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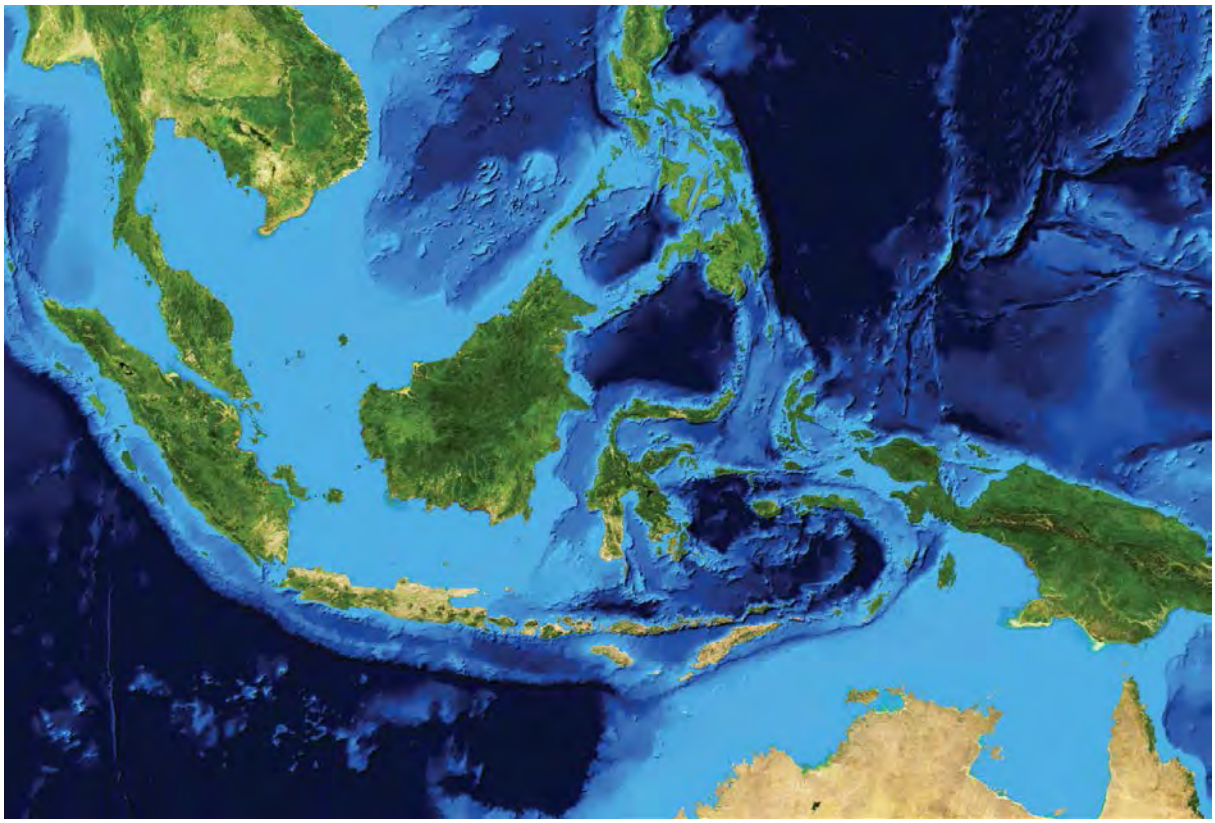

INDONESIA BIODIVERSITY AND TROPICAL FORESTRY ASSESSMENT (FAA 118/119)

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Prepared for **USAID/Indonesia Environment Office**

Prepared by **Chemonics International Inc.**

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Disclaimer

Data in this assessment were sourced primarily from publicly available global datasets and therefore has inherent limitations in terms of accuracy, location, and time period. Data illustrated in tables and charts do not necessarily reflect the views of the United States Agency for International Development or the U.S. government.

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ACRONYMS

AMDAL	environmental and social impact assessment
ASEAN	Association of Southeast Asian Nations
BAP	special allocation funds
BAPPEDA	Provincial Planning Agency
CIFOR	Center for International Forestry Research
CMEA	Coordinating Ministry for Economic Affairs
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CSO	civil society organization
CTI	Coral Triangle Initiative
DFID	U.K. Department for International Development
DKP	Ministry of Marine and Fisheries
EPA	Environment Protection Agency
EU-FLEGT	European Union - Forest Law Enforcement and Governance and Trade
FAA	U.S. Foreign Assistance Act
FAO	Food and Agriculture Organization of the United Nations
FFI	Fauna & Flora International
GIS	geographic information system
GiZ	German Society for International Cooperation
HNSI	Indonesian Fisherman Association
ICNL	International Center for Not-for-Profit Law Research Center
IBSAP	Indonesian National Biodiversity Strategy and Action Plan
IFACS	Indonesian Forest and Climate Support
IMACS	Indonesian Marine and Climate Support
IUCN	International Union for Conservation of Nature
IUWASH	Indonesian Urban Water, Sanitation, and Hygiene
KEHATI	Indonesian Biodiversity Foundation
MMAF	Ministry of Marine Affairs and Fisheries
MOF	Ministry of Forestry
MOHA	Ministry of Home Affairs
MPA	marine protected area
MPAG	Marine Protected Areas Governance
MP3EI	Master Plan: Acceleration and Expansion of Indonesia Economic Development 2011-2025
NGO	nongovernmental organization
NOAA	National Oceanic and Atmospheric Administration
OTSUS	special autonomy law
PES	payment for ecosystem (environmental) services
REDD+	Reducing Emissions from Deforestation and Forest Degradation
TFCA	Tropical Forest Conservation Act
TNC	The Nature Conservancy
UN	United Nations
UNDP	United Nations Development Programme
UNODC	United Nations Office on Drugs and Crime

USFS	U.S. Forest Service
WALHI	Friends of the Earth Indonesia
WEPA	Water Environment Partnership in Asia
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

Indonesia is one of the richest biological countries in the world. It is one of six Asian countries — China, India, Indonesia, Malaysia, Papua New Guinea, and the Philippines — that are among 17 "mega-diverse" countries that together contain 70 percent of the world's biodiversity (Conservation International 1998). Although Indonesia still contains a significant amount of the world's rich biological heritage with some of the highest diversities in mammals, corals, and fish species, its biodiversity is being lost at an unprecedented rate. It is not surprising that Indonesia is designated as a biodiversity hotspot — an area of high terrestrial biodiversity that is under significant threat from human activity. This is an indicator of the country's biodiversity crisis with its iconic species, such as rhinoceros and orangutans, becoming rare and endangered.

Looking to the future, Indonesia's biodiversity crisis will deepen. Indonesia is poised to undergo transformational change to achieve its ambitious economic growth targets; become one of the top 10 economies in the world by 2025 and in the top six by 2050. Implicit in Indonesia's economic development master plan — Acceleration and Expansion of Indonesia Economic Development 2011-2025 — is the assumption that to achieve its ambitious growth targets, the current trend of conversion of natural forests to plantations and mines, overfishing of its oceans, and conversion of coastal areas to farms, ports, and resorts will need to continue. If so, the result will be an irredeemable degradation of Indonesia's natural ecosystems and undermining of its future economic stability. Indonesia's current environmental policies, enforcement mechanisms, and political commitment are ill equipped to meet the challenge of maintaining its biodiversity, forests, and marine resources during its projected rapid economic development with its rising demand for natural resources, energy, new infrastructure, and expanded industrial agriculture.

Since the previous Indonesia Biodiversity and Tropical Forest Assessment in 2008, there have been numerous changes in the USAID/Indonesia environment program that attempt to keep pace with socio economic and political realities and provide a strengthened commitment to donor coordination. USAID/Indonesia has been working to strengthen strategic partnerships with government institutions and ministries, nongovernmental organizations (NGOs), and other donors. Working with other U.S. government partners such as the National Oceanic and Atmospheric Administration (NOAA), the U.S. Forest Service (USFS), and contracted projects like Marine Protected Areas Governance (MPAG), Indonesian Marine and Climate Support (IMACS), and Indonesian Forest and Climate Support (IFACS), this assessment found important and significant progress at national, regional, and local levels anchored in specific actions to improve stewardship of the country's biodiversity and tropical forest conservation. Recommendations in this report reflect this momentum and underscore elements that can be used to advance and improve these partnerships.

Technical assistance abounds at every level and in every corner of the country. Donors and NGOs (domestic and international) and other civic society groups are perhaps more numerous, more active, and more diverse than in any single country around the globe. USAID and the U.S. government have worked hard in the past decade within the country and also from Washington, D.C. to provide assistance and advice aimed at helping Indonesia to improve policies, laws, and activities to benefit Indonesia's natural environment and enhance the livelihood of its people to

help them adapt and be better prepared for events that are already occurring as the earth's climate changes. Their coordination with other donors in these areas is mostly visible at the national level; it is especially laudable in its efforts to mitigate climate change, promote the Blue Economy, support Reducing Emissions from Deforestation and Forest Degradation (REDD+) initiatives, and help coordinate and develop OneMap.

Contracted projects have worked with USAID to coordinate with other donors in areas such as informational coordination meetings on Papua development activities and with the Coral Triangle Initiative (CTI). However, the assessment team, although only having an opportunity to visit a sample of sites, found in discussions with key stakeholders that little if any coordination and information exchange was occurring with other donor projects at the regional and/or district level. A significant exception was cooperation between USAID IFACS and the Australian Agency for International Development project in Central Kalimantan.

More opportunities exist for donors to leverage their experience and funding so that the end results are more effective and wide-reaching. In upcoming evaluations of USAID/Indonesia's major environment programs, this should be one area that evaluators explore. Another area to examine is the effectiveness and avenues of communication that district technical *dinas*' (agency/agencies) have with the Ministry of Home Affairs (MOHA) and their counterparts at the national level. If experiences and lessons gained at the district level are to be sustained and capitalized on, there has to be an efficient and systematic process that feeds into the national perspective. Too often with donor-sponsored programs, the information flows to a decentralized audience, and donor projects are the primary eyes, ears, and advertisers of results.

This Indonesia Biodiversity and Tropical Forest Assessment was conducted for USAID's Indonesia mission to summarize the status and threats to species and natural ecosystems in Indonesia, identify the actions necessary to conserve biodiversity and tropical forestry in Indonesia, analyze the extent to which USAID/Indonesia is addressing the actions necessary, and provide recommendations for development programming. This assessment fulfills the requirements of Sections 118 and 119 of the U.S. Foreign Assistance Act (FAA), which requires USAID to analyze and address threats to tropical forests and biodiversity. It also aims to inform development of USAID/Indonesia's new five-year country development cooperation strategy.

Stakeholder meetings with more than 100 individuals and 50 organizations were held in East Nusa Tenggara, Papua, Southeast Sulawesi, Aceh Tenggara, Gayo Lues, and East Kalimantan, as well as in Jakarta. The assessment identified the status, trends, and threats to biodiversity primarily for two major ecosystem types — terrestrial and marine — to ensure that their unique considerations were taken into account

A. Status of Biodiversity and Forests in Asia

Indonesia is extremely rich in biodiversity. The country straddles two of the world's seven major bio-geographic regions — the Oriental and Australasian — and includes Wallacea, a unique biotic and geographic area that lies in the interface between the two bio-geographical regions. Additionally, it is in the wet tropics and has many islands (28 of its 17,493 are considered main islands) and a complex geological history. Therefore, Indonesia has been identified by all recent international conservation priority-setting exercises as a global priority for actions to conserve

biodiversity. Conservation of its forests has assumed global importance for climate change. Indonesia's deforestation rates were until recently the highest in the world. The conversion from forest to industrial plantations, such as palm oil, especially in its peat lands, is the primary cause of Indonesia being ranked third globally in carbon emissions, after the United States and China.

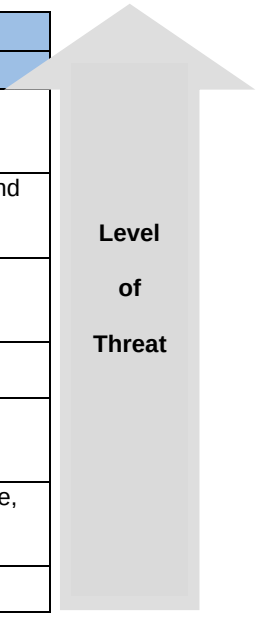
Indonesia's biodiversity and forests also underpin its sustainable economic growth and provide a wide range of ecosystem goods and services, such as climate regulation, flood and drought control, consistent water supply, carbon sequestration and other services that are globally estimated to be worth trillions of dollars annually. Nonetheless, a finding of this report is that the contribution of natural ecosystems is commonly undervalued or not considered in Indonesia's economic policies and planning. If this continues, its ecosystems will be further degraded, habitats lost, more species threatened with extinction, and long-term sustainable development will be undermined. Conservation of Indonesia's biodiversity and forests will require actions that encompass the government, private sector, and civil society.

B. Direct Threats

Based on past trends and looking to the future, the most significant direct threats to biodiversity and tropical forests are the conversion of natural ecosystems for commercial agriculture and aquaculture; unsustainable harvesting of forest, freshwater and marine resources, mining; and in the long term, climate change. Climate change is considered a direct threat because it will not only be a multiplier of existing environmental pressures, but also give rise to new pressures for all ecosystems in the country.

Exhibit 1. Direct Threats to Biodiversity and Forests in Indonesia

Natural Ecosystems	
Terrestrial	**Marine**
Conversion of forests into agriculture (e.g., oil palm, rubber, timber plantations, encroachment)	**Overharvesting and destructive fishing**, including illegal, unreported, and unregulated fishing
Mining extraction and exploration	**Conversion and degradation** of mangroves and other coastal habitats (e.g., aquaculture, resort development)
Unsustainable logging, especially industrial-scale (and illegal)	**Climate change** (e.g., sea level rise, tropical storms, increasing sea surface temperatures, ocean acidification)
Infrastructure development (e.g., roads, dams, pipelines)	**Mining extraction and exploration**
Climate change (e.g., habitat modification, alteration of rainfall patterns and temperatures, forest fires, outbreaks of pests)	**Infrastructure development** (e.g., harbors, transport)
Wildlife trade/trafficking	**Pollution** (e.g., municipal and ship ballast waste, oil spills, chemical and thermal pollution from industry, agricultural runoff)
Invasive species	**Wildlife trade /trafficking**



C. Indirect Threats and Actions Necessary to Conserve Biodiversity and Forests

Although direct threats focus on changes to ecosystem processes (e.g., habitat change, fragmentation, or loss; overexploitation; and climate change), indirect threats focus on

underlying factors — social, economic, political, institutional, or cultural — that enable or add to the occurrence or persistence of direct threats and have a negative effect on biodiversity and forest conservation. Addressing indirect threats can influence the impact of direct threats.

One of the most significant indirect threats, for example, is poor governance, e.g., inadequate coordination, conflicting policies and regulations, and corruption that prevents enforcement. Strengthening governance through actions such as improving coordination and enforcement of laws and regulations, improving transparency, and addressing corruption can mitigate the impact of direct threats such as land conversion and infrastructure development. In Indonesia, these underlying factors can provide opportunities for engagement and to have a positive tangible effect. Decentralization, for example, can have a negative effect (e.g., through inadequate consideration of environment in granting concessions) or a positive one (e.g., through rigorous planning and monitoring and land-use planning that favors conservation and investments in improving natural resource management). In the process of preparing this assessment and in stakeholder consultations, nine indirect threats were identified, with links to the direct threats, actions necessary, and recommendations. These nine indirect threats can be clustered into three major factors: governance, incentives and business practices, and capacity, resources, and data (see Exhibit 2 below).

D. Extent to which USAID/Indonesia is Addressing the Actions Necessary

This report summarizes USAID/Indonesia's programs and the extent to which the efforts being undertaken by the mission meet the actions necessary, looking across its entire programming portfolio. In brief, the assessment found that the mission and U.S. government agencies such as the U.S. Forest Service and the Department of Justice are to some degree addressing actions in strengthening the capacity of district planning, enforcement, use of geospatial, and private sector engagement in its current and recent biodiversity and environment programs. Looking to the future, some key gaps in USAID/Indonesia's current biodiversity programming exist, however, especially in valuation of ecosystem services and promotion of certification and public awareness of the importance of biodiversity and natural ecosystem services.

E. Recommendations

Based on findings of this assessment, the following illustrative recommendations are presented for how USAID/Indonesia can strategically and effectively address the actions necessary to conserve biodiversity and tropical forest in Indonesia. These recommendations focus on key underlying factors — weak governance and enforcement, perverse incentives and poor business practices, and inadequate capacity, resources and information — that are supporting the degradation and destruction of Indonesia's rich biological heritage. If the purpose of the environmental program of USAID is to conserve biodiversity, marine and forest resources, the recommendation is to focus on areas of high conservation value that are or will soon be experiencing pressure from direct threats such as conversion from forest to industrial agriculture, unsustainable logging, overharvesting, and infrastructure development.

The recommendations are presented as *higher priority* and *priority* — the higher priority being designated as interventions that have the potential for the greatest impact in conserving

Indonesia's biodiversity and forests by addressing the key underlying causes of environmental loss and degradation and contributing to conservation of high biodiversity and forest value areas.

Exhibit 2. Indirect Threats, Direct Threats, and Recommendations

Indirect Threats		Links to Direct Threats	Recommendations
Governance	**Inadequate coordination and overlapping jurisdictions** to protect high conservation value habitats.	Conversion (agriculture and aquaculture) Mining	**Higher priority** • *Strengthen local governance (district):* two-pronged approach: facilitate development of guidelines for districts on environmental management (Ministry of Home Affairs) with technical assistance by ministries of forestry, environment, maritime affairs, and fisheries; pilot guideline adoption at the district level
	Corruption and weak enforcement of laws, policies, and agreements related to natural resources.	Overharvesting Unsustainable logging Conversion Ilegal mining Illegal fishing Destructive fishing	**Higher priority** • *Governance and the rule of law:* build on past and current initiatives to strengthen capacity for enforcement in surveillance, bringing to justice, and compliance; support compliance with new laws at district and provincial levels to promote compliance by plantation companies **Priority** • *Wildlife trafficking:* promote full implementation of existing legal procedures, increased accountability, and educating/awareness of importance of biodiversity
Incentives and Business Practices	**Business practices are skewed or do not adequately consider** the full range of social and environmental impact.	Pollution Conversion Mining Unsustainable logging	**Priority** • *Stimulate public-private partnerships for conservation:* encourage private sector to adopt best practices and use strong social and environmental safeguards • *Vulnerable populations: support local rights to resources* and promote more community-based approaches, ensure that vulnerable populations, such as in Papua, have access to benefits, supported by rights and tolls to sustainably use them
	"Misguided" incentives and an undervaluation of goods and services provided by healthy ecosystems.	Conversion Pollution Overharvesting Mining Infrastructure development	**Priority** • *Agriculture and food security: promote and facilitate awareness and action to hinder the conversion of natural ecosystems*, especially high conservation value, to commercial plantations and aquaculture (including USAID programs) • *Raise awareness and improve communication* about the importance of ecosystem services, biodiversity, and forests to stimulate greater local and national ownership
	Demand for unsustainably sourced food, natural resources, energy, and consumer products.	Overharvesting Development of hydropower Conversion Unsustainable logging	**Priority** • *Stimulate public-private partnerships for conservation:* encourage voluntary private sector certification initiatives; support and stimulate pro-conservation business ventures (ecotourism, PES) • *Raise awareness and improve communication* about the importance of ecosystem services, biodiversity, and forests to stimulate greater local and national ownership

	Indirect Threats	Links to Direct Threats	Recommendations
Capacity, Resources, and Data	**Development plans and priorities (medium and long terms) do not adequately consider ecosystem services** (forests and biodiversity).	Conversion Infrastructure development Mining Climate change	**Higher priority** • *Climate change, conservation and rights:* support conservation of biodiversity and natural forests, not just carbon, in REDD+ programs **Priority** • *Mainstream climate change across the mission's portfolio*: develop activities that will help communities adapt to climate change *Collaborative activity: (leverage influence and resources)* • *ASEAN: develop a comprehensive strategy* that will encourage eco-friendly policies and practices in Indonesia (especially for major industrial crops) • *Blue Economy activities:* expand support of IMACS and future marine conservation activities to support Indonesia's Blue Economy
	Inadequate capacity at district level for development planning and management of natural resources.	Conversion Overharvesting Mining Infrastructure development	**Higher priority** • *Strengthen local governance (district):* two-pronged approach: facilitate development of guidelines for districts on environmental management (Ministry of Home Affairs) with technical assistance by ministries of forestry, environment, maritime affairs, and fisheries; pilot the guideline adoption at the district level **Priority** • *Invest in systematic geospatial mapping and monitoring:* ensure there is a trained cadre at provincial and district levels that can use geospatial data and indicators on a daily basis
	Insufficient resources for natural resource and biodiversity conservation.	Conversion Mining Overharvesting Pollution	**Priority** • *Strengthen support to marine and fisheries conservation:* build on achievements and lessons learned under IMACS and MPAG, use best practices, and harmonize policies; develop new initiatives and strengthen collaboration between MMAF and CTI to share information, promote research, and improve modeling *Collaborative activity (leveraging resources)* • *Coral Triangle Initiative: continue to strategically support emerging governance systems* and deepen connections in generation of policies, information, and networks and improving governance
	Weak/non-existent data coupled with uncoordinated analyses and research systems needed for understanding resources, priority setting, and effective policy-making/decision-making.	Overharvesting Mining Conversion Climate change Pollution Unsustainable logging	**Priority** • *Invest in systematic geospatial mapping and monitoring:* build on U.S. government support for OneMap to improve monitoring of biodiversity threats and national development trends and expand to include data and indicators related to health, economic growth, governance, climate change, etc. • *Environmental education and research*: enhance environmental studies; importance of biodiversity for healthy ecosystems and sustainable development; integration of environment into development planning, valuation of ecosystem service

Higher Priorities:

Governance: underpinning success and failure. The main biodiversity conservation and natural resource management challenges are fundamentally the result of governance issues. It is the ineffective governance arrangements that fuel environmental degradation, marginalize local communities, and lead to conflicts over resources. This lack of recognition of the value of services provided by healthy ecosystems is reflected in weak enforcement of environmental policies, legislation, and regulations. National policies and regulations are adequate for conservation, but are not enforced. Effective environmental governance is further complicated by decentralization of natural resource management to district governments which commonly lack capacity in spatial planning and sustainable resource management as well as having little appreciation of the importance of biodiversity and forests for sustainable development. Running counter to effective local management is the perverse incentive created from generation of revenue by issuing permits and licenses, which is fueling expansion of commercial agriculture and mining at the expense of forest and marine resources.

Two priority recommendations to improve governance by enhancing current and initiating new activities:

- *Strengthen governance and the rule of law.* The mission's current portfolio has numerous projects addressing fundamental governance issues of biodiversity conservation. The recommendation is to build on the mission's current projects and continue to seek opportunities for strengthening enforcement of biodiversity and forest laws and regulations at the national, provincial, and district levels. These opportunities and actions include capacity building in surveillance, bringing to justice those engaged in illegal activities, and promoting compliance (e.g., environmental impact assessments, fines). The mission should identify laws and regulations that have the potential for the greatest impact in conserving biodiversity and forests and support their promotion and enforcement. For example, with conversion of forests into commercial agricultural plantations and estates being a major cause of deforestation and loss of habitat for flagship species, the mission can support enforcement of new laws such as Law 32/ 2009 to further compliance by plantation companies.

- *Strengthen local governance (district).* A finding of the assessment is the growing importance of district-level government in natural resource management. As noted in this report, decentralization has resulted in districts being responsible for local development planning, licensing concessions, and monitoring, often without the technical capacity, knowledge of policies and regulation, and resources necessary for effective management. A two-pronged strategy to strengthen district capacity is recommended:

  - Facilitate development of guidelines for districts on environmental management, planning, monitoring, and compliance by the Ministry of Home Affairs, with technical assistance by the ministries of forestry, environment, maritime affairs, and fisheries.
  - Pilot adoption of the guidelines targeting districts in key high-biodiversity areas, such as Papua and the marine/coastal areas surrounding West Papua, to build capacity and facilitate conservation and sustainable use of natural resources.

Experience gained with IFACS at the district and provincial levels can help guide and better target these approaches.

- *Climate change, conservation, and rights.* Forest-based carbon emissions is the leading source of Indonesia emissions, and current climate change mitigation efforts have primarily focused on halting the conversion of forests to agriculture plantations and estates, especially in the peat land areas. Although the lowering of forest-based emissions is needed, there is a concern that forest carbon projects will focus too narrowly on carbon and not pay adequate attention to the forests, biodiversity, and people.

  A potential role for USAID could be to ensure that REDD+ or voluntary forest carbon programs support conservation of biodiversity and natural forests, not only carbon. Another potential activity would be to support and promote free, prior, and informed consent not only in REDD+, but also in other natural resource-focused initiatives, such as local coastal development and mining, both of which will be sharply expanding in high conservation value areas in Papua and Sumatra.

Priority Recommendations for Other Program Areas:

Strengthen synergies, collaboration, and integration to ensure that conservation and sustainable management are incorporated through the mission's programs. Illustrative areas of cross-sectoral activities could include:

- *Environmental education and research.* An often-heard concern is about the relatively weak environmental curriculum and relevant research. The mission has developed good links with Indonesian universities through its current marine portfolio and is engaged in activities through other U.S. government interventions in areas such as geographic information system (GIS) spatial planning and climate change research and analysis. In the Partnership for Enhanced Engagement in Research project, for example, USAID, in partnership with the USAID/Office of Science and Technology and the National Science Foundation is providing funding for Indonesian scientists to work with foundation-funded researchers. The mission could build on these current interventions to enhance environmental studies, strengthening university curriculum and supporting other capacity building opportunities (e.g., short-term professional training). For the development of new initiatives in environmental education and research, it is recommended that a needs assignment be conducted that identifies current environmental education and research gaps and considers specific areas that the mission should support.

- *Vulnerable populations.* It is no coincidence that Indonesia's remaining forests overlap with ethnic minorities. There is a real need to support local rights to resources, promote more community-based approaches to natural resource management, and ensure that vulnerable populations in biodiversity-rich areas such as Papua have access to the benefits of these resources, supported by rights and tools to sustainably use them. With the increasing government focus on Papua as the last frontier with rich resources ripe for exploitation, interventions can be implemented at the national level to build support for strengthening

local rights and at the local level to build capacity and understanding of rights, legal procedures, and enforcement.

Gender is of special concern. Indonesia is lagging behind other ASEAN countries in gender equality. The conversion of forests to plantations has a disproportionate impact on women, as changes in the availabiilty of resources commonly found in forests force women to go further distances for food gathered from the forest and fuel, undermining household food security. Women play a crucial role in coastal resource management, and marine degradation adversely affects women's health and livelihood. It is recommended that the gender analysis that the mission undertakes includes indicative priority geographic areas with an analysis of resource-dependent activities and roles, access to and control over resources, and suggestons as to how to close gaps between what women and men need and what development initiatives can deliver.

- *Agriculture and food security.* Agricultural expansion that results in land conversion from forest to field is a major threat to Indonesia's biodiversity and forests. In particular, conversion of natural ecosystems to commercial monoculture plantations of oil palm, rubber, pulp trees, shrimp farms, and other crops is having a significant impact on the country's biodiversity and forests, particularly in high conservation value landscapes. With awareness of this threat to biodiversity and forests, efforts to promote food security should include appropriate biodiversity considerations in policies and decision-making. Indicative activities include promoting biodiversity and environmental and social safeguards; working to ensure that agricultural policies and interventions, especially large-scale commercial crops, do not continue to degrade and destroy natural habitats and areas of high conservation value; and supporting enforcement of environment impact assessments (such as required by Law 32/2009).

- *Wildlife trafficking.* Indonesia's importance in the wildlife trade and the impact of wildlife trafficking on local biodiversity and its revenue contribution to criminal cartels support a recommendation for further engagement. As noted, development pressures in areas of high biodiversity value, especially those that are home to flagship species such as orangutans and tigers, will hasten habitat degradation and destruction and encourage wildlife trafficking. The USAID Changes for Justice project is already working extensively with the Attorney General's Office General Crimes Division; forest crimes such as wildlife trafficking are under its authority. Recommended activities include the Changes for Justice approach to combat loss of forests and biodiversity by promoting full implementation of existing legal processes and increased accountability of local prosecutors' offices and courts by educating local prosecutors and judges on the importance of biodiversity and the impact of its loss on the environment and local indigenous populations; informing local organizations how to effectively file and/or monitor cases; and putting guidelines and processes in place that will result in reduction of deforestation, conversion, and loss of wildlife. Activities such as this can be linked to regional initiatives, such as USAID's Regional Development Mission for Asia support for the Association of Southeast Asian Nations - Wildlife Enforcement Network and the recently awarded Wildlife Trafficking Response, Assessment and Priority Setting program.

Strengthening strategic partnerships with key national and regional organizations and initiatives. Illustrative activities could include:

- *ASEAN.* In collaboration with the Regional Development Mission for Asia and other missions in the region, USAID/Indonesia should consider developing a comprehensive strategy to increase collaboration and coordination with ASEAN in areas related to economic growth, biodiversity and natural resources, and climate change, and promote strengthening of environmental standards, compliance, and enforcement that will encourage eco-friendly policies and practices in Indonesia, especially for major industrial crops such as oil palm, rubber, and cocoa.

- *Coral Triangle Initiative.* Through this key initiative addressing critical biodiversity and climate change issues, the mission should continue to strategically support emerging governance systems and develop broader connections. The activities and lessons learned from USAID IMACS and MPAG have direct relevance to CTI, especially in generation of information, policies, and networks, as well as processes to hinder corruption and promote transparency. The Indonesia National Plan of Actions for the CTI designates priority seascapes and its goals include applying an ecosystems approach to fisheries management, improving marine protected area management, and developing and implementing an early action climate adaptation plan for the near shore marine and coastal environment. The recommendations to the mission for marine activities include supporting and aligning with these priority goals.

- *Blue Economy activities.* There are significant opportunities to expand the current work of IMACS with its support of Indonesia's Blue Economy to forge stronger cross-sector ties in the country. USAID can use these experiences and those of MPAG and the Coral Triangle Initiative to foster more dynamic regional links and with neighboring countries through Blue Economy endeavors.

Thematic recommendations. Enhance current and initiate new activities to:

- *Stimulate public-private partnerships for conservation.* The private sector is playing a major role in transforming Indonesia's natural landscape. Private sector investments are converting forestlands to industrial agricultural plantations, extracting petroleum, natural gas and minerals, and expanding infrastructure, trade, and connectivity within Indonesia and across the region. Adoption of sustainability standards by the private sector will have a significant positive impact on conversion of biodiversity and forest resources, USAID/Indonesia should consider strengthening its strategic engagement with the private sector to encourage best practices. This could include voluntary private sector certification initiatives (e.g., for timber, oil palm, fisheries), complying with regulations such as Environmental Management Law 32/2009, supporting and stimulating pro-conservation business ventures (e.g., ecotourism, payments for ecosystem services), and other forms of partnerships for conservation, such as partnerships with terrestrial and marine protected areas.

- *Mainstream climate change across the mission's portfolio*. Climate change is already having a wide-ranging impact, and development programming needs to consider future scenarios to

enhance the sustainability of investments. The mission can build on current efforts to assess potential climate impact and integrate these considerations into all sectors, for example, REDD+ and food security, and support a shift in focus in programs such as REDD+ to broader environment and social concerns. The adaptive management activities that the mission has already supported at the district level have brought new levels of understanding to government officials, NGOs, academia, and media representatives who participated and by doing so helped them better understand the connectedness of the resources they rely on. The mission should seek broader avenues for similar activities that can help more communities adapt more widely to the changes.

- *Strengthen support for marine and fisheries conservation*. Indonesia's people rely on fisheries as their main source of protein. Recognizing the critical connections among biodiversity, climate change adaptation, food security, governance, and health, an integrated approach is needed to conserve fisheries and endangered aquatic species with an eye toward those who migrate across international waters. This approach should build on achievements and lessons learned under IMACS and MPAG, use best practices, and harmonize policies among policy-makers and practitioners in Indonesia and the region. It should continue working to improve licensing, reduce the number of fishing vessels, improve data being collected and monitored, and continue to assist the ministry in adhering to international conventions, putting observers on boats, and adopting systems that improve profitability. Experience gained with USAID's Coral Triangle Support Partnership and MPAG's collaboration with the MMAF can help develop new initiatives that strengthen collaboration between the ministry and the Coral Triangle Initiative to share information, promote research, and improve modeling. The selection of a geographic focus for activities should consider areas of high conservation value such as the priority areas designated by the MMAF and the CTI Plan of Action and the continuation of the IMACS approach in current and new sites.

- *Invest in systematic geospatial mapping and monitoring*. Strengthening national, provincial, and district strategic planning and programming by facilitating access, capacity development, and implementation of geospatial mapping would be a significant contribution to enhancing environmental management. Building on U.S. government support for development of the National Mapping Agency's OneMap can help improve the understanding and monitoring of biodiversity threats and national development trends and could be expanded to include geospatial data and indicators related to health (e.g., malaria distribution, emerging pandemic threats), economic growth (e.g., poverty, income), governance, food security, social indicators, environment, climate change, disasters, and other relevant information. Of equal importance is helping to ensure that these initiatives result in a trained cadre at the provincial and district levels that can effectively use this information on a daily basis.

- *Raise awareness and improve communication about the importance of ecosystem services, biodiversity, and forests to stimulate greater local and national ownership and political will*. Economic growth remains the top priority of the Indonesian government and the private sector, but continued degradation of natural ecosystems threatens to undermine prospects for sustained future growth. Awareness of the importance of healthy ecosystems and biodiversity for economic development needs to be raised and political will mobilized to stimulate action and ownership. The mission can facilitate this by supporting multi-stakeholder engagement

in district, provincial, and national planning and monitoring, as it has done in several instances with its IMACS and IFACS programming. The mission can also catalyze and facilitate action and ownership through broad-based strategic partnerships with other efforts and organizations, such as local and international organizations, such as the Indonesian Biodiversity Foundation (KEHATI) and the Nature Conservancy (TNC), ASEAN Center for Biodiversity, the ASEAN and South Asia Wildlife Enforcement Networks, community organizations, and journalists. These efforts could lead to a more systematic monitoring of national biodiversity status and trends and more effective communication of these concerns to inform and stimulate proactive responses.

I. INTRODUCTION

A. Purpose of the Assessment

The U.S. Foreign Assistance Act, which authorizes bilateral foreign assistance programs, requires that tropical forestry and biodiversity assessments be conducted in conjunction with development of new foreign assistance strategies and programs. The purposes of this legal requirement are to ensure that U.S. foreign aid does not support activities that harm the tropical forests and biodiversity of host countries and to inform USAID strategic planning and find ways to support host countries to sustainably use and conserve their tropical forests and biodiversity. Regarding tropical forests and biodiversity, Foreign Assistance Act (FAA) Sections 118 and 119 (Annex A) state:

> *Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of the actions necessary in that country to conserve tropical forests and biological diversity, and the extent to which the actions proposed for support by the Agency meet the needs thus identified.*

The intent of the U.S. Congress in passing these amendments was not to support conservation of biological diversity and tropical forests for their own sake, but to support their conservation because of the belief that they are the foundation for the long-term, sustainable social and economic well-being of any country.

USAID/Indonesia conducted its last FAA 118/119 Assessment in 2008 (USAID 2008) as an update to a comprehensive analysis completed in 2004 (USAID 2004). Since the 2008 assessment, Indonesia's political and social fabric has continued to stabilize and strengthened. Indonesia's economy continues to surge and is one of the strongest in the region in terms of sustained growth. The USAID mission in Indonesia is once again on the threshold of its next five-year planning period. In the statement of work for this assessment (Annex B) the mission requested not only an update of the previous assessment to fulfill the legal requirements of the FAA, but also for help in putting its new 2014-2018 Country Development Cooperation Strategy into a broader environmental context. It requested guidance in identifying biodiversity and tropical forest conservation issues and options that it can consider as well as suggesting further analyses that are needed to help guide these choices.

USAID/Indonesia, in its in-briefing with the assessment team, noted that all of the mission's current contracts were scheduled to end in 2014, which offered an exceptional opportunity to add a fresh perspective. The team was invited to contribute to new and different approaches and to provide recommendations with a long-term (10, 15, 20 years) view in mind.

B. Methodology

This assessment was conducted from September through early November 2012 by a four-person team led by an international consultant (Steve Dennison, an independent natural resources and biodiversity specialist) and three local independent consultants (Sovia Purba, an institutional and

policy specialist; Barita Manullang, a terrestrial biodiversity specialist; and Puji Antono, a coastal and marine management specialist). The team worked with USAID/Indonesia's H. Olivia Ahn, natural resources officer, on preparation and work plan for the assessment and in coordination for meetings with other USAID/Indonesia staff. Ms. Ahn also accompanied the team on three of its four site visits. Two technical specialists from USAID's E3 Bureau, Hannah Fairbank (biodiversity and natural resources advisor) and Richard Volk (water, marine and coastal management advisor) were also present during the assessment team's first week and helped frame the approach and provided guidance on selection of the sites for field visits. Mr. Volk also travelled to one of the marine sites in Berau, East Kalimantan and provided the team with his observations. Katherine Warner, Chemonics' project management unit director for this assessment, also provided key insights and technical contributions for the initial and final drafts of this report.

The assessment team reviewed background literature and project documents. It conducted in-person interviews with government technical specialists and leaders, NGOs, community organizations, farmers, fisher folk, environment researchers and academicians, donor organizations, project and USAID sector specialists in environment, governance and health, and private sector representatives. During the seven-week in-country visit, five field trips were also made within a four-and-a-half-week span to view project-related activities and conduct interviews with a broad range of stakeholders at each site. In addition to the marine site noted above, two other marine/coastal sites were visited by the team in Kupang, Nusa Tenggara Timur and Kendari in Sulawesi Tenggara. A fourth site visit focused on Papua, specifically the area around Jayapura and the Cyclops Mountains, and also a rapid visit to the mangrove area south of Timika on the south coast of the province. The team's final field visit included the Alas Valley and the Leuser Ecosystem area in the regencies (districts) of Aceh Tenggara and Gayo Lues in Aceh Province, northern Sumatra. Annex C provides a list of people met and interviewed during the assessment.

Before and in between field visits, the team continued its document review and conducted interviews with Jakarta-based stakeholders. During the final in-country week, an oral debriefing and written summary was provided to USAID/Indonesia. Using their initial comments, the team completed the draft of the report. The final report was drafted following receipt of comments from reviewers.

C. Report Structure

Following this introduction, the report is presented in eight additional sections. These begin with Section II providing summary points and an update of information presented in the two previous assessments (USAID 2004, USAID 2008). These two documents provided significant background and baseline information that remains relevant today. The composition of the forest estate, species inhabiting these forests, breadth of terrestrial and marine biodiversity contained within these ecosystems, and hotspots identified for continued surveillance and attention are essentially unchanged five years later. And the urgency to protect and conserve threatened species, habitats, and landscapes is still present. (This report provides essential data on these numbers important to biodiversity and forest resources of Indonesia.) Rather than reiterate data presented in the previous two reports, this document highlights significant trends and differences that have occurred, or in the judgment of the assessment team, appear to be occurring.

As stipulated by law, this document contains sections that identify primary and indirect threats to biodiversity and tropical forests in Indonesia. It provides the socio-economic setting, highlights important changes since the last assessment and examines important drivers that provide the context in which important changes are occurring. Institutions and policy affecting biodiversity are also discussed, along with laws and legislation that have had or are having an impact on natural resource use, the environment, biodiversity, and Indonesia's forests. The report also summarizes activities by donors, NGOs, and others that are helping to address the threats identified. Section V provides an examination of actions necessary to conserve terrestrial and marine diversity and Indonesia's tropical forests. This is followed by a discussion on USAID/Indonesia's current programming with its links to environment/tropical forests and biodiversity and discusses the extent to which the U.S. government's actions are addressing needs identified to conserve Indonesia's forests and biodiversity.

The assessment concludes with recommendations that USAID/Indonesia can examine and consider as it develops its new Country Development Cooperation Strategy. A reference section is provided, as well annexes that contain additional background, details about Indonesia's protected areas, international environmental conventions and protocols it is a signatory to, maps, International Union for Conservation of Nature (IUCN) Red List species, and other data that complement the text.

II. BIODIVERSITY AND TROPICAL FORESTS IN INDONESIA

A. Introduction

Indonesia consists of some 17,500 islands, of which about 990 are permanently inhabited. It is the world's largest archipelagic state, and its seas and oceans are as important to its natural integrity as its land resources. Its coastline, 95,000 kilometers, is second only to Canada's in extent, and its political boundaries stretch more than 5,000 kilometers east to west and 2,500 kilometers north to south. It shares sea and land boundaries with 10 other nations.

The country is home to 240 million people and is the fourth most populous country in the world. There is a huge cultural diversity within the populace; the government recognizes more than 300 ethnicities and nearly 750 distinct languages or dialects. Taken as a whole — or even at the level of one of its more important islands, such as Java, Sumatra, or Sulawesi — the country defies generalization.

The same can be said for its natural resource attributes. Indonesia is extremely rich in biodiversity. The country straddles two of the world's seven major bio-geographic regions — the Oriental and Australasian — and includes Wallacea, a unique biotic and geographic area that lies in the interface between the two bio-geographical regions. The Coral Triangle (see Maps 2 and 3 in Annex J), with its center in the middle of the Indonesian territory, is internationally recognized as one of the world's most important areas for marine biodiversity. The Coral Triangle Initiative (CTI), begun in the last decade, continues to add to the broad and diverse information on this biologically and economically important area. Indonesia's biological attributes are complemented by the fact that it is located in the wet tropics and has many islands (28 of its 17,493 are considered main islands) and a complex geological history. The country has been identified by many recent international conservation priority-setting exercises as a global priority for actions to conserve biodiversity. Details about its eco-regions, ecosystems, and important fauna and flora are well described in the initial (2004) assessment.

B. Forests and Terrestrial Biodiversity

According to the Food and Agriculture Organization of the United Nations (FAO), about 58 percent of Indonesia is forested — almost 90,000,000 hectares — although other sources often cite 120 million as the baseline figure (FAO 2009). Overall, this resource still represents about 10 percent of the world's remaining tropical forests. It is Asia's largest and the world's third-largest contiguous area of remaining tropical forests. More than 30 million people in Indonesia are directly dependent on forests.

Deforestation continues to be a major problem. Indonesia has one of the highest deforestation rates in the world, reaching a peak in 2003 of some 2.4 million hectares per year, roughly 2 percent per year (FAO 2009). Although deforestation, land conversion, and habitat destruction occur throughout the country, it is most critical in the peat and swamp forest areas of Sumatra, Kalimantan, and Papua. The remaining forests on these main islands are in the most remote and (until now) inaccessible areas: the remote, unpopulated, mountainous interior of Papua; the Heart

of Borneo, which includes the most remote areas of five Kalimantan provinces; and the long, high backbone of mountains that run the length of Sumatra.

Recent data suggest slight improvements in deforestation and degradation rates, probably as the result of the logging ban decreed in 2007 and fewer fires in the peat land areas of Sumatra and Kalimantan (Borneo). Although down from its peak, the deforestation rate is still estimated at more than 1.5 percent per year (ASEAN 2011). Accompanying this deforestation and land conversion is a significant fragmentation and loss of faunal habitat; pollution of freshwater, coastal zones, and atmosphere; and disruption of traditional livelihoods (Obidzinski 2012).

The "forest estate" covers 132.3 million hectares, or 71 percent of the total land area of the country. However, only about half of the forest estate is actually forested. Most — 83 million hectares — is found in Kalimantan (41 million hectares) and Papua (42 million hectares), which together form what some consider the world's lungs for the carbon dioxide they remove and the oxygen they produce. Indonesia's forestland also includes swamp/peat forests that constitute about 12 percent of its total land area. (The 2008 report noted that this was also about 83 percent of all peat lands in Southeast Asia.) These forests not only sequester carbon on a daily basis from the atmosphere, they also sit atop vast quantities of carbon stored for millennia in the peat. It is also these lands, in addition to the deep peat areas in Riau Province in northern Sumatra that initiated the commitment of Indonesia with the Norwegian government (Brioch et al. 2011) to reducing greenhouse gas emissions as part of the reducing emissions from the Deforestation and Forest Degradation in Developing Countries Initiative..

The totality of the forest estate falls under the administrative purview of the central government's Ministry of Forestry (MOF). It has classified the extent of forest cover into five classes in the national forest estate and forest cover outside the national forest estate. Based on the ministry's 2011 data (see see tables in Annex D) the forest cover for Indonesia can be summarized as follows:

Exhibit 3. Permanent Forest Status	Area ('000 hectares)	Percent of Total
Conservation	20,094	11
Protection	31,595	17
Limited Production	22,344	12
Production	36,736	19
Conversion	22,745	12
Outside Areas	54,327	29
Total	187,841	100

Conservation lands include lands in the nation's protected area system (see the discussion below). This system follows IUCN's internationally recognized standards for sub-classifications. The MOF also manages a number of marine protected areas (MPAs), which are thought to be a part of the conservation area shown above. Areas under 'protection' status, noted in the above exhibit, are those lands that are often considered fragile or critical and include forest areas designated as essential to protect environmental services and as such, often harbor significant biodiversity. But these 'protection' status areas lack the safeguards given to conservation lands, which are also often found inside local district boundaries and even within production areas that support logging and mining concessions.

Limited production and production forest cover lands are those earmarked for commercial extraction of forest products and mining. Conversion lands are those designated to be converted to other uses, and it is this category where permits for oil palm, forest fiber/energy plantations, rubber, or other agricultural use may legally occur.

The outside areas are lands under the control of provinces, districts, and communities. In principle, use of these lands can also require a permit, but nominally, they need to be configured in the spatial plans for local governments.

It is the 77 million hectares of conversion and other area forestlands that are the most at risk of biodiversity loss and habitat destruction. Significant portions of protected area lands, which are infringed upon with greater regularity due to encroachment and illegal permitting practices and poaching, are also becoming more tenuous. In all, more than half of the forest cover land area of the country is at tremendous risk, and areas are often pillaged due to illegal permitting through conscious corrupt practices, out of ignorance of what is being transacted, or because of conflicting government policies. Deforestation rates (see Tables 2 and 3 in Annex D) appear to have slowed in the past several years due in part to a logging ban that has been instituted and nature's own generosity in sparing the country from the rampant fires of 10 years ago. Exhibit 4 shows one estimate on lands that does not include other areas or deforestation on conversion areas. (A more detailed comparison of deforestation can be found in Tables 2 and 3 in Annex D) Land clearing on conversion lands should also begin to slow, as there was a ban imposed at the end of 2011 related to Indonesia's commitment to REDD+ (Brioch et al. 2011). Permits for land conversion already issued, however, can legally be honored (see Section III).

Exhibit 4. Decreasing Trends in Forest Cover ('000 hectares)

	1990	2000	2005	2010
Forest Cover	118,545	99,409	97,857	94,432
Change Rate		-1914	-130	-685
Change Rate (%)		-1.75	-0.31	-0.71

Source: rainforests.mongabay.com, accessed November 7, 2012.

A recent study of three sites in the provinces of West Papua, Papua, and West Kalimantan provide interesting analyses of deforestation linked directly to oil palm estates (Obidzinski et al. 2012). Of the 3.5 million hectares of new oil palm plantation proposals submitted in 2009, 70 percent were in these three provinces. The provincial governor of Papua has actively supported the large-scale investments (see Section III), but it is also one of the country's flagship provinces tackling climate change; the governor actively promoted Papua's commitment to a low-carbon economy and limited forest conversion to plantation estates. Among the findings of the Obidzinski report (2012) for each of the sites was that the oil palm expansion occurred at the expense of forests 95 percent of the time. Stakeholder groups at each of the three sites were also surveyed to obtain their perspective on the environmental impact of the oil palm estates. They observed forest destruction and saw flash floods that led to declining water quality and quantity, natural drainage destruction that resulted in waterlogging, smog from fires during plantation establishment, soil erosion, worsening crop pests, and skin diseases. The destruction and degradation of the forest, from what is one of Indonesia's biggest economic activities, has larger

ramifications than just the removal of forest cover. Additional discussion of the trends of similar economic activities is found in Section IV and Tables 1-7 in Annex E.

With an estimated 80 percent of Indonesia's emissions come from land use changes/conversions — predominately in the forest sector — conservation of tropical forests and peat lands has been central to policy dialogue and associated development assistance since the last assessment. In discussions with USAID it was pointed out that the U.S. government has been actively engaged with the Indonesian government and other donors to help improve policies and structures that will mitigate climate change. The main focal points of these efforts have included 1) awareness-raising to elevate sustainable resource management in Indonesian national priorities, 2) Indonesian government restructuring to emphasize forest conservation in the context of REDD+, 3) improved planning for forest management with a REDD+ Strategy and a National Plan for Greenhouse Gas Reduction, 4) improved mapping of forest area (such as that noted above) to enforce a moratorium on conversion and to enable better management, and 5) strengthening provincial and district planning around the spatial planning process.

On another front, terrestrial species, predominantly forest dwellers, continue to be at great risk from their habitat loss and poaching. Land conversion and fragmentation make them more vulnerable to wildlife traffickers. Wildlife trading in Indonesia is known to be among the most insidious in the world (Templin 2012). It is difficult to measure and obtain reliable data, but incidents, which are but a fraction of what happens on a daily basis (Natusch and Lyons 2012), are reported almost daily by the region's media. Indonesia is known to be a major source of wildlife for the Asian pet market, for bush meat, inputs into traditional medicines, etc. Because of this porosity, it also serves as a major through point for wildlife trade originating in other parts of Asia and around the globe. Ministry of Forestry officials say the lack of coordination, staffing, and funding is largely responsible for the prevalence of illegal wildlife trade in the country (Squire 2011).

Illegally traded lizards (left to right): black tree monitor (Varanus beccarii), Reisinger's tree monitor (Varanus reisingeri), emerald monitor (Varanus prasinus), and the blue-spotted tree monitor (Varanus macraei). Photo courtesy of Jessica Lyons. Source: Nautch and Lyons 2012.

Indonesia is a focal point of international organizations and foreign government programs for species protection, especially for charismatic mammals, birds, and reptiles, because species biodiversity is at such risk here. The IUCN Red List for Indonesia has been augmented significantly since the last assessment in 2008. This is a good indicator of the pressure that biodiversity (and by association, tropical forest habitats) is facing in Indonesia. The updated Red List is found in Annex F. A comparative analysis of species at risk during the past 10 years is shown in Exhibit 5.

Exhibit 5. Comparative Analysis of Species at Risk of Extinction, 2001 to 2012*

Taxonomic Group	Species at Risk of Extinction Listed in			Species at Risk of Extinction Increase from 2008-2012	Total Species in Indonesia 2012	Percentage of Species At Risk of Extinction
	IUCN Red List 2001	IUCN Red List 2008**	IUCN Red List 2012***			
Mammals	128	183	589	322%	670	96%
Birds	104	115	1,587	1,380%	1,604	93%
Reptiles	19	27	365	1,352%	749	93%
Amphibians	-	33	238	721%	285	86%
Fish	60	111	960	865%	1,155	88%
Insects	-	-	-	-	250,000	-
Mollusks	-	3	82	2,733%	20,000	96%
Other Invertebrates	-	229	560	245%	-	59%
Crustaceans	-	-	98	-	525	-
Total Fauna	-	-	4,419	-	275,000	-
Flora	184	386	1,078	279%	29,375	64%

***T**he 632 species labeled data deficient in the 2012 IUCN Red List were not included in this table.
****Of the 5,015 species included in the 2012 IUCN Red List for Indonesia, 60 percent were added after 2008.
*****Of the 5,015 species included in the 2012 IUCN Red List for Indonesia, 42 percent were added in 2012.
Sources: IUCN Redlist, 2012, www.iucnredlist.org, accessed November 7, 2012.
Collar & Andrew (1988).
IBSAP 2003

C. Mangroves

Mangroves are a critical interface between land and the seas, an integral marine component, but are viewed as a forest resource and as natural national capital. They are administered through the Ministry of Forestry and the forestry *dinas* in the districts, but the niche they occupy in both ecosystems often means they are neglected by both.

Indonesia has the most extensive mangrove system in the world (ASEAN 2010) and it represents more than half of Southeast Asia's mangrove resources (see Maps 8-10 in Annex J). It also is the country where mangrove degradation and destruction is at its most severe. Although the mangroves' critical ecological role has become clear to the scientific community, citizens of Indonesia remain ignorant of their importance for food security, as a natural climate change "mitigator," and as a sustainer of biodiversity. A recent estimate of the ecosystems value of mangrove puts each hectare at $5,478 per year (Dirhamsyah 2012). Exhibit 6 illustrates the extent of this important resource in Indonesia and deforestation and the degradation that is occurring through harvesting for charcoal, firewood, construction material, and clearing for aquaculture. The assessment team witnessed this in visits to coastal sites and in discussions with NGOs, fishers, and government officials. Indonesia needs to find a way to heighten the awareness of this important resource and craft management tools that allow districts to realize their significant value. As other nations (Senegal, Gambia, Madagascar, Sri Lanka, Philippines) have realized, mangrove rehabilitation is mandatory to protect and conserve coastal resources and very expensive to replace.

Exhibit 6. Mangrove Zone Conditions of Particular Islands in 2006

Island/Province	Mangrove Zone Condition (hectares)			Total
	Good	Moderate	Damaged	
Sumatra	239,251.67	389,504.45	1,408,012.70	2,098,302.82
Bangka Belitung	69,224.84	87,238.69	117,229.29	273,692.82
Java	7,530.27	36,726.41	72,398.62	116,655.30
Nusa Tenggara	19,311.05	30,099.96	9,586.72	58,997.73
Bali	1,553.00	161.00	253.40	1,967.40
Borneo	164,480.89	10,949.00	197,667.94	373,097.83
Papua	1,152,412.00	273,930.00	12,079.00	1,438,421.00
Sulawesi	9,338.86	6,633.21	13,649.49	29,621.56
Total	1,663,102.58	835,242.72	1,830,877.16	4,390,756.46

Sources: Dephut, 2012, www.dephut.go.id, accessed November 5, 2012.
Fourth National Report The Convention on Biological Biodiversity, Ministry of Environment 2009

D. Marine

Indonesia is the biggest maritime nation in the world with sea at close to 75 percent of its total area. About a quarter of the country's population live in coastal communities and depend directly on marine and coastal resources, with a larger proportion living on coastal plains taking a significant percentage of their daily protein intake coming from the sea. It is estimated that more than 20 percent of Indonesia's gross domestic product comes from its seas and oceans (Oldfield 2012). In the past 10 years, significant changes have occurred that are affecting, and will continue to affect, Indonesia's marine and coastal resources. Thirty years after publication of its atlas of marine and ocean resources, Indonesia is again reviewing the importance of its most ubiquitous resource. The CTI, which USAID has supported and continues to support (through the Coral Triangle Support Partnership, IMACS, MPAG projects), has helped significantly to highlight the importance and fragility of marine life and its importance to Indonesia's own economy and food security. It has also opened avenues of communication and cooperation, both intra- and inter-governmental, for managing the region's seascapes and resources and has developed definitive action plans and management strategies (CTI 2009, Dirhamsyah 2012).

The new Ministry of Marine Affairs and Fisheries (MMAF) continues to find its "sea legs," building its capacity to manage and be an effective steward of the resource. USAID and other donors are also working with the ministry to ensure wider compliance with international treaties (such as the United Nations Convention on the Law of the Sea) and Indonesia's own laws. Fisheries Laws 31/2004 and its recent amendment 45/2009, for example, aim for an adoption of a global approach to fisheries management and to conserve and manage the resource consistent with international standards (USAID IMACS 2012a).

Marine biodiversity conservation priorities are being re-established (Huffard et al. 2012), and there is a renewed commitment to expand the MPA system by 20 million more hectares by 2020 (CTI 2012); this in addition to the more than 15 million hectares of protected areas added since the last assessment). Major efforts to develop growth strategies with the "Blue Economy" label that highlights the marine sector's importance to Indonesia's sustainable economic growth are in vogue in 2012. These are positive elements that will reshape awareness of coastal and marine

resources. The country has seemingly woken up to the fact that it is an island country and its sea and ocean resources are an important element of its natural environment and economic development. The drive to bolster and fully encompass this resource in its economic development provides significant opportunities, and risks.

Findings of earlier assessments about degradation of marine habitats critical to sustaining the main components of its biodiversity and populations still ring true. Indonesia has the largest area of threatened reef in Southeast Asia (see Maps 3 and 4 in Annex J) (Burke et al 2012). A recent study of the condition of Indonesian coral reefs found that only 5.8 percent were in excellent condition and 26.95 percent in good condition, with more than two-thirds in fair (36.90 percent) and poor (30.76 percent) condition. Indonesia was rated among the nine countries most vulnerable to the effects of coral reef degradation, based on its exposure to reef threat and reef dependence, combined with low ratings for adaptive capacity (Burke et al 2012). Overfishing and destructive fishing pressure drive much of the threat, followed by watershed-based pollution and coastal development (Burke et al 2011). Seagrass is the main diet of dugongs and sea turtles and a habitat for many commercially important species of fish, shrimp, and shellfish, with seagrass beds linked to coral reefs and a nursery for many reef fish (see Maps 13 and 14 in Annex J) (Dirhamsyah 2012). High-value species such as sharks and grouper have been "ruthlessly exploited" (Oldfield 2012). Coral reef degradation, the loss of mangrove habitats and their complementing sea grass beds, siltation, and pollution from terrestrial mining, and mounting solid waste and sewage disposal from Indonesia's rapidly growing coastal inhabitants all contribute to putting these resources at greater risk. The growing number of endangered marine and fish species on the IUCN Red List (see Annex F) are obvious indicators of these events.

The importance of marine resources to the Indonesian economy cannot be overstated. Marine resource extraction and related activities account for 30 percent of the Coral Triangle's member countries' employment. Indonesia is the 11th largest fish exporting country, accounting for 2 percent of total global fish exports, valued at $2.66 billion. However, Indonesia loses an additional $2 billion to illegal fishing each year (McVey and Abbey 2011). Overfishing continues to erode the resource (see Map 6 in Annex J). Large segments of the population have shifted from farming and other professions to fishing despite the low wages in fishing (about $600 to $700 a year). The low wages and pressure to yield big catches has encouraged increased overfishing and dynamite fishing, which is not sustainable (McVey and Abbey 2011). The lack of mention in the Master Plan: Acceleration and Expansion of Indonesia Economic Development 2011-2025 (MP3EI) of conservation and sustainable harvesting of marine resources is especially troubling.

National policies are aimed at increasing production, but not sustaining it (see Section III). The policies reflect a perception of a future where Indonesia's fish are competitive on the world market and are recognized as a high-quality resource, a further indicator of a healthy and biologically rich and diverse population. In the meantime, illegal and destructive fishing practices continue that undermine future production (Burke et al. 2012, Shrivastav 2012). In visits to marine-dependent sites, the assessment team found that local fisher folk in particular suffer disproportionately to sustain their livelihoods, as they are forced to fish further afield into seas and oceans for which they are not equipped. And in its effort to increase fish production, the Indonesian government's policy to provide 1,000 new boats (of large capacity) is likely to

further exacerbate the problem of an overfished resource. Fewer, rather than more, boats is a more appropriate approach.

The Coral Triangle initiatives of the past decade have helped to show that Indonesia is incredibly rich in marine biodiversity. These same projects and accompanying research have also illustrated how fragile the resource and that the tipping point has probably already been reached (ASEAN 2010) in some areas. The multi-agency funded CTI program has in the past several years identified and confirmed marine and coastal areas of significant biodiversity. Some of these have already achieved greater protection status (see Annex D) and are included in the 15 million hectares of marine protected areas added in the past four years. Others, including large swaths of the mega-rich zones surrounding Papua, remain as open fishing areas to commercial interests (Burke et al. 2012, Huffard et al. 2012).

The Blue Economy

The Blue Economy can help ensure the effective use of Indonesia's costs and oceans and their embodied resources in order to boost economic growth and at the same time ensure environmental sustainability and social equity. The blue economy is defined as an economic model that employs green infrastructure, technology and practices, innovative and inclusive financing mechanisms and proactive institutional arrangements for meeting the twin goals of protecting coasts and oceans, and at the same time enhancing their potential contribution to sustainable development, including improving human well-being and reducing environmental risks and ecological scarcities. In the blue economy, growth in income, employment and prosperity and driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and environmental services from the coasts and oceans.

— Dahuri 2012

There is a lack of unified leadership that is able to bring together research, configure dynamics of the MPAs and address the paucity of data collection and monitoring, and enforcement at the district and national level into a cohesive and stabilizing strategy. Donor-funded efforts like the USAID IFACS program have helped develop and promote basic marine management tools that are being tested and used at a number of locations. In several instances, the assessment team learned that some districts are witnessing fledgling success in their implementation. But there is continued disharmony in sector strategies even at the national level. Many engaged in the marine sector are claiming ownership of the Blue Economy and touting it as a panacea, without a solid understanding of what it is. Bogor Agricultural University (IPB) professor Dahuri (2012) has outlined 13 principles that form the basis for guiding the blue economy and illustrates that it is not a linear process. The government, and most appropriately, the MMAF, should be leading the effort for a national vision of how it works and clearly show its connections with the broader economy. USAID is lending substantial support (USAID IMACS 2012b) to many of the facets of the Blue Economy and is working with the MMAF using a U.N./FAO model that works to create/add value throughout all levels of the aquatic production system (USAID IMACS 2012c).

To protect and sustain marine biodiversity, the sector will need (in addition to a commitment to expand the MPA system) a more cohesive effort to build management and monitoring capacity of the resource and the livelihoods and industry dependent on it in the long term. National and district level decision-makers and planners also will need roadmaps and guidelines that facilitate rational, step-wise approaches to their implementation. The CTI and other donor initiatives are helping to provide guidance on where priority actions are needed and management activities have been outlined. But the MMAF needs additional staff, capacity building, and funds to assist the provinces and *kabupatens/kotas* that will implement these actions and plans.

E. Freshwater

On a global scale, Indonesia has significant freshwater resources; they account for almost six percent of the world water resources or about 21 percent of the total resources in the Asia-Pacific region (WEPA 2012). Rainfall is abundant (about 80 percent falls in the October to April rainy season) and often comes with heavy rainfall events. Countrywide, the long-term average is about 2,700 millimeters/year, ranging from 4,000 millimeters in some areas (Sumatra) to less than 1,500 millimeters in others (East Nusa Tenggara). There are about 5,600 rivers in Indonesia, most of them relatively short, seasonal, and often with a heavy sediment load due to the high rainfall intensities (Hendrayanto 2004). Inland waters cover 534,500 square kilometers, classified as 394,000 square kilometers of swampy areas, 119,500 square kilometers of catchment areas and flood plains, 16,000 square kilometers of manmade lakes/reservoirs and 5,000 square kilometers of natural lakes/ponds. There are 521 lakes, with 14 having depths of more than 400 meters. The largest, Lake Toba on Sumatra, has a surface area of 1,130 square kilometers and is 590 meters deep. Taken together, the nation's lakes are estimated to have 500 cubic meters of freshwater (UN 2004).

This abundance is not evenly distributed, and numerous sources (Haryani et al. 2007, UN 2004, WEPA 2012) note that fresh water availability is severely threatened, if not on the verge of crisis. Freshwater sources on the islands of Java, Bali, and Nusa Tenggara Timur are especially threatened (UN 2011) and have been for more than 10 years. These resources are polluted from agricultural runoff, siltation, sewage inputs, and household solid waste and grey water. The incidence is climbing; the number of polluted rivers and lakes rose 22 percent from 2009 to 2010 (Satriastanti 2011). Few towns and municipalities have adequate sewage or wastewater disposal systems. Natural freshwater streams and rivers carry the bulk of these loads — downstream through neighboring communities and eventually into the seas — creating substantial vectors for waterborne disease. (The increase in dengue throughout Indonesia is probably a direct result of these conditions.) Surface-level contaminants are also leaching into groundwater systems.

The team discussed some of these freshwater source and sanitation issues with the USAID IUWASH project, village dwellers, and district officials near Jayapura (Papua), where the population is seriously at risk. In this case, the problems are exacerbated by longer drought periods (which are apt to increase with climate changes) and migrant populations that are moving to critical watershed areas. Jayapura officials said that on a worsening scale of 1 to 5, it is already at Level 4. Local governments are also confronting poorly planned infrastructure and new road construction that is affecting water supply for the city. A new USAID initiative in the Cyclops Mountains outside of Jayapura is just underway, implemented by Flora & Fauna International (FFI). It seeks to promote more cohesive and REDD+-friendly watershed management practices and will confront some of the same district issues of cross-sector cooperation, public participation, and better monitoring of resources and enforcement governing freshwater use.

USAID's experiences here and at other sites where IUWASH is active provide lessons learned and some practical experience for what is being called for by the Water Environmental Partnership of Asia (WEPA), especially against the backdrop of a rapidly growing economy that will demand even more clean water. WEPA in its recent Outlook Report (2012) noted that the biggest current and future challenges that Indonesia faces for its environmental water management include:

- Additional strengthening of water management legislation and policy
- Providing incentives and communication tools for enforcement
- More stringent water monitoring, especially effluents
- Having better coordination with other sectors that affect water protection, conservation, and use
- Ensuring greater stakeholder involvement in the management of the resource

Under Indonesia's decentralization initiatives, the national government establishes laws and policies that guide freshwater protection and use by the public and private sectors; provinces and districts can make their own rules to be more stringent. But the onus for implementation and enforcement is at the local level. If Indonesia is to avert a water crisis, it needs to begin applying environmental governance principles that are similar to other countries efforts in the region. *Kabupaten* and *kota* decision-makers need to engage in freshwater management activities that are not just practical/functional, but also are transparent, fully accountable, and steeped with public participation.

No single national body maintains a regular inventory of information about freshwater resources or maintains public records about their purity. There is a system of clean water classes, and water quality is monitored on fewer than 50 rivers in the country. The current national freshwater standard is Class II, or water that can be used for recreation, freshwater fish farming, animal husbandry, irrigating gardens, (but not for drinking, which is Class I). Of all the national rivers monitored in 2009, 56 percent failed even Class II compliance (WEPA 2012).

Until standards are understood and enforced at the local level, the nation's freshwater will remain at a substantial (and growing) risk. Logging and mining wastes of the Mahakam River, which have caused a three-fold increase in pollution levels since 2009, are evidence of this (Mattangkilang 2012). In addition, the maintenance and survival of freshwater microorganisms, fish, crustaceans, insects, waterfowl, and other biodiversity are similarly threatened. (And, the high seasonal variability that is predicted with climate change will increase this threat.) In other areas, heavy metal pollution from upstream mining, especially uncontrolled artisanal mining and its use of extremely toxic substances (mercury, cyanide, etc.), is especially dangerous to Indonesia's freshwater resources. On another front, stream and river gravel mining physically disrupts water flow patterns, increases siltation, and exacerbates flooding.

Freshwater aquaculture, especially on Indonesia's coastal plan areas and along rivers, creates waste and sediment loads in times of flooding and flushing that are extremely toxic to other forms of life in adjacent areas. The government's new policies to increase aquaculture production will put additional pressure on freshwater resources; planners and decision-makers will need to proceed carefully if local freshwater biodiversity has any value at all.

F. Natural Areas of Critical Importance

Indonesia with its mega-diversity has many natural areas and habitats that require, or will soon require, careful planning, conservation planning, and protection. The Leuser Ecosystem in northern Sumatra, unique mountain habitats of Kerinci Seblat, Banda Sea, Bird's Head region of Papua, and peat swamps of Kalimantan and Papua all have unique attributes and large concentrations of endemic flora and fauna. And this is only a partial list. These areas are critical

not just because of their uniqueness in the natural world, but also for the environmental services they provide to the Indonesian economy. If these areas are eroded in size, left unprotected from agricultural encroachment, chainsaws, overfishing, fires, and illegal wildlife trade, the impact could be devastating. The Leuser Ecosystem, for example, not only harbors unique habitats, plants, and animals, it also is the water tower for 15 districts and three provinces. Encroachment on its fringes by palm oil estates, cacao farmers, and illegal tree felling within its borders are already leading to downstream flooding and siltation. These actions, combined with mounting pollution and sanitation problems from increasing immigrant populations along water courses and the increased intensity of rainstorm events brought on by changes in climate, are precursors to disasters for downstream populations from flooding, siltation, and water-borne disease.

The coastal zones bordering the Banda Sea are equally stressed from terrestrial mining that brings chemical pollutants and siltation to the sea. Mangrove destruction and degradation on its shores wrought by poor and unenforced planning and an extreme undervaluing of the resource that mitigates coastal erosion, and breeding areas for small and large fish, and a habitat for crustaceans means in the not-too-distant future that the economic impact on the fishery resource of that sea will be under extreme threat. The impact is already being felt in areas like Kendari where small-boat fishers no longer have the catch necessary to support them and must take greater risks moving out into the deeper and more dangerous (for them with their meager equipment) Banda Sea to sustain their livelihoods.

These are only two examples of the critical nature of Indonesia's natural areas. Each one is confronted by similar forces, mainly because their environmental services are undervalued or their links to the economy are not adequately understood by stakeholders. Since the last assessment in 2008, numerous studies (ADB 2010, Oberman et al. 2012) have noted that critical areas that are important components of Indonesia's natural capital are being seriously eroded and will continue to have a growing impact on the ability of the Indonesian people and the ability of the economy to sustain itself. Indonesia is squandering its natural heritage by allowing destruction of its forests to continue unchecked and its marine resources to be overfished.

G. Protected Areas

Indonesia's protected areas system has changed substantially since the last assessment in terms of designations, number of areas, and the amount of area within the system. The number of protected areas has increased by 57, and the total area within the system rose by 12.7 million hectares (see Map 7 in Annex J and Exhibit 7 below). The biggest gain came with the national park classification. Many of the terrestrial areas were consolidated and gained increased protection status under the IUCN classification system. MPAs increased by more than 15 million hectares. And as noted above, more are being planned. The assessment team also learned of a new MPA being established in Sulawesi Tenggara that will cross boundaries of three districts. A complete up-to-date list of Indonesia's protected areas in found in Annex D. Three of Indonesia's terrestrial; protected areas (Leuser, Kerenci Seblat and Lorentz National Parks) have been named by ASEAN as Heritage Parks, which recognizes their unique ecological attributes and eco-cultural activities (ASEAN 2010) on a regional (and global) scale. No other ASEAN country has that many such parks within its borders.

Despite the increasing amount of area within the system, organizational, budgetary, and management problems remain. Lessons learned and experiences gained by management teams are slow to circulate and be shared. In most protected areas, technical acumen remains low, and management plans are seriously lacking. Most of the work that continues is funded by international NGOs. Political leadership and will are not present, resulting in a lethargic approach to management, financial investment, and capacity building.

Borders are also not respected for a host of reasons. Gunung Leuser National Park still has not demarcated its boundaries 20 years after its establishment. Encroachment is a substantial problem there and in many protected area sites. The emphasis from most *bupatis* is on economic return. In Sumatra and Sulawesi, cocoa and coffee incentives are pushing farmers against and into the protected areas as they seek more land for commercial crops. In Papua, the assessment team learned of new districts being created inside established national parks. New districts in Papua's special autonomy zone mean that more funds are available from the central government, which can be used to clear land and develop infrastructure to support other development. Local populations that did not have a hand in the national park's establishment have no tangible incentives to stop this type of development. Because it is likely to bring alternative sources of livelihood, there are incentives to support the new districts.

In discussions with Leuser National Park staff and with Forest Protection and Nature Conservation Ministry of Forestry officials, it was evident that many protected areas lack a technical manager. And if they do have one, budget and responsibilities are stretched too thin to be effective. Planning and collaboration with adjacent districts will not happen without basic staffing and technical expertise. Many of the protected areas exist only on paper. There also continues to be overlap with jurisdiction. The Ministry of Forestry also continues to manage several MPAs despite their more logical home in the Ministry of Marine Affairs and Fisheries (which is responsible for most MPAs).

USAID and other donors have invested significant resources in the nation's protected areas. Capacity building linked to management plan development and long-term planning, zonation, human resources development, and training were some of the activities implemented. These flourished with a centralized chain of command and decision-making. Some, like Bunaken and Wakatobi, are seen as world-class sites today. Now, the onus for revenue generation and conservation linked to these protected areas is at the local level, and the capacity to manage is low. As Indonesia's economy expands and the middle class grows, there may be a growing interest and awareness in conservation, but it needs to the harnessed into a more national framework with a strategic vision and champion(s) to guide it. Some districts, like Gayo Lues in Aceh Province, understand this. They are working collectively with broad participation to ensure that protected areas stay protected so that the environmental services they provide can continue to be a cornerstone of the district. They recognize that appreciation of the environment is the backbone of sustainability.

Exhibit 7. The Indonesia National Protected Area System, 2006 through 2012

Protected Area Classification	Number of Areas 2006	Number of Areas 2012	Total 2006 (hectares)	Total 2012* (hectares)	Percent 2006	Percent 2012	Difference (hectares)
Cagar Alam (Nature Reserve) Terrestrial	219	188	4,332,258	6,048,200	14.4	14.1	1,715,942
Cagar Alam (Nature Reserve) Marine	10	108	216,555	4,028,200	.7	9.4	3,811,645
Suaka Margasaatwa (Wildlife Reserve) Terrestrial	69	25	5,120,647	1,501,200	17	3.5	-3,619,447
Suaka Margasaatwa (Wildlife Reserve) Marine	7	6	342,940	1,037,200	1.1	2.4	694,260
Taman Nasional (National Park) Terrestrial	28	36	7,766,211	12,039,000	25.8	28.1	4,272,789
Taman Nasional (National Park) Mixed	15	-	4,635,737	-	15.4	-	-
Taman Nasional (National Park) Marine	7	35	4,045,049	11,743,600	13.4	27.4	7,698,551
Taman Wisata Alam (Nature Recreation Park) Terrestrial	100	73	358,932	298,100	1.2	0.7	-60,832
Taman Wisata Alam (Nature Recreation Park) Marine	17	10	765,482	241,400	2.5	0.6	-524,082
Taman Hutan Raya (Forest Park) Terrestrial	17	-	274,899	-	.9	-	-
Taman Buru (Hunting Park) Terrestrial	14	16	225,993	267,816	.8	0.6	41,823
Kawasan Konservasi Laut Daerah Marine Protected Area	23	86	2,025,668	5,621,378	6.7	13.1	3,595,710
Total	**526**	**583**	**30,110,372**	**42,826,094**			**12,715,722**
Total Terrestrial Area	**462**	**338**	**22,714,677**	**20,395,716**	**75.5**	**47**	**-2,318,961**
Total Marine Area	**64**	**245**	**7,395,594**	**22,430,378**	**24.6**	**53**	**15,034,784**

III. SOCIAL AND ECONOMIC CONTEXT

A. Social and Economic Factors

Indonesia is a country for which descriptions such as 'largest', 'fastest', 'most' and 'highest' frequently appear: the largest archipelago in the world; the largest democratic Muslim nation; fourth-largest population; most culturally diverse; most active volcanoes; one of the fastest-growing economies; after China and the United States, the largest emitter of greenhouse gas; and until recently, the highest deforestation rate in the world. And for its biodiversity, Indonesia is one of six Asian countries — China, India, Indonesia, Malaysia, Papua New Guinea, and the Philippines — that are among 17 "mega-diverse" countries that contain 70 percent of the world's biodiversity (Conservation International 1998).

Indonesia is at "the heart of the world's most dynamic economic region." (Oberman et al. 2012) Between 2000 and 2010, Indonesia's real growth increased at an annual rate of 5.2 percent, the third highest in the world, behind only China and India. Its economy is now the 16th largest in the world. This is a remarkable transformation from the Suharto-era economic stagnation of the late 1990s and the sharp (14 percent) constriction of its gross domestic product during the Asia economic crisis (CMEA 2011).

Indonesia perceives itself as a regional and global player with increasing political influence and economic power. An active ASEAN member, it is the only ASEAN country that is a member of the G-20. As a member of the G-20, it has endorsed agreements on finance, trade, environment, and human rights. It is a major exporter of commercial agricultural products and natural resources to other Asian countries, particularly China and India, with recent annual growth rates of 15 to 20 percent. Indonesia is the world's largest exporter of palm oil, with India its largest market ($3.8 billion or 80 percent of India oil palm imports) and another $2.1 billion of palm oil to China. It is also the world's largest coal exporter, with China its top market. (Doberman et al. 2012).

If the government's Masterplan for Acceleration and Expansion of Indonesia Economic Development 2011-2025 (MP3EI) succeeds, Indonesia will by 2025 become one of the 10 largest economies in the world and raise its per capita income from the current $3,000 to $13-16,000 in 2025 and $26,000 by 2030 (Oberman et al., 2012, CMEA 2011). Although it is unlikely that Indonesia will meet all or even most of the targets set by the MP3EI, the nature and scope of the plan suggests a change in the government's strategic vision, domestically and internationally, sets down its development priorities, and implicitly signals political changes, i.e. revisiting decentralization that will be needed. Indonesia will work to shift its economy's reliance on exports of raw materials toward increased domestic consumption of indigenous resources and creation of a much larger manufacturing base. However, its success requires long-term planning and investment that is currently hampered by Indonesia's highly diffused power structure. And the government must continue to address current barriers to private sector investments: administrative red tape, overlapping jurisdictions and land acquisition issues, and improved legal environment to attract the level of investment needed (CMEA 2011).

Indonesia's economic success of the last decade is reflected in its progress toward meeting or exceeding most of its Millennium Development Goal targets for poverty (although not for halving poverty), education, child mortality and health, contraception use, reform of its trading and financial system, and increasing access to the internet. Within these achievements, however, are continuing disparities between provinces and gender. For example, although Papua generates the highest provincial revenues in Indonesia, its poverty rate is more than double the national average and education, and health progress significantly lower. Papua has the lowest literacy rate, years of completed schooling, life expectancy, and the highest rate of HIV/AIDS.

Gender is an important consideration in the conservation of biodiversity and forests. In Indonesia, as elsewhere, men and women play different roles in forests and natural resource management, and these differences apply between and within cultures, communities, and households throughout the archipelago. Women living in or near forests tend to rely most directly on non-timber forest products and tend to be disproportionately harmed by deforestation and interest in forest conservation. At the same time, women's specialized knowledge of forestry, botany, biodiversity, and water management makes them critical resources in combating deforestation and biodiversity preservation

Indonesia's performance on gender lags behind other ASEAN countries; only Lao People's Democratic Republic ranks lower than Indonesia in the United Nations Development Programme (UNDP) Gender Inequality Index (UNDP 2012). There has been progress in a number of key areas, with a steady improvement in women's relative education. Access to contraception has assisted Indonesian women in having one of the lowest fertility rates (2.1), of ASEAN countries. However, Indonesian women also experience one of ASEAN's highest maternal mortality rates: 240 compared to 31 for Malaysia and 32 for the Philippines (BAPPENAS 2012). In Indonesia's vibrant civil society, many NGOs are working on gender equality issues. Nevertheless, Indonesian women continue to be more vulnerable to chronic poverty due to persistent gender inequalities in income distribution, access to credit, control over property and natural resources, and access to employment and livelihoods opportunities (UN WOMEN 2012). Violence against women remains prevalent. Gender inequality remains a challenge in many development projects, with the needs of women not accommodated and with little opportunity for participation.

Nevertheless, overall, Indonesians are better educated, have more employment opportunities (including women), will live longer, and own cell phones (more than 80 percent). They are more urban and have greater access to (and higher expectations of) electricity and water. Cell phones provide not only basic phone services, but also innovative applications in business, health, and education that contribute to human development (UN 2010).

However, key targets for environmental sustainability as noted in the Millennium Development Goal 2011 report "still require a great deal of work." The actual forest cover-to-land area dropped from almost 60 percent in 1990 to less than 53 percent in 2010. Carbon dioxide emissions increased substantially (most of which are deforestation related). Protected areas fared better; there was a slight increase in terrestrial protected areas and a significant increase in marine protected areas (from 1.4 percent in 1990 to 4.97 percent of ratio of MPAs to total marine areas). The effectiveness of protected areas in halting erosion of biodiversity and deforestation is under question because inadequate resources are allocated to surveillance, monitoring, and

enforcement. Indonesia's future economic development is guided by plans including the MP3EI and implementation of agricultural expansion projects such as the Merauke Integrated Food and Energy Estate in West Papua will have a profound impact on land use and concomitantly on biodiversity and forests. Decisions at the national and local level made in support of the new economic plans and policies will have a significant effect on the day-to-day life of Indonesians — if successful, there will be increasing income, equity, education, and connectivity — but there will also be further pressure on Indonesia's biodiversity and forests that are already under severe threat and if not better regulated, it will undermine the sustainably of its economic growth.

Deforestation and habitat loss in Indonesia is a reflection of the higher priority given to economic development and the lack of incentives for conservation or sustainable management. A review of the MP3EI, for example, reveals no mention of biodiversity, little mention of forests except for timber production, and conservation is only mentioned in the context of water conservation (for agriculture production). Marine ecosystems are noted for their potential for the fisheries industry, not for conservation, ignoring basic tenets of sustainability.

To achieve the pace of economic development that is targeted by the government, there is recognition that there has to be a change in the role of government to one in which it provides a set of rules and regulations that provide incentives for investors (e.g., conducive policies on tariff, taxes, import duties, labor regulations, licensing, and permits) to build industries and infrastructure. This includes the central and local governments working together to build reliable links within and beyond the centers of economic growth (CMEA 2011).

There is also recognition that there must be changes and harmonization of policies and regulations to create an enabling environment related to mining farming, forestry, environment, and spatial planning to minimize barriers to optimizing production and in-country added value and to increase value added for export-oriented products, e.g. fine-tuning legislation and licensing of oil and gas sector. Overlapping sector jurisdictions are creating barriers for development, e.g., the overlapping of land use for mining and for forestry or plantation in Kalimantan (CMEA 2011).

B. Governance Factors

Effective governance of Indonesia faces significant challenges. One is Indonesia's geography: how to build an operable, integrated national economy with consistent transport, power, and regulatory systems across 17,500 disparate, culturally and religiously distinct islands. Another is its history; the center's ongoing attempts to exert itself over, accommodate, deflect, and navigate the interests of outer islands, whether through strong centralization of power or greater regional autonomy (Stratfor Global Intelligence 2012).

The political structure of Indonesia has undergone far-reaching changes since Suharto's fall in 1998. Since 2004, with a new constitution and political reforms, the president and vice-president have been directly elected and have term limits. The legislative branch, the People's Consultative Assembly (*Majelis Permusyawaratan Rakyat, MPR*) is a bicameral parliament with an upper house of the Regional Representative Council (*Dewan Perwakilan Daerah, DPD*) with regional representation and tasked to matters concerning regional autonomy, the relationship of central

and local government, formation, expansion and merger of regions, management of natural resources and other economic resources, and bills related to the financial balance between the center and the regions. The lower house of the People's Representative Council (*Dewan Perwakilan Rakyat*, *DPR*), sometimes referred to as the House of Representatives has three main functions, legislative, budgeting, and oversight, has 560 members, elected for a five-year term by proportional representation (Indrayana 2008) The DPR has been gaining in power and becoming more assertive in oversight of the executive branch.

The judicial system is referred to as extremely complex, with the Supreme Court (highest judicial institution), Constitutional Court, general (including commercial children's and human rights courts), religious, military, and administrative (including tax) courts (ASEAN Law Association 2005). For natural resources management, the ministries of forestry, marine affairs and fisheries, and agriculture are under the Coordinating Ministry for Economic Affairs, while the Ministry of Environment, tasked with environmental quality and good environmental governance, is under the Coordinating Ministry of People's Welfare. A number of policies have been approved since 2009 that significantly shift management of land, forests, and coastal marine resources to districts (see Annexes G and H). Although environmental safeguards have been strengthened, without their enforcement, there are strong incentives for local decision-makers to issue permits and licenses that will generate immediate revenue but result in unsustainable exploitation.

With the democratization in the last decade, civil society organizations (also referred to as societal organizations) have dramatically increased in number — more than 20,000 societal organizations (including associations and foundations) are registered with the Ministry of Law and Human Rights (ICNL 2012) — and are playing an important role, not only in advocacy and as a watchdog for corruption, human rights, and the environment, but also in providing information and services. Civil society organizations are actively engaged in environmental issues at the local (district), provincial, and national levels, as well as in consultations on REDD+ projects and other international initiatives such as Forest Law Enforcement and Governance and Trade (FLEGT).

Corruption remains a serious problem, but progress is being made, albeit more slowly than civil society and the business community demand. The Corruption Eradication Commission and national anti-corruption courts were established during the reform era, and civil society and non-governmental organizations have been included in the reform processes. The government has also reformed key regulatory frameworks, such as business regulations and public procurement, to diminish opportunities for corruption. Indonesia's corruption perception ranking has steadily improved: from 137 out of 159 countries in 2005 to 100 out of 183 in 2011 (Transparency International 2005, 2011). Slowing the pace of reform is the "deeply embedded institutional culture of patronage" in which acts of bribery or corruption are not viewed by Indonesia authorities as corrupt practices (UNODC 2012). However, the transition to democracy in the last decade has opened the space for public discussion on corruption. Civil society organizations at the national and local levels are actively engaged in changing attitudes and providing training in fighting corruption (Schonhardt 2010).

Decentralization. Decentralization is commonly perceived as the means to reduce the inefficiencies of the bureaucratic centralized government and as complementary to democratization by increasing meaningful citizen engagement with the government. In 2001, Indonesia enacted one of the most ambitious decentralization policies in the world, shifting a significant level of authority and much of the political bargaining process from the center to the local level (Asia Foundation 2011). In the past decade, decentralization has helped maintain political stability by giving regional and local interests greater control over their own affairs. The centralized system of Suharto's regime resulted in deep social and economic imbalances between Java and the outer islands that fostered regional autonomy movements. In response, post-Suharto governments have decentralized political power in an effort to preserve the nation's integrity; to limit the central government's authority to matters of military and police security, the judiciary, and national fiscal policy, provincial governments were granted limited independence on social policies, while local and district governments gained control over economic policies such as land sales and tax collection. Management of public spending, with the proportion of allocations determined by the local level, has risen from about 15 percent of the state budget in 2000 to around 30 percent in recent years (MacLauren et al. 2011).

Special Autonomy: Aceh and Papua. In 2001, in response to strong independence movements, special autonomy was granted to Aceh and Papua. Going further than the decentralization that was to be implemented in the rest of Indonesia, the government at a weak point facing multiple crises — dependency on international financing, separatist movements, and mass protests — granted special autonomy to Indonesia's most far-flung areas in its west and east (McGibbon 2004). The special autonomy contained significant and special concessions (McGibbon 2004). However, by 2003, a more secure government, in response to its concerns that special autonomy would lead to similar demands from other regions and to the continuing violence in the autonomous regions, imposed martial law in Aceh and moved to subdivide Papua. The declaration of martial law in Aceh eroded the autonomy of local leaders and led to deepening conflict. In 2005, following after the devastating tsunami, a peace agreement ended the conflict, and in 2006 a governing law (Aceh Law 11/2006) was approved.

Although Papua is operating under the special autonomy law (OTSUS) of 2001, Aceh's special autonomy reflects the peace agreement and Aceh Law 11/2006, including its unique right to have provincial (Aceh) political parties. Central to both special autonomy agreements is revenue sharing from natural resources and a special autonomy allocation (Dana Otsus) of a block grant of equal to 2 percent of the national general allocation fund ceiling for 20 years. According to the OTSUS, in Papua (and now West Papua) and Aceh, 70 percent of the revenues from natural resources are to be retained (compared to 10 percent for oil and 30 percent for gas in the rest of Indonesia) (World Bank 2009). However, the actual flow of the total funds, especially for Aceh, has not occurred. Control of natural resources continues to be done jointly by the provincial administration and the central government, which the Aceh government has noted does not follow the 2005 peace agreement in giving more control to the provincial administration than agreed.

Due to the sharing of natural resources revenue, the special autonomy allocation, and decentralization policies, in 2009, West Papua and Papua were the fiscally richest provinces in Indonesia (World Bank and United Nations 2009). However, the political aspects of OTSUS

have either not been implemented or implemented without Papua engagement. This includes formation of local political parties, interpretation of local *adat* and national laws/regulations on land ownership and forestry, and special provisions that inhibit cooperation (e.g. approach and time taken to issues visas to international personnel of cooperation organizations) (World Bank and United Nations 2009).

Papua's unique culture of its indigenous peoples with enormous diversity within each region has been affected by successive waves of migration, historically by colonial governments and religious organizations, followed later by formal transmigration movements from across Indonesia, and currently by the demand for skilled labor by government and the private sector (World Bank and United Nations 2009). Its relative riches have not resulted in development progress to Papuans, who remain the poorest in Indonesia. However, Papua's revenues are projected to continue to rise (double the revenue from resources in 2016 than in 2006), providing potential future opportunities for investment in its people and economy (World Bank 2009).

The government of Aceh has been vocal about not receiving its share of the revenue generated by its natural resources (oil and gas) because of central government bureaucracy (Afrida 2006). Papua is having similar problems because there has been a lack of clarity on legal provisions between OTSUS and national laws on mining and natural resources, including forestry and land (World Bank 2009). Aceh's government has been more effective than Papua in using its special autonomy to support its own culture, e.g., as a conservative Islamic region, it has adopted some provisions of Sharia law for local administration. It has been less successful in gaining control of its natural resources. The Aceh governor imposed a moratorium on logging in Aceh in 2009, but the National Ministry of Forestry upheld that the industrial logging permits which it issued in the 1990s to companies to operate in Aceh were still valid (Forest People Programme 2011).

Decentralization – empowering districts. In Indonesia, decentralization is still a work in progress as more authority continues to be transferred to local governments. Increasingly, decisions that directly affect biodiversity and forests are made at the district level. In 2009, for example, a law was passed that transferred control of mining permits to the local governments. In two years, the number of mining permits issued rose sharply from 579 to more than 10,000, and foreign direct investment grew by 20 percent or more year-on-year. Local governments eager for investment issued overlapping permits to state-owned private domestic and foreign firms. Of 10,566 permits issued by August 2012, nearly 6,000 overlapped with other permits or with protected forest areas. A recent ruling on the 2009 Mining Law by the Indonesia's Constitutional Court amended some articles of the law to grant greater power to local administrations in designating areas for mining. This has the potential for a devastating environmental impact on forest areas if permits are issued by local governments eager for immediate revenue and paying little heed to national regulations or the importance of healthy ecosystems for sustainable growth (Listiyorini and Rusmana 2012).

Indonesia is at a critical juncture: is there district level capacity to conduct not only economic but also environmental planning, monitoring, and implementation? Is there an understanding of the importance of sustainable resource management and the valuation (cost-benefit) of ecosystem services? Are there incentives for long-term planning for sustainability rather than short-term benefits based on immediate exploitation?

Of key importance in building the capacity of district government is MOHA. It is responsible (by law) for managing the national governmental system and local governments, including districts. The implementing regulations and guidelines related to local government systems are facilitated and established by MOHA. It has the authority to review all local regulations and can withdraw/cancel a local regulation if it is found to be counter to the districts authority and national regulations.

A district has two major streams of funding:

- MOHA provides the core revenue for district governments for district staff salaries, administration, and operational expenses (see Exhibit 8) with disbursement through the Ministry of Finance. The funds are from transfers from revenue-sharing block grants (e.g. tax revenues, tobacco, natural resources) and special grants for general and special allocation fund transfers. For special autonomy districts, there are also additional (special) fund transferred. The amount of the general allocation funds is determined on the total areas (geographic), number of people, population density, poverty gaps, and a construction price index. The district gets 90 percent of the calculated amount and the province receives 10 percent.

- The second source of funding is from local revenue, generated by activities such as fees, licensing, and local tariffs. Local revenue is managed directly by the local government (district) based on local legislative approval. Districts with commercial natural resources can generate a sharp increase in revenue by issuing permits and licenses.

The district, within the guidelines of MOHA, has a great deal of decision-making autonomy. Although there may be limits, for example, on the size of area for which it can issue a permit for mining (e.g., small deposit mining of 2.5 million tons) the actual *number* of permits that can be issued is not limited. Locally generated revenue enables the district to not be totally dependent on central revenue that requires (see Exhibit 9) lobbying at the legislature (and informal payment's to the legislative board to receive approval of funds).

The district plans are supposed to align with provincial plans, however, in most areas, provincial plans are still underway; districts are issuing licenses and permits that exceed the area that may be provincially allocated for a specific land use, e.g. palm oil production or mining. Line agencies, such as the Ministry of Forestry, are to provide technical assistance (see Exhibit 9), but currently do not have authority in the district's planning and activities. So even if there is an environmental requirement for a province to allocate forests as a percentage of total area, it is up to each district to decide if it will do so.

The importance of the districts was underscored during the assessment team site visits, as was the apparent lack of capacity for long-term sustainable development planning, especially those involving natural resources management. Environmental policies and regulations were often not known. Concepts such as biodiversity and climate change were not clearly understood nor were the requirements for environmental impact assessments. MOHA is responsible for capacity building of district governments, but its focus has been primarily on administration and managing of budgets, not on management of a district. Although the purpose of decentralization

was to be able to more effectively provide services at the local level, missteps through poor capacity and encouraged by perverse incentives (such as “informal” payments by companies and individuals for licenses and permits) may lead to further degradation of forests and biodiversity.

However, on a positive note, during the last decade there has been a rapid growth in civil society organizations that have taken advantage of increased opportunities created by decentralization to influence the role and functions of local administrations. Civil society organizations are becoming increasingly adept at identifying allies and opponents within and outside the government, mobilizing constituencies and forming coalitions for change, and using their power to negotiate agreements on resource utilization (i.e., budgets and activities) that promotes development. Through this process, civil society organizations are shaping how local governments address issues such health, education, women, the environment, human rights, transparency, anti-corruption, and indigenous people (MacLauren et al. 2011). Conserving forests and biodiversity may to some extent depend on the effective mobilization of civil society alliances.

Conserving forests and biodiversity will to some extent depend on the effective mobilization of civil society alliances. However, local civil society organizations (CSOs) often do not have access to information or the legal or technical capacity that is needed. For example, CSOs in provinces such as Papua are facing major development initiatives that will transform large areas and threaten the biodiversity, forest, and marine resources on which many communities depend. To provide an effective voice for communities and provide technical support, CSOs in the frontlines of these threats need capacity built through partnerships and mentoring (rather than on-off workshops) in policies, legal and regulatory framework, resource management, spatial mapping, and financial and project cycle management (Sosa 2013).

Exhibit 8. The Mechanism of Transfer of Funds from Central Government to Local Government

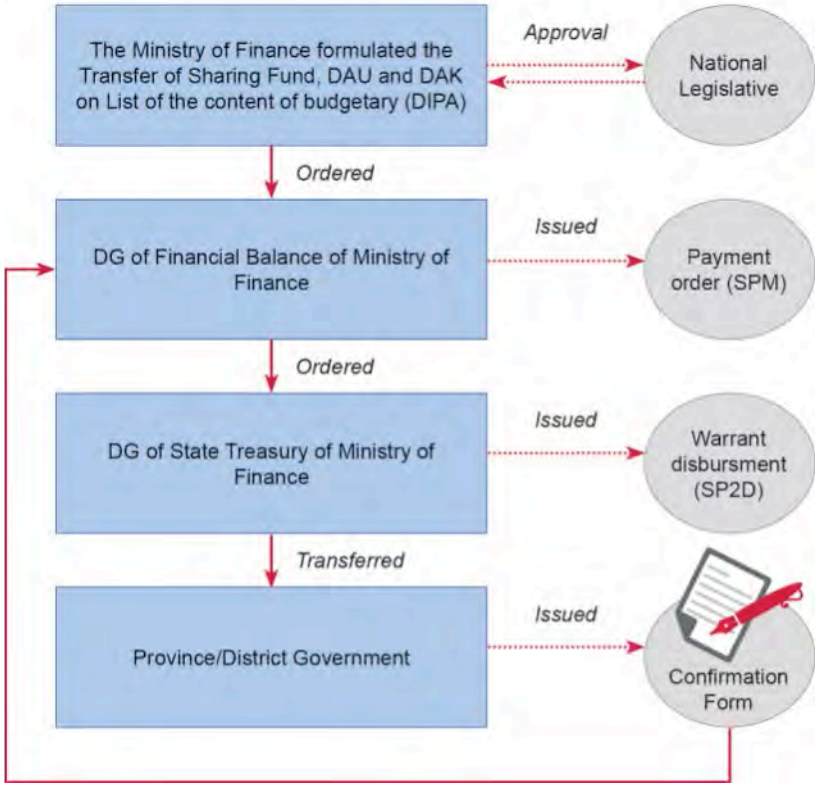
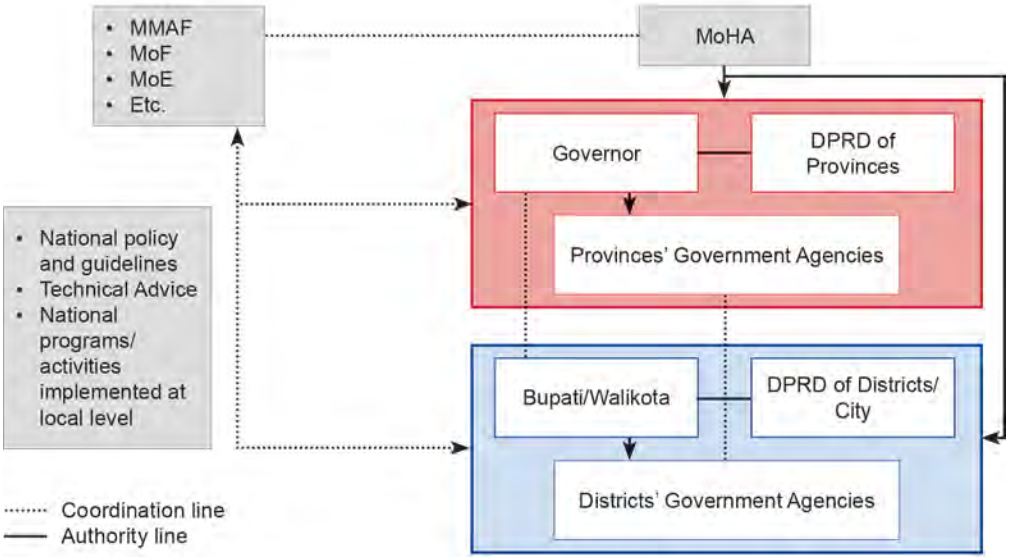


Exhibit 9. Delegation of Authority



IV. THREATS TO BIODIVERSITY AND TROPICAL FORESTS

A. The Underlying Drivers

As the previous section attests, Indonesia is poised to undergo transformational change to achieve its ambitious economic growth targets as detailed in the Master Plan: Acceleration and Expansion of Indonesia Economic Development 2011-2025. Within this strategy, there is no mention of conservation or sustainable use of natural resources, and in fact it promotes economic corridors through the middle of areas of high biodiversity value. With this plan, the current practices that promote the conversion of natural forests to oil palm and rubber plantations encourage overfishing of its oceans, and conversion of coastal areas to farms, ports, and resorts will continue well into the future and result in further degradation of the natural country's ecosystems.

Indonesia is trying to do well for its people: to provide jobs, improve livelihoods, develop infrastructure, and raise its presence and visibility on the world stage to enhance the standard of living of its population. The growth of its economy has been one of the fastest, strongest, and most persistent in the world during the past 10 years, ranking only behind China and India. But its policies and planning fail to include the value of its natural heritage and natural ecosystems as dynamic elements in supporting and sustaining this growth. In fact it is seriously undermining the ability of its natural resources to sustain such a vibrant economy for the new generations to follow (ADB 2010). As noted earlier, appreciation of the natural environment is the backbone of sustainability.

Indonesia is well-equipped legislatively with laws and policies that can help govern the use of natural resources, protect biodiversity, and repair and even improve the sustainability of natural ecosystems. (See the discussion in Section II.) Its attention to the broader and wider expansion of MPAs, the sustainable development approaches promulgated by MOHA related to strategic local government planning are positive and important actions by government in mitigating threats to the environment.

Though by and large, it is still ill-equipped to implement, monitor, and enforce the rules it has established. The disharmony between the provinces and districts and contradictory elements in many policies also inhibit an understanding of laws that exist for rational reasons. Decentralization policies enacted during the last decade are just now illustrating how weak implementation is at the district (regency) level. The national budgeting process puts the funding where it needs to be (although not always in the hands of the most scrupulous of decision-makers), but there is a profound lack of awareness, knowledge, and expertise on how and where to plan and what the sequencing needs are to make the most efficient and productive use of those funds. Technical experience is lacking and few, if any, guidelines exist to provide norms and standards or illustrate the logical limits for wise and sustainable use of a district's resources.

Certainly, it is not all doom and gloom. There are many positive actions being instituted by ministries responsible for Indonesia's natural resources (Forestry, Marine Affairs and Fisheries, Environment). There is real positive progress in chain of custody policy and certification for forest products that was not present even two years ago. The REDD+ initiatives are forcing

significant changes to policies and legislation that affect the conversion of forest land to other uses and hopefully these will be enacted in time to spare further destruction to important fauna habitats. The National Mapping Agency's OneMap initiative holds significant potential for getting resource users, government planners, and resource monitors all on the same page, using the same baseline information for the entire country. The move to provide annual updates countrywide on forest cover changes (Brioch 201) will also mean more transparency for activities carried out at local levels. The utility of this technology will also morph to other land-conversion types that will enable local-level decision-makers to have more effective choices and understand the value of those decisions as well.

As reported earlier, the tolerance for corruption in Indonesia is diminishing more rapidly than any time in Indonesia's history, and becoming a stronger, more public driver that is seeping into numerous sectors. The role of the Anti-Corruption Commission (KPK) is instilling hope and also trying hard to ensure that corruption cannot be tolerated if Indonesia is to continue as an ascending economy in the region and around the globe.

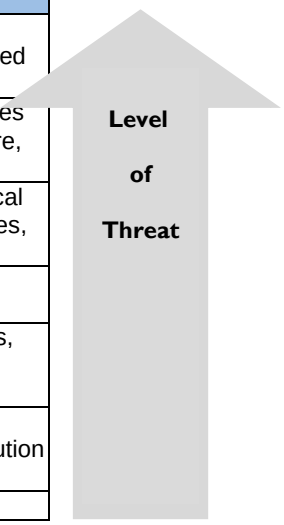
B. Summary of Direct Threats

Based on past trends and looking to the future, the most significant direct threats to biodiversity and tropical forests are conversion of natural ecosystems for commercial agriculture and aquaculture; unsustainable harvesting of forest, freshwater, and marine resources, mining; and in the long term, climate change. Climate change is considered a direct threat because it will not only be a multiplier of existing environmental pressures, but also give rise to new pressures for all ecosystems in the country. These threats remain similar to those reported four years ago, and even eight years ago. Exhibit 10 shows the most important ones for natural marine and terrestrial ecosystems.

The conversion of natural forests into agriculture, predominantly for oil palm estates, during the past decade is the largest threat. Indonesia surpassed Malaysia in the past few years as the world's largest producer of palm oil. The current permitting process and the subsidies enjoyed by the industry for plantations now being established ensures that the country will maintain its position and that forests and forest habitats will continue to be destroyed and fragmented as collateral damage. Mining permits for exploration and extraction, issued at national, provincial, and district levels are reaching all-time highs. In Papua last year (2011), before the provincial spatial plan's approval, provincial authorities issued 44 permits, and 66 were granted by district *bupatis*. In the same vein in Papua, the Ministry of Forestry granted 13 permits for plantations; 80 percent were for oil palm.

Exhibit 10. Direct Threats to Biodiversity and Forests in Indonesia

Natural Ecosystems	
Terrestrial	**Marine**
Conversion of forests into agriculture (e.g., oil palm, rubber, timber plantations, encroachment)	**Overharvesting and destructive fishing**, including illegal, unreported, and unregulated fishing
Mining extraction and exploration	**Conversion and degradation** of mangroves and other coastal habitats (e.g., aquaculture, resort development)
Unsustainable logging, especially industrial-scale (and illegal)	**Climate change** (e.g., sea level rise, tropical storms, increasing sea surface temperatures, ocean acidification)
Infrastructure development (e.g., roads, dams, pipelines)	**Mining extraction and exploration**
Climate change (e.g., habitat modification, alteration of rainfall patterns and temperatures, forest fires, outbreaks of pests)	**Infrastructure development** (e.g., harbors, transport)
Wildlife trade/trafficking	**Pollution** (e.g. municipal and ship ballast waste, oil spills, chemical and thermal pollution from industry, agricultural runoff)
Invasive species	**Wildlife trade/trafficking**



The lack of sustainability in Indonesia's production trends (see Annex E) can be demonstrated by looking at the relationship between deforestation and the expansion of oil palm plantations. Nationwide deforestation from 1990 to 2005 included the greatest losses in primary forestlands (70,419,000 reduced to 48,702,000 hectares) and semi-natural forestlands (43,939,000 reduced to 36,394,000). In areas of significant oil palm plantation expansion, 85 percent to 100 percent of total deforestation took place due to oil palm expansion at the expense of forestlands. This demonstrates that the rate of deforestation can be compared to the rate of oil palm plantation expansion, and oil palm areas expanded, 1970 to 2010, by more than 6,000 percent. If the cost of current palm oil growth rates is the continued brutal assault and loss of Indonesia's tropical forest, then the oil palm industry's growth rates, as well as the growth rates of the pulp and paper and coal industries also responsible for wholesale deforestation, are not sustainable.

Illegal logging remains an issue for forests and terrestrial habitats, but the logging ban instituted in 2007 has had an impact. And relative to the conversion and encroachment threats, it is substantially less. Encroachment by coffee and cacao producers is increasing, especially in Sulawesi and Sumatra. Due to the lack of alternative livelihoods in these areas, farmers are putting greater pressure on the boundaries of protected areas and on critical lands (conservation forest land). Like most countries, Indonesia provides incentives to farmers and subsidizes prices for fertilizer, pesticides, and herbicides; this creates another threat vector on human health (poor application practices, the water table contamination, chemical pollution run-off to streams and rivers) and encourages expansion of agricultural land. Promoting more intensive (including organic) practices would be more beneficial to human health and decrease the threats linked to encroachment into forests and high-value conservation areas.

On the marine side, overfishing and continued use of destructive fishing practices (cyanide, dynamiting, improper/inappropriate equipment use) are the major threat to the fisheries resources of Indonesia. This also includes illegal, unreported, and unregulated fishing. Conversion and degradation of coastal habitats, including mangroves and associated seagrass beds due to resort

development, removal, or improper harvest of mangroves, high density of aquaculture, pollution, run-off and siltation, are also creating larger threats. Indonesia has some of the world's greatest marine diversity in terms of fishes, corals, and sea grass, and has its most extensive mangrove resources, but it also is destroying these at a more rapid rate than any of the other 10 counties in the ASEAN region (ASEAN 2010, Ministry of Environment 2009). These threats are further exacerbated by misguided incentives such as the one that seeks to improve fishing fleet production by providing 1,000 new large boats.

Climate change is also being noticed in most parts of Indonesia. For marine and coastal resources, it threatens coastal populations with sea level rises and greater storm surges that damage homes and infrastructure, brings changes to sea surface temperatures and pH levels of sea water, which can have an impact on coral and fish populations and subsequently change where fish and other sea life can move as a result of currents. For terrestrial biodiversity and ecosystems, coping or adaptation responses in species may bring about migration, and/or higher incidences of disease and pest outbreaks as temperatures change. Habitats will be modified and species will adapt or falter. Human populations will also need to adapt. The most immediate terrestrial threat is probably from more extreme weather events from higher rainfall, more frequent drought, or both. Flooding will become more frequent, and forest fires more prevalent in Indonesia. Habitats (terrestrial, freshwater, coastal), and human livelihoods, will be at greater risk due to both of these threats that accompany climate change.

C. Indirect Threats

Although direct threats focus on changes to ecosystem processes (e.g., habitat change, fragmentation, or loss; overexploitation; and climate change), indirect threats focus on the underlying factors — social, economic, political, institutional, or cultural —that enable or add to the occurrence or persistence of direct threats and have a negative effect on biodiversity and forest conservation. Addressing indirect threats can influence the impact of direct threats.

One of the most significant indirect threats, for example, is poor and/or weak governance, e.g., inadequate coordination, conflicting policies and regulations, and corruption that prevents enforcement. Strengthening governance through actions such as improving coordination and enforcement of laws and regulations can mitigate the impact of direct threats such as land conversion and infrastructure development. In Indonesia, these underlying factors can provide opportunities for having a positive effect. Decentralization, for example, can have a negative effect (e.g., through inadequate consideration or understanding of the impact on the environment in granting concessions permits) or a positive one (e.g., through rigorous planning and monitoring and land-use planning that favors conservation and active civil society participation).

This assessment found numerous examples of both. In East Nusa Tenggara, provincial stakeholders have formed a tenacious ad hoc committee to guide, enhance, and drive the process need to create Indonesia's largest marine protected area, the Savu Sea MPA. Its members have helped to create awareness in the province of the benefits and the economic advantages that such an MPA will bring. An important lesson from this experience is that it has been long (10 years) in the making and not without protest or pain. But the stakeholders are numerous and committed, and they have the knowledge and experience to continue managing the process to the betterment of Nusa Tenggara Timur Province.

A provincial spatial plan developed with USAID assistance in Jayapura still has an uphill battle to "sell" its plan to the districts, but the region has an ownership of and commitment to its plan because it understands its nuts and bolts. Unlike the majority of spatial plans developed to date in Indonesia, this one was not farmed out to consultants who would complete it with little input from provincial stakeholders and then deliver it to sit on a BAPPEDA office shelf. The Papua plan engaged numerous stakeholders and had a systematic process that included hands-on training in its development so that officials are much better prepared to explain, revise, and argue for its adoption and use, as well as to prepare to make changes need to improve while it is in force.

In discussions with stakeholders, as another example of where addressing indirect threats can have an impact, the assessment team learned of district-level difficulties in protecting forests, biodiversity, and marine resources that were simply due to lack of capacity. In the first instance, they often lacked staff, and some had staff, but no training about the laws and policies affecting the resources in their district. In other instances, they lacked guidelines or management tools and techniques to address the resource issues. In other districts, the lack of funds or physical tools needed to collect the information necessary to understand and monitor what was happening to the resource hampered or prevented action. Without basic real-time information, a district cannot make informed decisions about managing resources and/or planning for wiser, more sustainable uses that more realistically value the resources in question. In almost every district, staff are ill-trained, badly equipped and/or not knowledgeable about enforcement rules and procedures that pertain to issuing permits, monitoring the resource, and how to effectively collect, maintain, and use the information.

The information on which to make decisions also needs to reliable, adequate, and as-up-to-date as possible in addition to being accessible. Bad (old, false, incomplete, weak) data lead to poor (and often wrong) decisions. In the marine sector, the catch date is poor and inaccurate. Only fishing sites are recorded, and production figures are a lot less than what is actually caught. Nautch and Lyons (2012) similarly note that poor information, data, and monitoring about wildlife species being traded in Indonesia lead to poor enforcement decisions. So it is not simply a data recording issue, but one of the monitoring system as well. Analytic procedures and research systems are also to blame. The fact that data and data sources are often weak, unconvincing, or inadequate in Indonesia severely limits the ability of decision-makers at national and local levels to make effective choices about resources, establish priorities and to create good policies and regulations.

In the process of preparing this assessment and in stakeholder consultations, nine indirect threats were identified, as summarized in Exhibit 11, with links to the direct threats noted in Exhibit 10.

Exhibit 11. Indirect Threats to Biodiversity and Forests in Indonesia and Links to Direct Threats

Indirect Threats		Links to Direct Threats
Governance	**Inadequate coordination and overlapping jurisdictions** to protect high conservation value habitats	Conversion (agriculture and aquaculture)
	Corruption and weak enforcement of laws, policies, and agreements related to natural resources	Overharvesting Unsustainable logging Conversion
Incentives and Business Practices	**Business practices are skewed or do not adequately consider** the full range of social and environmental impacts	Pollution Conversion Mining Unsustainable logging
	"Misguided" incentives and an undervaluation of goods and services provided by healthy ecosystems	Conversion Pollution Overharvesting Mining Infrastructure development
	Demand for unsustainably-sourced food, natural resources, energy, and consumer products	Overharvesting Development of hydropower Conversion Unsustainable logging
Capacity, Resources, and Data	**Development plans and priorities (medium and long terms) do not adequately consider ecosystem services** (forests and biodiversity)	Conversion Infrastructure development Mining Climate change
	Inadequate capacity at district level for development planning and management of natural resources.	Conversion Overharvesting Mining Infrastructure development
	Insufficient resources for natural resource and biodiversity conservation	Invasive species Overharvesting Pollution
	Weak/non-existent data coupled with uncoordinated analyses and research systems needed for understanding resources, priority setting, and effective policy/decision-making	Overharvesting Mining Unsustainable logging Pollution Conversion

V. ACTIONS NECESSARY TO CONSERVE BIODIVERSITY AND TROPICAL FORESTS IN INDONESIA

A. Overview

The previous sections detailed direct and indirect threats to biodiversity and forests in Indonesia. In this section, the actions necessary to conserve biodiversity are identified, keeping in mind the underlying causes (drivers) of forest and biodiversity loss. As mentioned above, direct threats focus on changes to ecosystem processes, indirect threats focus on the factors — usually social, economic, political, and institutional — that enable or add to the occurrence or persistence of direct threats. Indirect threats provide the clearest access for initiatives at economic, policy, and social levels. Efforts addressing these indirect threats can have a positive impact on mitigating the direct threats and help conserve biodiversity and sustainably manage forests in Indonesia. For this reason, this assessment focuses on actions that address the indirect threats. Exhibit 12 summarizes the links among indirect threats, direct threats, and the actions necessary. Detailed specific actions recommended are outlined in more detail below. These are general suggestions to address the threats identified in this report, which emerged in part from consultation with stakeholders in Indonesia. The actions are general suggestions for a wide range of stakeholders, rather than actions specifically recommended for USAID/Indonesia. A discussion of the extent to which the actions are being addressed is in Section VI and recommendations for USAID are presented in Section VII below.

Exhibit 12. Indirect Threats, Direct Threats, and Actions Necessary

Indirect Threats	Links to Direct Threats	Actions Necessary
Inadequate coordination and overlapping jurisdictions to protect high conservation value habitats	Conversion (agriculture and aquaculture) Mining	• Strengthen coordination and clarify/simplify jurisdiction (national, provincial, district) • Establish at the district level integrated planning and environmental safeguards
Corruption and weak enforcement of laws, policies, and agreements related to natural resources	Overharvesting Unsustainable logging Conversion Illegal mining Illegal fishing Destructive fishing	Strengthen commitment to enforcement at national and local (district) level and strengthen capacity for monitoring, compliance, and enforcement of natural resource laws and policies (including rule of law and justice)
Business practices are skewed or do not adequately consider the full range of social and environmental impact	Pollution Conversion Mining Unsustainable logging	Encourage the private sector to adopt best practices and use strong social and environmental safeguards (incentive-based approach to meet market demand for certification)
"Misguided" incentives and an undervaluation of goods and services provided by healthy ecosystems	Conversion Pollution Overharvesting Mining Infrastructure development	• Valuation of ecosystem services incorporated into development planning and business practices at national and district levels • Public advocacy and awareness campaign to all stakeholders on the value of ecosystem services and importance of effective environment governance
Demand for unsustainably sourced food, natural resources, energy, and consumer products	Overharvesting Development of hydropower Conversion Unsustainable logging	Adoption of international/national certification, transform consumer attitudes and behaviors to support sustainable products and processes

Indirect Threats	Links to Direct Threats	Actions Necessary
Development plans and priorities (medium and long terms) do not adequately consider ecosystem services (forests and biodiversity)	Conversion Infrastructure development Mining Climate change	• Build capacity and promote integrated spatial planning, especially at the district level, which includes sustainable resource management, including climate change, energy, and food security • Establish incentive system to encourage stakeholders (provincial and district) to conserve and protect natural resources
Inadequate capacity at district level for development planning and management of natural resources.	Conversion Overharvesting Mining Infrastructure development	Enhance capacity by including district managers training by the Ministry of Home Affairs the access and use of information (e.g., geospatial information), environment management planning, and support for monitoring
Insufficient resources for natural resource and biodiversity conservation	Conversion Mining Overharvesting Pollution	Enhance sustainable financing for conservation from public (through increased revenue and support) and private sectors (e.g., fees, licensing, and PES).
Weak/non-existent data coupled with uncoordinated analyses and research systems needed for understanding resources, priority setting, and effective policy-/decision-making	Overharvesting Mining Conversion Climate change Pollution Unsustainable logging	Promote applied research to inform policy and management practices and support decision-making and enhance dissemination of existing information

The changing expectations of civil society, aspirations of the Indonesian government, and changing face of the private sector present new opportunities for alliances for conservation and sustainable development. The expectation and values of an emerging middle class provide an opportunity to build an active constituency that will support actions to safeguard the environment. In its striving to be recognized as a modern democratic nation — an international and regional player — Indonesia is assuming a leadership role in regional environmental initiatives, such as the Coral Triangle Initiative, and has proven responsive to global concern about its forest-based emissions. The private sector is strengthening its corporate social responsibility commitments, and industries involved in commercial crops, such as oil palm, are developing certification schemes for sustainable production. These emerging opportunities for new alliances were considered when determining the actions necessary to address threats to Indonesia's biodiversity and forests.

B. Actions Necessary

Strengthen coordination and clarify/simplify jurisdiction (national, provincial, district, and sectoral). Policies and administrative procedures are determined at the national level with regulations promulgated by the government (legislature), president, regulations (*Perpres*), decrees (*Keppres*), and instructions (*Inpres*), and by ministries (primarily technical regulations, yet implementation of many provisions take place at the district level, where implementation may result in unintended consequences (e.g., the explosion of mining permits cited in Section III). Another issue is that ministries may have overlapping mandates, e.g., forestry, energy and mineral resources, and agriculture, which may result in conflict over conserving forests, establishing plantations, and conducting mining in the same area. An additional issue is effective management for resource (e.g, fisheries and marine resources) that occur in more than one authority's jurisdiction. Specific actions could include:

- Assessments of the impact of recent environmental regulations (e.g., Law No 23/2010 on mineral and coal mining, Law No 32/2009 on environmental management and protection) on sustainable management of natural resources.
- Finalize provincial spatial planning as a basis to overcome land use conflict in use of an area and support district level spatial planning (see below).
- Build cross-jurisdictional networks on shared resources.

Establish, at the district level, integrated planning and environmental safeguards. Districts are key to the conservation of forests and biodiversity, yet conservation is not included in local planning and environmental safeguards, including areas for conservation and environmental impact assessments. Specific actions could include:

- Develop and implement a common vision and commitment in districts, especially in areas of high-value conservation and forests such as Papua, for management and conservation of natural ecosystems (forests and biodiversity, marine, and terrestrial), including attention to the social and environmental impact of development activities and the specific impact on women. Improve coordination at the district level among line agencies (e.g., ministries of forestry, marine affairs and fisheries, agriculture) to avoid overlaps in land use planning and provide appropriate technical support to districts.

Build capacity and promote integrated spatial planning, especially at the district level, which includes sustainable resource management, including climate change, energy, and food security. In Indonesia, economic growth goals take priority over social and environmental goals and safeguards. Integrated planning for sustainable, long-term development would provide guidance at the national, provincial, and district levels on how to best meet the demand for economic growth, food, and energy while building climate change resilience and conserving biodiversity and natural resources. An example of where integration is critically needed is development of infrastructure, a key component of economic development plans such as the MP3EI, in linking areas of production (mining, agriculture, etc.) to processing facilities. Planners should consider not just transportation logistics, but also the "footprint" on biodiversity, agriculture, fisheries, livelihoods, health, watersheds, and forests. Illustrative actions include:

- Ensure that government planning agencies, such as the Coordinating Ministry for Economic Affairs, integrate conservation into planning processes.
- Ensure that development initiatives consider conservation of biodiversity, infrastructure development does not fragment protected areas, migration corridors are maintained, national protected area systems are not opened to mining and resource exploitation, and protected areas and rehabilitation of habitats, e.g., mangroves, are recognized and included in climate change resilience strategies.
- Plan and implement climate change mitigation efforts such as REDD+ in ways that also strengthen biodiversity conservation, gender equity, and resilience.
- Ensure that information used in budget allocations — including land use planning and zonation laws; forest, agriculture, and mining concession agreements; and plans for infrastructure projects — is publicly available and readily accessible.

- Integrate gender considerations into all aspects of development planning, recognizing women as key managers of natural resources.

Establish an incentive system to encourage stakeholders (provincial and district) to conserve and protect natural resources. There are incentives (fees, licenses, payments) for exploitation and unsustainable use, but not for conservation and protection. To counter this, a system is needed that will provide tangible benefits for conservation. Illustrative actions may include:

- Increase special allocations from MOHA for areas set aside for conservation and/or for additional allocation for staff for surveillance and monitoring of local protected areas.

Strengthen commitment to enforcement at national and local (district) level and strengthen capacity for monitoring, compliance, and enforcement of natural resource laws and policies (including rule of law and justice), strengthen regional monitoring, compliance, and enforcement of natural resource laws and policies. Indonesia has signed several international agreements related to biodiversity (see Annex G), and has environmental impact assessment requirements for development activities. The challenge is for these agreements and requirements to be put into practice. This requires a renewed commitment to international biodiversity agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora; higher prioritization of environment and biodiversity protection, as reflected not only in increased allocation of human and financial resources, but also in effective enforcement; and a commitment to reducing corruption. Illustrative actions include:

- Strengthen coordinated law enforcement efforts by networking existing regional and national platforms and community organizations and improving the sharing of information among relevant agencies.
- Strengthen civil society, academia, and the media to play leading roles as watchdogs monitoring compliance with and enforcement of biodiversity conservation policies, laws, and regulations (see also dissemination of information below).

Encourage the private sector to adopt best practices and employ strong social and environmental safeguard (incentive based approach to meet market demand for certification) Social and environmental safeguards are "on the books," but compliance is not always enforced or even expected. However, the increased availability of information is leading to a change in public opinion. Large companies are strengthening their corporate social responsibility commitments, and industries involved in commercial crops, such as oil palm, are developing certification schemes for sustainable production that include social and environmental safeguards. Illustrative actions include:

- Encourage adoption of and compliance with environmental regulations by the private sector, through fines that are high enough to act as a deterrent for noncompliance and through public reporting of noncompliance.
- Promote private sector adoption of sustainable sourcing, procurement, and greening of supply chains, including independent certification systems for major natural resource products such as timber, palm oil, rubber, shrimp, fisheries, and other commercial crops and products. These systems should include social and environmental safeguards.

- Provide incentives, e.g., through taxes, to increase investment in sustainable production systems and to transition away from unsustainable natural resource extraction.

Enhance capacity in the access and use of information (e.g., geospatial information), environment management planning, and support for monitoring in district managers training by the Ministry of Home Affairs. District managers receive training by MOHA in administration and budgeting, but little to none in environmental planning or use of geospatial information as a tool for planning and monitoring. (USAID IFACS has provided capacity building training in targeted districts and the German Society for International Cooperation (GiZ) and the Asia Foundation are working in several districts, but there is no coordination or comprehensive plan to do anything beyond this),.Given this, illustrative actions include:

- Facilitate development of training material/modules by MOHA (in collaboration with the ministries of forestry and environment) on environment management planning (including conservation, ecosystems services, and environmental impact assessments) and geospatial mapping that can be incorporated into district training.
- Provide information and build capacity on biodiversity monitoring, mapping, GIS at the island, national, and district levels.

Valuation of ecosystem services incorporated into development planning and business practices at the national and district levels. Ecosystems services such as clean water, animal and plant habitats, and regulation of water cycles are often not considered or are undervalued when development initiatives are being planned at the national, provincial, and district levels. Ecosystem valuation can establish an understanding of the services provided, their value, the cost consequences of losing them if these services are degraded, and the cost of the actions to reduce environmental impact. One approach to incorporate ecosystem services into decision-making is to develop markets that value and trade in these services. This is what is being attempted with forest carbon sequestration under REDD+ programs. Illustrative actions include:

- Strengthen capacities of government agencies, the private sector, and civil society to conduct environmental valuation and cost/benefit analyses.
- Develop payment of ecosystem services mechanisms at island, provincial, and district levels, such as water in which users pay for the services provided.

Public advocacy and awareness campaign to all stakeholders on the value of ecosystem services and importance of effective environment governance. To create support for improving environmental governance the public needs to have an understanding of the importance of ecosystems, the benefits provided (e.g., water, climate resilience), and the costs of degradation. Illustrative actions include:

- Public awareness campaigns through radio, newspapers, and community and vocational associations (e.g., farmers associations, fisherman associations) on the importance and value of ecosystem services and benefits that promote active engagement in improving environment governance.

- Targeted campaigns through local schools that promote conservation and encourage students to become involved in using local conservation areas as "living laboratories" for studying biodiversity and natural ecosystems.

Enhance sustainable financing for conservation from public (through increased revenue and support) and private sectors (e.g., fees, licensing, and PES). The under-resourcing of environmental conservation has resulted in ineffective management of protected areas (some being "paper" rather than actual). Even with the rising prosperity in Indonesia, the Ministry of Environment and Ministry of Forestry must compete with other sectors for additional funding; an estimated one percent of the government's budget is allocated for environment. Valuation of the contribution of healthy ecosystems to the economy (see above) can assist in creating a constituency for conservation, as well as a potential market for PES. Illustrative actions include:

- Increase national investment (national, provincial, and district budget allocation) in conservation, especially in areas of high biodiversity and under threat from development, such as Papua, and maintain the focus on fragile peat lands.
- Implement sustainable conservation financing initiatives (e.g., PES, REDD+, biodiversity offsets/banking) to generate investments from service buyers to support protected area systems, conservation, and enforcement.
- Institutionalize incentives for private companies, such as tax and regulatory relief, to establish, maintain, and invest in conservation areas and sustainable management and provide sustainable financing.

Adoption of international/national certification and transform consumer attitudes and behaviors to support sustainable products and processes. Market demand for certified products creates a strong incentive for meeting international/national standards and has the potential for making a major positive environmental impact. In domestic markets, Indonesian consumers are often unaware of the impact, and even if aware, are usually more interested in low prices than the environmental costs. Illustrative actions include:

- Promote consumer awareness and adoption of products that are sustainably sourced, including certification systems for major natural resource products such as timber, palm oil, rubber, shrimp, fisheries, and other commercial crops and products.
- Change cultural attitudes and consumption patterns to reduce consumer demand for threatened and endangered species and other illegal products.
- Strengthen efforts to build public awareness of the value of biodiversity and sustainable use of natural resources by national and international environmental advocacy organizations.

Promote applied research to inform policy and management practices and to support decision-making and enhance dissemination of existing information. The lack of science-based information in the hands of trained technical practitioners hinders national, provincial, and district planning, monitoring, and implementation of sustainable natural resource management. Illustrative actions include:

- Strengthen national biodiversity monitoring systems to track species and ecosystem status, trends, and threats and to inform more proactive responses.

- Carry out research on sustainable harvest rates, linking them to appropriate policies and enforcement at the island, provincial, and district levels to inform development planning. Disseminate science-based information through easily accessible media and environmental journalism targeting scientific community, policy-makers, local decision-makers, and civil society.
- Provide guidelines, tools, and training to allow stakeholders to effectively use information at local and national levels.

VI. EXTENT TO WHICH INDONESIA IS ADDRESSING THE NECESSARY ACTIONS

The previous section outlined the actions deemed necessary to address, in a practical sense, the threats to biodiversity and tropical forests in Indonesia. It was pointed out that the most effective avenues would be actions and activities that involve addressing indirect threats identified in this assessment. By tackling the indirect ones, there would be a positive impact on the mitigation of the direct threats.

The summary in this section focuses on the extent to which actions identified in Section V are ongoing (or planned) by U.S. government agencies and USAID/Indonesia. What others (NGOs and other donors) are doing comes into play when there are opportunities for complementarity and/or leveraging resources or to learn from their experiences and actions. Annex I provides brief descriptions of what other institutions/organizations are undertaking related to biodiversity and tropical forests in Indonesia.

The contribution of NGO and donor technical assistance in biodiversity and tropical forest conservation is small compared to Indonesia's overall budget. But the scope and number of activities of these efforts is immense and extends into every corner of the country. The effects of this assistance, which occurs at the national, regional, district, village, and even the homestead level, cannot often be fully calculated until years later. USAID has been active in biodiversity and tropical forest conservation for more than 25 years. There were several instances where the assessment team interviewed stakeholders who recalled either being a part of those efforts more than two decades ago or who had positive things to say about their contribution to Indonesia's efforts to be better stewards of its unique natural heritage.

A. District-Level Integrated Planning

Indonesian laws and policies, including MOHA's directives aimed at sustainable development approaches for local government strategic planning, stipulate that integrated planning is required. Inventorying environmental attributes is part of the process as is developing plans surrounding their use and conservation. The USAID IFACS project has activities aimed at supporting and helping targeted districts in eight landscapes to develop their plans and improve their spatial planning capacities. Engaging provincial stakeholders, where practical, is also part of this process under IFACS.

IMACS and MPAG have undertaken numerous district- and province-level activities that have focused on coordination, information sharing, and adaptive management strategies. IMACS has also worked extensively with MMAF as an interlocutor to harmonize cooperation and coordination between the national and district levels.

GiZ is also undertaking targeted spatial planning support in specific districts, mainly with GIS equipment and software training. The assessment team learned that this is part of its Forests and Climate Change Programme initiative in Aceh Tenggara. The Asia Foundation is also looking to

support district-level spatial planning efforts as part of its new environmental governance program.

B. Building and Promoting District-Level Capacity in Spatial Planning and Sustainable Resource Management

USAID IFACS again has a strong component with dedicated specialists and advisors in eight landscapes who are attuned and engaged in building local capacity at the local level. It is not known to what extent they coordinate their activities with the Coordinating Ministry for Economic Affair or with MOHA. They have established, signed memoranda of understanding with the provinces where they are active and the *bupatis* in the districts they work in. Resources management, low emission development strategy, and climate change mitigation all figure into their program. The project's activities are limited to predetermined districts. IFACS noted that getting established on the ground and becoming trusted colleagues has taken more than a year, but each month shows improvements in their activities. The U.S. Forest Service has also cooperated with IFACS in Kalimantan, Papua, and Sumatra to conduct awareness and hands-on workshops about forest fires (especially on peat land) and spatial planning linked directly to working with local communities to develop forest use plans.

The USAID supported MPAG also works with districts linked to target MPAs. The assessment team witnessed a successful coordination effort for establishment of a new (and Indonesia's largest) marine protected area in the Savu Sea. The Nature Conservancy is helping to implement this activity and acknowledges that establishing trust and the continued working knowledge and coordination of a variety of stakeholders has been its biggest challenge in the 10-year process. MPAG is also assisting the MMAF to develop a national marine protected area system, beginning with eight pilot sites focused in the eastern areas of the archipelago.

The USAID IUWASH Project, as well as IFACS and IMACS, has conducted climate change adaptation workshops in numerous districts where it works engaging stakeholders from a broad cross-section of the district populations. The IUWASH project has also published a guidelines document that should facilitate future district-level climate change adaptation exercises. IUWASH and IFACS used models for adaptation exercises developed and used successfully by USAID in other countries.

The National Oceanic and Atmospheric Administration is providing technical expertise to support capacity building for the MMAF, marine protected area practitioners in priority Indonesia landscapes, and fisheries resource managers. NOAA assistance is also developing a body of curriculum and training methodology to support on-going capacity building for marine protected area practitioners in Indonesia.

C. Strengthen Commitment to Enforcement at National and Local Levels

On prior occasions, USAID/Indonesia has engaged Department of Justice specialists and U.S. Forest Service personnel on law enforcement related to forest product chain of custody regulations. There were national-level workshops aimed at building awareness about the Lacey Act in relation to companies wanting to sell their products to U.S. companies and markets. Districts were not involved. The USAID Changes for Justice project has recently added a

component to its portfolio to engage the Indonesia Attorney General's Office and targeted courts in specific provinces. The objective is to build court capacity to handle cases related to illegal forestland conversion, wildlife trade, and illegal logging. This will also be accompanied by an awareness-building effort to encourage this type of litigation activity and to increase the transparency of laws surrounding the protection of forests and biodiversity.

USAID IMACS is also working with the MMAF to increase awareness of national and international fisheries laws and is exploring avenues to ensure that Indonesia becomes more effective at honoring its adherence to international treaties and conventions.

D. Encourage the Private Sector to Adopt Best Management Practices

Both USAID IMACS and IFACS projects have best management practices components or they have worked with the private sector to enhance best management practices for forestry including logging techniques, a palm oil plantation establishment and management for the IFACS activities, and best management practices linked to surveillance, equipment, and employing the Ecosystem Fisheries Management Tool in the fisheries sector. Similarly the Indonesian Biodiversity Foundation (KEHATI), in its oversight activities for the USAID-funded Tropical Forestry Conservation Act (TFCA) grants, works to use these practices with the private sector groups that it works with. It has also developed a Green Index for the Indonesia Stock Exchange that can be used as a company filter for firms listed on the exchange to indicate their level of involvement in eco-friendly business practices.

Forest product certification work is not within the purview of any current USAID-funded activities. The U.K. Department for International Development (DFID) is working with the MOF and private sector companies to have an EU-FLEGT approved certification process for Indonesian forest products implemented and successfully audited before to the end of 2013. They have been engaged in this process for more than seven years. It is close to being successful, and this will have important ramifications for the forest industry and Indonesia in Europe's eyes and globally as well.

USAID IMACS works to encourage private sector entrepreneurs to adopt best management practices at numerous levels to help add value to Indonesia's aquatic production systems.

E. Enhance Capacity in the Access and Use of Geospatial Information

As was previously noted (under subsections A and B above) USAID, IFACS, GiZ, and the Asia Foundation are known to have conducted this type of training for district managers. MOHA was probably not involved. To provide systematic, cohesive, and uniform training, it needs be a part of the MOHA technical package. This is similar to U.S. government-sponsored training given to Environment Protection Agency employees and most government units. Everyone receives the same information and it is done uniformly, periodically, and often without exception so that technical specialists can make decisions based on more complete and uniform knowledge.

The USFS is working with the Indonesia National Mapping Agency to develop a common national database of digitized satellite data in a project called OneMap that can be used across ministries and agencies and down to at least the province level. Pilot efforts are also being

actively explored with USAID, the National Mapping Agency, and IFACS to look at the environmental mapping and planning uses of this information at the district level. This would mean another level of budgeting, but the benefits and empowerment possibilities to districts could be extraordinary.

F. Incorporate the Valuation of Ecosystem Services into Planning and Business Practices

IFACS and IMACS work with provincial and district stakeholders, including multi-stakeholder groups to enhance awareness about the value of existing ecosystem services within their project areas. In Gayo Lues, the assessment team learned that the *kabupaten* was aware of the value of its resources, especially water, to downstream districts and populations. It saw itself as a steward of the resource and also as a potential recipient of funds created to paying Gayo Lues to maintain its watersheds and catchment areas. Another population in Aceh Selatan is waiting for the REDD+ Directive so it can "collect carbon funds" in exchange for keeping its swamp forest intact.

IMACS also works at the national level with the MMAF to develop policies that enhance aquatic production systems. They are helping on numerous fronts to promote Indonesia's Blue Economy that has valuation of ecosystem services at its core.

G. Enhance Sustainable Financing for Conservation

MPAG and IMACS each have sustainable financing activities in their portfolios. Both programs are working with MMAF in efforts of sustainable fisheries management, marine protected area management, and coastal community resiliency. Experiences and lessons learned from these cutting-edge activities are also being shared with other CTI countries.

Conservation financing, through debt-swapping mechanisms, has also been bolstered by U.S. government efforts through TFCA I and TFCA II. Direct and indirect financing through tourism development has also been component of MPAG and IMACS, such as the ongoing work in Wakatobi National Park, and more indirectly through the considerations of tourism in the spatial planning training and advice via the IFACS program.

MPAG is supporting the MMAF directorate general of coastal marine and small islands at the national level in the preparation of a trust fund for conservation and specifically for management of marine protected areas. At other sites (Berau, Wakatobi, and Anambus), it has worked with district- and community-level stakeholders to provide inputs to tourism development plans, ecotourism activities, and the engagement of private sector entrepreneurs to improve financing options for marine protected area activities.

H. Adoption of International/National Certification to Transform Consumer Behaviors

Although not linked to a specific certification effort, the IMACS program is working on numerous fronts (district, regional, national, and international) to change behaviors and perceptions of the "Indonesia brand" linked to fisheries. These are multi-faceted activities that taken together look to change policies, perceptions, and behavior linked to management of the nation's marine, cage culture, and pond-culture fisheries, and ultimately to put a higher value on

the Indonesia product. An important part of this is showing that Indonesia can transparently manage its fisheries according to globally recognized standards and norms and also reduce the incidences of illegal, unreported, and unregulated catches. The team did not encounter other organizations actively engaged in promoting natural products that relied on a certification process

In Gayo Lues, an IFACS grantee is manufacturing organic essential oils (lemon grass, and patchouli), and this entrepreneur is sensitive to Global Gap standards being applied to the product so that it can be assured of selling in the European market. Though the Indonesia market has not yet begun demanding that eco-friendly standards accompany the products that it sells.

Similarly, another IFACS grantee is working to transform cacao farmer behaviors to more readily adopt organic cultivation methods and to be more sensitive to the environment and the higher standards demanded in the value chains of exported products.

I. Promote Applied Research to Inform Policy and Management Practices

Most activities undertaken with U.S. government support in the environment sector have strong, science-based grounding. As such, this assistance provides leadership examples and lessons learned illustrating the value of monitored, solid data, and transparent, rigorous collection systems to decision-making.

IMACS and IFACS are working with the MMAF and other stakeholders to promote better data collection and monitoring systems that are understood by more than one stakeholder. IMACS is a strong champion for independent observers on fishing fleet boats to ensure that the correct data are recorded and transparently reported. Similarly, they are working with the MMAF to improve boat registration and licensing, along with the tracking and monitoring according to international standards. Both programs recognize that fisheries catch (production) data are very weak and require a substantial overhaul to be effective and meaningful for better decision-making and policy formulation.

IMACS has promoted development of a Fisheries Data Management Committee where government, local universities, and private sector partners collaborate to collect and interpret data on fishing practices and catch composition. Early in 2012, the provincial fisheries service of Nusa Tenggara Timur established the Fisheries Data Management Committee through a decree of the head of DKP Nusa Tenggara Barat. This is a significant first step toward a group that will engage in collaborative management of this fishery through public-private partnerships.

MPAG strongly supports the research, reporting, and dissemination of results that are ongoing with Indonesia's CTI activities. It has used this information with fisherman's associations and other stakeholders at many of its sites (Berau, Kandari, and Kupang) to illustrate the costs and benefits of particular catch and management practices.

NOAA is continuing to collect science-based information collected from experience within the Coral Triangle and elsewhere in its development of training modules that emphasize the critical importance of solid, verifiable data for policy-making and decision-making.

Many TFCA grants and grants under contract (IMACS, IUWASH, and others) stress the importance of careful data collection and monitoring. Training activities linked to mapping and spatial planning under the IFACS program have modules dedicated to data collection, data monitoring, and the utility of specific data sets for district-level managers and how these data contribute to better planning and land-use decisions.

The OneMap effort, supported by the USFS, is steeped in the necessities of data collection, data storage, and data monitoring and sharing. These activities demand valid and reliable information so that decision- and policy-making at national and regional levels is effective and transparent.

VII. RECOMMENDATIONS

A. Overview

The development of USAID/Indonesia's new five-year (2013-2018) Country Development Cooperation Strategy presents an opportunity for the mission's investments and strategic objectives to better incorporate biodiversity and forest conservation into the planning process and to consider USAID Forward reforms related to building local capacity, innovation, science and technology, and private sector engagement. This should be done with an eye toward the rapid changes that will be occurring in Indonesia during this period, especially the potential impact on areas of high biodiversity value, forests and marine resources of Indonesia's long-term economic development plans, and designated geographic areas for investment and development. Indonesia's biodiversity, forests, marine resources, and freshwater will be under greater threat than ever before.

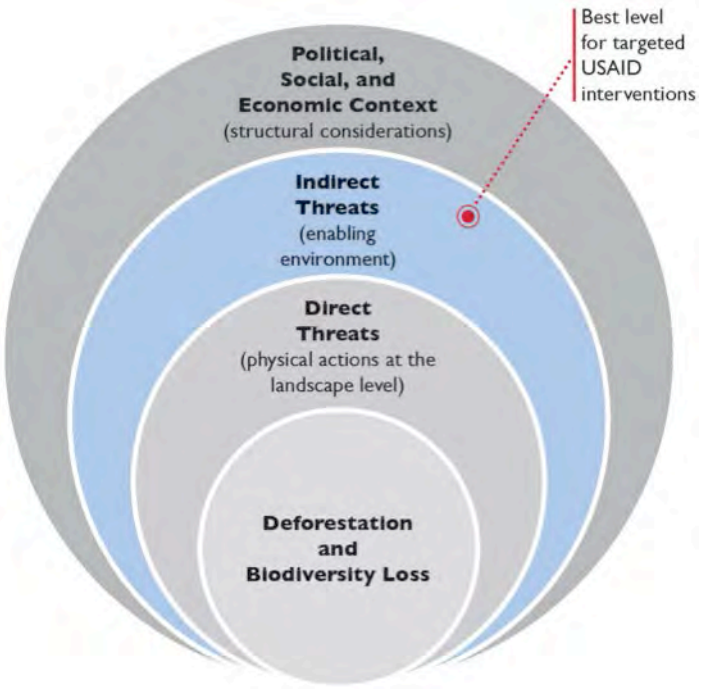
It is likely, for example, that Papua — Indonesia's last frontier — will encounter far-reaching pressures in its forests and coastal areas through expanding infrastructure, roads and ports, commercial agriculture, oil and gas exploration and production, and copper and nickel mining. It can be expected that there will be an acceleration in the process of releasing designated forest land into food estate areas; that implementation of Law No.4/2009 on mineral and coal mining will encourage mining and allocation of mining zones for Papua Provincial Spatial Plan; and that local governments will be eager to enter into agreements for oil, gas, and mineral revenue-sharing as well as plantation agriculture. This drive to develop Papua's resources, coupled with the relatively weak capacity of the Papua government — especially at the district level — is likely to result in the rapid degradation of biodiversity, forests, and marine and freshwater resources if steps are not taken at the national and local levels. At the national level, it is necessary to build political commitment and improve policy to support sustainable natural resource management not just in Papua, but throughout Indonesia. At the local level, Papuan local capacity needs to be strengthened for sustainable development planning and investing in its natural resources and people, e.g., education and health (as noted in Section III, Papua has the lowest life expectancy, highest rate of HIV, and lowest literacy rate in Indonesia). USAID should also recognize that while the special autonomy of Papua and Aceh provides opportunities for engagement, it also has inherent perverse incentives, such as the 70 percent of revenue from natural resources development that encourages unsustainable natural resource exploitation.

Other factors for USAID to consider are strategic support and long-term commitment. In the complexity that is Indonesia, aid could easily be too diffused to have an impact, could miss the mark by focusing on interventions that are not replicable, duplicate rather than complement other programs, or run counter to prevailing policies. At the national level, the government is planning on a 10-year to 15-year horizon, and USAID assistance should consider strengthening areas (e.g., transparency, addressing corruption) that will support sustainable growth. A challenge will be to assist the government, civil society, and the private sector to view Indonesia's economic growth through a lens that takes into consideration that the cost of prosperity if unchecked may include irredeemable destruction of its natural resources and the undermining of its economy. This will require an articulated effort that targets critical stakeholders and provides models and examples of how to affect change, such as private sector adoption of best practices through a combination

of incentives (i.e., tax rates, access to markets) and disincentives (fines for non-compliance, requirements with environmental and social safeguards). Also to be considered is how to best engage with civil society. Civil society organizations have dramatically increased in number and focal areas of concern (see Section III), with environment coming to the fore in some locations. CSOs vary widely in capacity, validity, and stability. Initial engagement through civil society platforms, such as Forum Kerjasama Lembaga Swadaya Masyarakat in Papua, which is undertaking an assessment of its members, may be a good first step when moving into new locations. It is likely that local organizations in relatively remote forest and coastal areas, especially in provinces such as Papua, will need substantial capacity building and mentoring. Although it may take significant time to effectively engage with stakeholders, build capacity through hands-on training, and create ownership, it is time well spent, as the example of East Nusa Tenggara (Section IV) shows.

Although to some extent, Indonesia's current environmental activities address nine actions identified as necessary to conserve biodiversity and tropical forests, looking to the future, gaps as well as opportunities to enhance programmatic impact through the new country development cooperation strategy are noted below.

Exhibit 13. Recommended Level for USAID Interventions in Biodiversity and Tropical Forests



As previously noted (see Section IV), efforts to address direct threats, such as conversion of forests into agricultural plantations and overharvesting and destructive fishing, will be unsuccessful if the underlying social, economic, and political factors — the indirect threats — that facilitate and enable them are not effectively addressed. By focusing on the most significant indirect threats, USAID can mitigate the impact of direct threats and have the greatest impact. For this reason, the recommendations concentrate on actions that address the major indirect threats (see Exhibits 13 and 14), such as weak governance and enforcement that enable these direct threats to continue.

USAID should consider which appropriate approach and actions — its environment niche — will have the most effective impact in conserving biodiversity, marine and terrestrial resources, and forests within the context of the Indonesian government's priorities, other donor strategies and actions, and private sector investment. In a large, complex, rapidly developing archipelago country such as Indonesia, targeting and leveraging interventions is essential and challenging. It is also important to recognize and promote the cross-sectoral links between biodiversity and other sectors, including health, education, economic growth and trade, and governance and the rule of law, as well as

women and other vulnerable populations. USAID's programs across the sectors should work to balance rapid economic development with conservation.

B. Recommendations

USAID/Indonesia can make a significant contribution in conserving Indonesia's biodiversity and tropical forest. Based on the findings of this assessment, the following recommendations focus on the key underlying factors — which can be clustered as weak governance and enforcement, perverse incentives and poor business practices, and inadequate capacity, resources and information — that are supporting the degradation and destruction of Indonesia's rich biological heritage. Informed by the accomplishments and lessons learned from USAID projects, the recommendations suggest new program activities as well as the continuation of current successful activities.

The recommendations (see Exhibit 14) are presented as *higher priority* and *priority* — the higher priority being designated as interventions that have potential for the greatest impact in conserving Indonesia's biodiversity and forests by addressing the key underlying causes of environmental loss and degradation and contributing to the conservation of key high biodiversity and forest value areas. Critical in prioritizing USAID's interventions is the dynamic interplay between the *what* (e.g., objective), *where* (e.g., geographic location, priority ecosystems), and *how* (e.g., thematic area, local government, role of civil society) in conserving biodiversity and forests. Exhibit 14, below briefly articulates suggested higher-priority and priority recommendations that address indirect threats.

Exhibit 14. Indirect Threats, Direct Threats, and Recommendations

Indirect Threats		Links to Direct Threats	Recommendations
Governance	**Inadequate coordination and overlapping jurisdictions** to protect high conservation value habitats.	Conversion (agriculture and aquaculture) Mining	**Higher priority** • *Strengthen local governance (district):* two-pronged approach: facilitate development of guidelines for districts on environmental management (Ministry of Home Affairs) with technical assistance by ministries of forestry, environment, maritime affairs, and fisheries; pilot guideline adoption at the district level
	Corruption and weak enforcement of laws, policies, and agreements related to natural resources.	Overharvesting Unsustainable logging Conversion Ilegal mining Illegal fishing Destructive fishing	**Higher priority** • *Governance and the rule of law:* build on past and current initiatives to strengthen capacity for enforcement in surveillance, bringing to justice, and compliance; support compliance with new laws at district and provincial levels to promote compliance by plantation companies **Priority** • *Wildlife trafficking:* promote full implementation of existing legal procedures, increased accountability, and educating/awareness of importance of biodiversity

	Indirect Threats	Links to Direct Threats	Recommendations
Incentives and Business Practices	**Business practices are skewed or do not adequately consider** the full range of social and environmental impact.	Pollution Conversion Mining Unsustainable logging	**Priority** • *Stimulate public-private partnerships for conservation:* encourage private sector to adopt best practices and use strong social and environmental safeguards • *Vulnerable populations: support local rights to resources* and promote more community-based approaches, ensure that vulnerable populations, such as in Papua, have access to benefits, supported by rights and tolls to sustainably use them
	"Misguided" incentives and an undervaluation of goods and services provided by healthy ecosystems.	Conversion Pollution Overharvesting Mining Infrastructure development	**Priority** • *Agriculture and food security: promote and facilitate awareness and action to hinder the conversion of natural ecosystems*, especially high conservation value, to commercial plantations and aquaculture (including USAID programs) • *Raise awareness and improve communication* about the importance of ecosystem services, biodiversity, and forests to stimulate greater local and national ownership
	Demand for unsustainably sourced food, natural resources, energy, and consumer products.	Overharvesting Development of hydropower Conversion Unsustainable logging	**Priority** • *Stimulate public-private partnerships for conservation:* encourage voluntary private sector certification initiatives; support and stimulate pro-conservation business ventures (ecotourism, PES) • *Raise awareness and improve communication* about the importance of ecosystem services, biodiversity, and forests to stimulate greater local and national ownership
Capacity, Resources, and Data	**Development plans and priorities (medium and long terms) do not adequately consider ecosystem services** (forests and biodiversity).	Conversion Infrastructure development Mining Climate change	**Higher priority** • *Climate change, conservation and rights:* support conservation of biodiversity and natural forests, not just carbon, in REDD+ programs **Priority** • *Mainstream climate change across the mission's portfolio*: develop activities that will help communities adapt to climate change *Collaborative activity: (leverage influence and resources)* • *ASEAN: develop a comprehensive strategy* that will encourage eco-friendly policies and practices in Indonesia (especially for major industrial crops) • *Blue Economy activities:* expand support of IMACS and future marine conservation activities to support Indonesia's Blue Economy
	Inadequate capacity at district level for development planning and management of natural resources.	Conversion Overharvesting Mining Infrastructure development	**Higher priority** • *Strengthen local governance (district):* two-pronged approach: facilitate development of guidelines for districts on environmental management (Ministry of Home Affairs) with technical assistance by ministries of forestry, environment, maritime affairs, and fisheries; pilot the guideline adoption at the district level **Priority** • *Invest in systematic geospatial mapping and monitoring:* ensure there is a trained cadre at provincial and district levels that can use geospatial data and indicators on a daily basis

Indirect Threats		Links to Direct Threats	Recommendations
Capacity, Resources, and Data	**Insufficient resources** for natural resource and biodiversity conservation.	Conversion Mining Overharvesting Pollution	**Priority** • *Strengthen support to marine and fisheries conservation:* build on achievements and lessons learned under IMACS and MPAG, use best practices, and harmonize policies; develop new initiatives and strengthen collaboration between MMAF and CTI to share information, promote research, and improve modeling *Collaborative activity (leveraging resources)* • *Coral Triangle Initiative: continue to strategically support emerging governance systems* and deepen connections in generation of policies, information, and networks and improving governance
	Weak/non-existent data coupled with uncoordinated analyses and research systems needed for understanding resources, priority setting, and effective policy-making/decision-making.	Overharvesting Mining Conversion Climate change Pollution Unsustainable logging	**Priority** • *Invest in systematic geospatial mapping and monitoring:* build on U.S. government support for OneMap to improve monitoring of biodiversity threats and national development trends and expand to include data and indicators related to health, economic growth, governance, climate change, etc. • *Environmental education and research*: enhance environmental studies; importance of biodiversity for healthy ecosystems and sustainable development; integration of environment into development planning, valuation of ecosystem service

*Recommendations may address multiple indirect threats.

Underpinning the priorities is the *geographic focus of activities*, and in a complex archipelago country such as Indonesia, *where* to focus activities depends on the objective and purpose of the initiative. From the standpoint of conserving biodiversity and forests, priority geographic areas will be those of high biodiversity and conservation value that are and/or will be facing increasing pressure from development, such as conversion of forest, mining, and expansion of infrastructure.

If the mission determines that support to high conservation value areas facing development pressures is a major objective, then an area such as Papua (including West Papua) is a priority. About 50 percent of Indonesia's biodiversity is in Papua. Until recently, there was relatively little deforestation, however, as noted in this report, this is likely to change as development plans for expanded infrastructure, agricultural estates, and mining are implemented and marine resources further stressed with expanded fisheries. However, Papua presents a number of challenges. Reflecting competing priorities and policy and political risks, current and past involvement by donors and environmental NGOs is far lower in Papua than in Kalimantan or Sumatra (Haarstad et al. 2009). The capacity of local and provincial governments is acknowledged to be weak, and although there are exceptions, the assessment team found that local NGOs would need substantial capacity building as well. The fragmentary and inconsistent data /paucity of information and sources will require assessments and rigorous baseline studies to generate data that can be used to monitor and evaluate the impact of projects and interventions on the conservation of biodiversity, forests, and marine resources.

However, in spite of these challenges, USAID has had success in working in Papua. IFACS, for example, assisted in development of the provincial spatial plan and has activities in the Timika

mangroves that are under threat from the copper tailing outwash from PT Freeport mining activities. The IUWASH project is working with local communities outside of Jayapura and two district-level *dinas* to ensure clean water supplies. Additionally, the IUWASH project is developing governance guidelines to help resolve environmental conflicts between the two districts and the city of Jayapura, and is assisting with development of climate change guidelines. USAID can potentially build on these experiences to develop Papuan projects that could, for example, focus on capacity building of district and provincial government in areas such as spatial planning, pilot MOHA guidelines, and enforcement of laws such as Law 32/2009.

Another option is to seek out and support civil society and local governments in high conservation value areas that are committed to conservation of its natural resources. The assessment team was impressed, for example, with the Gayo Lues (a new district in Aceh Province) administration's (Bupati, Vice-Bupati, and Bappeda Forestry) commitment to economic development that was in harmony with conservation. Through its current projects and information generated by REDD+ initiatives and environmental programs (e.g., FFI's Community Conservation in Action) the mission can identify like-minded local governments and civil society organizations and develop an initiative that would provide the information, knowledge, and skills for economic development and conservation.

If the objective is to lower forest-based carbon emissions for global climate change mitigation, the geographic focus would be the forest peat lands of Sumatra and Kalimantan, the main areas of deforestation and emissions. Given the global importance of Indonesia's emissions, there are already major initiatives in Sumatra and Kalimantan. Therefore, the mission would have to adopt a programmatic approach of working with the multiple donors' agencies and NGOs that are making substantial investments in conservation of these areas and determine an appropriate niche for USAID investment. Another option would be to focus on the lesser-researched peat lands in Papua that are under growing threat from the Merauke Integrated Food and Energy Estate (an initiative cited under the MP3EI) that is slated to clear 1.2 million hectares of land for palm oil plantations and commercial agriculture.

For marine biodiversity, if the objective is to conserve a high-priority marine area, sites to be considered could be areas designated as a geographic priority by the MMAF (Huffard et al. 2012 see Map 5 in the annex) that are also cited as a priority seascape under the Indonesian Coral Triangle Initiative National Plan of Action (Dirhamsyah 2012), such as Bird's Head of Papua or Tomini Bay in Sulawesi. Activities in these priority areas could align and build on the activities of MPAG and the CTI/Indonesia. Another option would be to continue IMACS activities in districts in Southeast Sulawesi and Nusa Tenggara Barat where there is local engagement and commitment (see Section IV) and to consider extending IMACS to include sites of high conservation value and economic importance, such as in East Nusa Ten, an important area for fisheries as well as the location of a proposed MPA and within a priority seascape of the CTI National Plan of Action.

Higher Priorities:

Governance: underpinning success and failure. The main biodiversity conservation and natural resource management challenges are fundamentally governance issues. It is the ineffective

governance arrangements that fuel environmental degradation, marginalize local communities, and lead to conflicts over resources. Government attention is focused on rapid economic development (e.g., becoming one of the 10 largest global economies in less than a generation) with relatively little concern for the impact of its economic growth on conservation of its biodiversity, forests, and marine resources. This lack of recognition of the value of services provided by healthy ecosystems is reflected in weak enforcement of environmental policies, legislation, and regulations. National policies and regulations are adequate for conservation, but are not enforced. Effective environmental governance is further complicated by decentralization of natural resource management to district governments, which as noted in the report, commonly lack capacity in spatial planning and sustainable resource management as well as having little appreciation of the importance of biodiversity and forests for sustainable development. Running counter to effective local management is the perverse incentive created from generation of revenue by issuing permits and licenses, which is fueling expansion of commercial agriculture at the expense of forest and marine resources.

Two priority recommendations to enhance current and initiate new activities:

- *Strengthen governance and the rule of law.* The mission's current portfolio has numerous projects addressing fundamental governance issues of biodiversity conservation. The recommendation is to build on the mission's current projects and continue to seek opportunities for strengthening enforcement of biodiversity and forest laws and regulations at the national, provincial, and district levels. These opportunities and actions include capacity building in surveillance, bringing to justice those engaged in illegal activities, and promoting compliance (e.g., environmental impact assessments, fines). The mission should identify laws and regulations that have potential for the greatest impact in conserving biodiversity and forests and support their promotion and enforcement. For example, with conversion of forests into commercial agricultural plantations and estates being a major cause of deforestation and loss of habitat for flagship species, the mission can support enforcement of new laws such as Law 32/ 2009 (see text box) to further compliance by plantation companies.

Enforcing the Law

A new Law on Environmental Management, Law 32/2009, became effective in October 2011. It includes a range of criminal sanctions for companies not complying with environmental and social impact assessments. It addresses the fundamental flaw in Indonesia's AMDAL of the absence of sanctions for non-compliance. However, it is at risk of joining a long list of un-enforced, ignored laws in Indonesia's statute book.

— Environment Investigation Agency and Telepak, *2012*

- *Strengthen local governance (district).* A finding of the assessment is the growing importance of district-level government in natural resource management. As noted in this report, decentralization has resulted in districts being responsible for local development planning, licensing concessions, and monitoring, often without the technical capacity, knowledge of policies and regulation, and resources necessary for effective management. A two-pronged strategy to strengthen district capacity is recommended:

  – Facilitate development of guidelines for districts on environmental management, planning, monitoring, and compliance by MOHA, with technical assistance by the ministries of forestry, environment, maritime affairs, and fisheries. These

guidelines can be integrated by the MOHA into its current training for districts, which focuses on financial management and budgeting. If capacity development in environmental management becomes business as usual for all districts, it can play an important role in filling the acknowledged capacity gaps.
  - Pilot adoption of the guidelines targeting districts in key high-biodiversity areas, such as Papua and the marine/coastal areas surrounding West Papua, to build capacity and facilitate conservation and sustainable use of natural resources. Experience gained with IFACS at the district and provincial levels can help guide and better target these approaches.

- *Climate change, conservation, and rights.* Forest-based carbon emissions is the leading source of Indonesia emissions, and current climate change mitigation efforts have primarily focused on halting the conversion of forests to agriculture plantations and estates, especially in the peatland areas (see below). Although the current projected timeline for an international REDD+ agreement (2015) and implementation of international agreements (2020) under the United Nations Framework Convention on Climate Change makes formal REDD+ projects in Indonesia unlikely, international interest and national commitments to lowering Indonesia's forest-based emissions will continue. Although REDD+ projects may not be feasible in the near term, there is increasing discussion of engagement with potential voluntary markets. Although the lowering of forest-based emissions is needed, there is concern that forest carbon projects will focus too narrowly on carbon and not pay adequate attention to the forests, biodiversity, and people.

  A potential role for USAID could be to ensure that REDD+ or voluntary forest carbon programs support conservation of biodiversity and natural forests, not only carbon. Another potential activity would be to support and promote free, prior, and informed consent in not only REDD+, but also in other natural resource-focused initiatives, such as local coastal development and mining, both of which will be sharply expanding in high conservation value areas in Papua and Sumatra. Although REDD+ negotiations are likely to continue well past 2015, current REDD+ initiatives — such as the Forest Investment Program funded by the Climate Investment Funds of the World Bank, with additional funding provided by the Asian Development Bank and International Finance Corporation — can provide an opportunity for promotion and testing of free, prior, and informed consent, which can then be promoted as an approach that should be used in all government forest and natural resource focused initiatives.

Priority Recommendations for Other Program Areas:

Strengthen synergies, collaboration, and integration to ensure that conservation and sustainable management are incorporated through the mission's programs. Illustrative areas of cross-sectoral activities could include:

- *Environmental education and research.* An often-heard concern is about the relatively weak environmental curriculum and relevant research. The mission has developed good links with Indonesian universities through its current marine portfolio and is engaged in activities through other U.S. government interventions in areas such as GIS spatial planning and

climate change research and analysis. In the Partnership for Enhanced Engagement in Research (PEER) project, for example, USAID, in partnership with the USAID/Office of Science and Technology and the National Science Foundation is providing funding for Indonesian scientists to work with foundation-funded researchers. The result has been awards to Indonesian scientists for environmental research in marine biodiversity, the impact of climate change on reefs, peat lands, and wetlands, genetic assessments of commercial fish species, and building of teaching capacity in climate change and natural resource management. The mission could build on these current interventions to enhance environmental studies, strengthening university curriculum and other capacity building opportunities (e.g., short-term professional training). New and continuing activities could, for example, promote the importance of biodiversity and forest resources for healthy ecosystems and sustainable development, further address the gaps in climate change research, build capacity for the valuation of ecosystem services, and integrate environment in development planning, especially for use at the district level. Additional work could be conducted to determine the format (e.g., policy brief, face-to-face meetings, Internet) in which policy-makers prefer to receive research information. For the development of new initiatives in environmental education and research, it is recommended that a needs assignment be conducted that identifies current environmental education and research gaps and considers specific areas that the mission should support.

- *Vulnerable populations.* It is no coincidence that Indonesia's remaining forests overlap with ethnic minorities. There is a real need to support local rights to resources and promote more community-based approaches to natural resource management and ensure that vulnerable populations in biodiversity-rich areas such as Papua have access to the benefits of these resources supported by rights and tools to sustainably use them. With the increasing government focus on Papua as the last frontier with rich resources ripe for exploitation, specific interventions can be implemented at the national level to build support for strengthening local rights and local level to build capacity and understanding of rights, legal procedures, and enforcement.

  Gender is of special concern. As noted in Section III, Indonesia is lagging behind other ASEAN countries in gender equality. The conversion of forests to plantations has a disproportionate impact on women, as changes in the availabiilty of resources commonly found in forests force women to go further distances for food gathered from the forest and fuel, undermining household food security. Women play a crucial role in coastal resource management, and marine degradation adversely affects women's health and livelihood (Dirhamsyah 2012). In Papua, women are especially disadvantaged, having lower literacy rates and years of completed schooling, plus restricted tenure rights. It is recommended that the gender analysis that will be undertaken by the mission includes indicative priority geographic areas with an analysis of resource-dependent activities and roles, access to and control over resources, and suggestons as to how to close the gaps between what women and men need and what development initiatives can deliver.

- *Agriculture and food security.* Agricultural expansion that results in land conversion from forest to field is a major threat to Indonesia's biodiversity and forests. In particular, conversion of natural ecosystems to commercial monoculture plantations of oil palm, rubber,

pulp trees, shrimp farms, and other crops is having a significant impact on Indonesia's biodiversity and forests, particularly in high conservation value landscapes. In addition to threatening forested ecosystems, agriculture also affects freshwater wetlands, mangroves, and coral reefs. Agriculture programs need to be mindful of biodiversity conservation implications during project design to avoid the type of activity that would, for example, promote increased food security by establishing large-scale commercial monocultures in forested landscapes. With awareness of this threat to biodiversity and forests, efforts to promote food security should integrate appropriate biodiversity considerations in policies and decision-making. Activities include promoting biodiversity, environmental and social safeguards, working to ensure that agricultural policies and interventions, especially large-scale commercial crops, do not continue to degrade and destroy natural habitats and areas of high conservation value, supporting enforcement of environment impact assessments (such as required by Law 32/2009) and assessments of the impact of commercial plantations and agricultural estates on biodiversity and forests.

- *Wildlife trafficking.* Indonesia's importance in the wildlife trade and the impact of wildlife trafficking on local biodiversity in Indonesia and its revenue contribution to criminal cartels support a recommendation for further engagement. As noted, development pressures in areas of high biodiversity value, especially those that are home to flagship species such as orangutans and tigers, will hasten habitat degradation and destruction and encourage wildlife trafficking. The USAID Changes for Justice project is already working extensively with the Attorney General's Office General Crimes Division; forest crimes such as wildlife trafficking are under its authority. Recommended activities include the Changes for Justice (C4J) approach to combat loss of forests and biodiversity by promoting full implementation of existing legal processes and increased accountability of local prosecutors' offices and courts by educating local prosecutors and judges on the importance of biodiversity and the impact of its loss on the environment and local indigenous populations; informing local organizations how to effectively file and/or monitor cases; and putting guidelines and processes in place that will result in reduction of deforestation, conversion, and loss of wildlife. Activities such as these can be linked to regional initiatives, such as USAID/Regional Development Mission for Asia (USAID/RDMA) support for the Association of Southeast Asian Nations - Wildlife Enforcement Network (ASEAN WEN) and the recently awarded Wildlife Trafficking Response, Assesment and Priority Setting (W-TRAPS) program.

Strengthening strategic partnerships with key national and regional organizations and initiatives. Illustrative activities could include:

- *ASEAN.* In collaboration with the Regional Development Mission for Asia and other missions in the region, USAID/Indonesia should consider developing a comprehensive strategy to increase collaboration and coordination with ASEAN in areas related to economic growth, biodiversity and natural resources, and climate change, and promote strengthening of environmental standards, compliance, and enforcement that will encourage eco-friendly policies and practices in Indonesia, especially for major industrial crops, such as oil palm, rubber, and cocoa.

- *Coral Triangle Initiative.* Through this key initiative addressing critical biodiversity and climate change issues, the mission should continue to strategically support emerging governance systems and develop broader connections. The activities and lessons learned from USAID IMACS and MPAG have direct relevance to CTI, especially in generation of information, policies, and networks, as well as processes to hinder corruption and promote transparency. The Indonesia National Plan of Actions for the CTI designates priority seascapes and its goals include applying Ecosystem Approach to Fisheries Management (EAFM), improving marine protected area management, and developing and implementing an early action climate adaptation plan for the nearshore marine and coastal environment. The recommendations of this report for marine activities closely align with these priority goals.

- *Blue Economy activities.* There are significant opportunities to expand the current work of IMACS with its support of Indonesia's Blue Economy to forge stronger cross-sector ties in the country. USAID can use these experiences, and those of MPAG and the Coral Triangle Initiative, to foster more dynamic regional links and with neighboring countries through Blue Economy endeavors.

Thematic recommendations. Enhance current and initiate new activities to:

- *Stimulate public-private partnerships for conservation.* The private sector is playing a major role in transforming Indonesia's natural landscape. Private sector investments are converting forestlands to industrial agricultural plantations, extracting petroleum, natural gas and minerals, and expanding infrastructure, trade, and connectivity within Indonesia and across the region. Adoption of sustainability standards by the private sector will have a significant positive impact on conversion of biodiversity and forest resources, USAID/Indonesia should consider strengthening its strategic engagement with the private sector to encourage best practices. This could include voluntary private sector certification initiatives (e.g., for timber, oil palm, fisheries), complying with regulations such as Environmental Management Law 32/2009 (see text box on page 63), supporting and stimulating pro-conservation business ventures (e.g., ecotourism, payments for ecosystem services), and other forms of partnerships for conservation, such as partnerships with terrestrial and marine protected areas.

- *Mainstream climate change across the mission's portfolio*. Climate change is already having a wide-ranging impact, and development programming needs to consider future scenarios to enhance the sustainability of investments. The mission can build on current efforts to assess potential climate impact and integrate these considerations into all sectors, for example, REDD+ and food security, and support a shift in focus in programs such as REDD+ to broader environment and social concerns. The adaptive management activities that the mission has already supported at the district level have brought new levels of understanding to government officials, NGOs, academia, and media representatives who participated and by doing so helped them to better understand the connectedness of the resources they rely on. The mission needs to seek broader avenues for similar activities that can help more communities adapt more widely to climate changes.

- *Strengthen support for marine and fisheries conservation*. Indonesia's people rely on fisheries as their main source of protein. Recognizing the critical connections among biodiversity, climate change adaptation, food security, governance, and health, an integrated approach is needed to conserve fisheries and endangered aquatic species with an eye toward those who migrate across international waters. This approach should build on achievements and lessons learned under IMACS and MPAG, use best practices, and harmonize policies among policy-makers and practitioners in Indonesia and the region. It should continue working to improve licensing, reduce the number of fishing vessels, improve data being collected and monitored and continue to assist the ministry to adhere to international conventions, put observers on boats, and adopt systems that improve profitability. Experiences gained between USAID's Coral Triangle Support Partnership and MPAG's collaboration with the MMAF can help develop new initiatives that strengthen collaboration between MMAF and CTI to share information, promote research, and improve modeling. The geographic marine and fisheries focus (see above) should consider areas of high conservation value such as the priority areas designated by the MMAF and the CTI Plan of Action, which are also important to local fisher folk as well as the continuation of the IMACS approach in current and new sites.

- *Invest in systematic geospatial mapping and monitoring*. Strengthening national, provincial, and district strategic planning and programming by facilitating access, capacity development, and implementation of geospatial mapping would be a significant contribution to enhancing environmental management. Building on U.S. government support for development of the National Mapping Agency's OneMap can help improve the understanding and monitoring of biodiversity threats and national development trends and could be expanded to include geospatial data and indicators related to health (e.g., malaria distribution, emerging pandemic threats), economic growth (e.g., poverty, income), governance, food security, social indicators, environment, climate change, disasters, and other relevant information. Of equal importance is to help ensure that these initiatives result in a trained cadre at provincial and district levels that can effectively use this information on a daily basis.

- *Raise awareness and improve communication about the importance of ecosystem services, biodiversity, and forests to stimulate greater local and national ownership and political will*. Economic growth remains the top priority of the Indonesian government and the private sector, but continued degradation of natural ecosystems threatens to undermine prospects for sustained future growth. Awareness of the importance of healthy ecosystems and biodiversity for economic development needs to be raised and political will mobilized to stimulate action and ownership. The mission can facilitate this by supporting multi-stakeholder engagement in district, provincial, and national planning and monitoring, as it has done in several instances with its IMACS and IFACS programming. The mission can also catalyze and facilitate action and ownership through broad-based strategic partnerships with other efforts and organizations, such as local and international organizations, such as KEHATI and TNC, ASEAN Center for Biodiversity, the ASEAN and South Asia Wildlife Enforcement Networks, community organizations, and journalists. These efforts could lead to a more systematic monitoring of national biodiversity status and trends and more effective communication of these concerns to inform and stimulate proactive responses.

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ANNEX A. U.S. FOREIGN ASSISTANCE ACT, SECTIONS 118 AND 119

Part I, Section 118\73\ - Tropical Forests

(a) Importance of Forests and Tree Cover.--In enacting section 103(b)(3) of this Act the Congress recognized the importance of forests and tree cover to the developing countries. The Congress is particularly concerned about the continuing and accelerating alteration, destruction, and loss of tropical forests in developing countries, which pose a serious threat to development and the environment. Tropical forest destruction and loss--

(1) result in shortages of wood, especially wood for fuel; loss of biologically productive wetlands; siltation of lakes, reservoirs, and irrigation systems; floods; destruction of indigenous peoples; extinction of plant and animal species; reduced capacity for food production; and loss of genetic resources; and

(2) can result in desertification and destabilization of the earth's climate. Properly managed tropical forests provide a sustained flow of resources essential to the economic growth of developing countries, as well as genetic resources of value to developed and developing countries alike.

(b) Priorities.--The concerns expressed in subsection (a) and the recommendations of the United States Interagency Task Force on Tropical Forests shall be given high priority by the President--

(1) in formulating and carrying out programs and policies with respect to developing countries, including those relating to bilateral and multilateral assistance and those relating to private sector activities; and

(2) in seeking opportunities to coordinate public and private development and investment activities which affect forests in developing countries.

(c) Assistance to Developing Countries.--In providing assistance to developing countries, the President shall do the following:

(1) Place a high priority on conservation and sustainable management of tropical forests.

(2) To the fullest extent feasible, engage in dialogues and exchanges of information with recipient countries--

(A) which stress the importance of conserving and sustainably managing forest resources for the long-term economic benefit of those countries, as well as the irreversible losses associated with forest destruction, and

(B) which identify and focus on policies of those countries which directly or indirectly contribute to deforestation.

(3) To the fullest extent feasible, support projects and activities--

(A) which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and

(B) which help developing countries identify and implement alternatives to colonizing forested areas.

(4) To the fullest extent feasible, support training programs, educational efforts, and the establishment or strengthening of institutions which increase the capacity of developing countries to formulate forest policies, engage in relevant land-use planning, and otherwise improve the management of their forests.

(5) To the fullest extent feasible, help end destructive slash-and-burn agriculture by supporting stable and productive farming practices in areas already cleared or degraded and on lands which inevitably will be settled, with special emphasis on demonstrating the feasibility of agroforestry and other techniques which use technologies and methods suited to the local environment and traditional agricultural techniques and feature close consultation with and involvement of local people.

(6) To the fullest extent feasible, help conserve forests which have not yet been degraded, by helping to increase production on lands already cleared or degraded through support of reforestation, fuelwood, and other sustainable forestry projects and practices, making sure that local people are involved at all stages of project design and implementation.

(7) To the fullest extent feasible, support projects and other activities to conserve forested watersheds and rehabilitate those which have been deforested, making sure that local people are involved at all stages of project design and implementation.

(8) To the fullest extent feasible, support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing, including reforestation, soil conservation, and other activities to rehabilitate degraded forest lands.

(9) To the fullest extent feasible, support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation, including research in agroforestry, sustainable management of natural forests, small-scale farms and gardens, small-scale animal husbandry, wider application of adopted traditional practices, and suitable crops and crop combinations.

(10) To the fullest extent feasible, conserve biological diversity in forest areas by--

(A) supporting and cooperating with United States Government agencies, other donors (both bilateral and multilateral), and other appropriate governmental, intergovernmental, and nongovernmental organizations in efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis;

(B) whenever appropriate, making the establishment of protected areas a condition of support for activities involving forest clearance of degradation; and

(C) helping developing countries identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas.

(11) To the fullest extent feasible, engage in efforts to increase the awareness of United States Government agencies and other donors, both bilateral and multilateral, of the immediate and long-term value of tropical forests.

(12) To the fullest extent feasible, utilize the resources and abilities of all relevant United States Government agencies.

(13) Require that any program or project under this chapter significantly affecting tropical forests (including projects involving the planting of exotic plant species)--

(A) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and

(B) take full account of the environmental impact of the proposed activities on biological diversity, as provided for in the environmental procedures of the Agency for International Development.

(14) Deny assistance under this chapter for--

(A) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner which minimizes forest destruction and that the proposed activity will produce positive economic benefits and sustainable forest management systems; and

(B) actions which significantly degrade national parks or similar protected areas which contain tropical forests or introduce exotic plants or animals into such areas.

(15) Deny assistance under this chapter for the following activities unless an environmental assessment indicates that the proposed activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development:

(A) Activities which would result in the conversion of forest lands to the rearing of livestock.

(B) The construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands.

(C) The colonization of forest lands.

(D) The construction of dams or other water control structures which flood relatively undegraded forest lands.

(d) PVOs and Other Nongovernmental Organizations.--Whenever feasible, the President shall accomplish the objectives of this section through projects managed by private and voluntary organizations or international, regional, or national nongovernmental organizations which are active in the region or country where the project is located.

(e) Country Analysis Requirements.--Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of-

(1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests, and

(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

(f) Annual Report.--Each annual report required by section 634(a) of this Act shall include a report on the implementation of this section.

Part I, Section 119\75\ - Endangered Species

(a) The Congress finds the survival of many animal and plant species is endangered by overhunting, by the presence of toxic chemicals in water, air and soil, and by the destruction of habitats. The Congress further finds that the extinction of animal and plant species is an irreparable loss with potentially serious environmental and economic consequences for developing and developed countries alike. Accordingly, the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems, and through the protection of wildlife habitats should be an important objective of the United States development assistance.

\75\ 22 U.S.C. 2151q. Sec. 119, pars. (a) and (b) were added by sec. 702 of the International Environment Protection Act of 1983 (title VII of the Department of State Authorization Act, Fiscal Years 1984 and 1985, Public Law 98-164; 97 Stat. 1045).

(b) \75\ In order to preserve biological diversity, the President is authorized to furnish assistance under this part, notwithstanding section 660,\76\ to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs. Special efforts should be made to establish and maintain wildlife sanctuaries, reserves, and parks; to enact and enforce anti-poaching measures; and to identify, study, and catalog animal and plant species, especially in tropical environments.

\76\ Section 533(d)(4)(A) of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1990 (Public Law 101-167; 103 Stat. 1227), added ``notwithstanding section 660" at this point.

(c) \77\ Funding Level.--For fiscal year 1987, not less than $2,500,000 of the funds available to carry out this part (excluding funds made available to carry out section 104(c)(2), relating to the Child Survival Fund) shall be allocated for assistance pursuant to subsection (b) for activities which were not funded prior to fiscal year 1987. In addition, the Agency for International Development shall, to the fullest extent possible, continue and increase assistance pursuant to subsection (b) for activities for which assistance was provided in fiscal years prior to fiscal year 1987.

\77\ Pars. (c) through (h) were added by sec. 302 of Public Law 99- 529 (100 Stat. 3017).

(d) \77\ Country Analysis Requirements.--Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of-

(1) the actions necessary in that country to conserve biological diversity, and

(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

(e) \77\ Local Involvement.--To the fullest extent possible, projects supported under this section shall include close consultation with and involvement of local people at all stages of design and implementation.

(f) \77\ PVOs and Other Nongovernmental Organizations.-- Whenever feasible, the objectives of this section shall be accomplished through projects managed by appropriate private and voluntary organizations, or international, regional, or national nongovernmental organizations, which are active in the region or country where the project is located.

(g) \77\ Actions by AID.--The Administrator of the Agency for International Development shall-
(1) cooperate with appropriate international organizations, both governmental and nongovernmental;

(2) look to the World Conservation Strategy as an overall guide for actions to conserve biological diversity;

(3) engage in dialogues and exchanges of information with recipient countries which stress the importance of conserving biological diversity for the long-term economic benefit of those countries and which identify and focus on policies of those countries which directly or indirectly contribute to loss of biological diversity;

(4) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity;

(5) whenever possible, enter into long-term agreements in which the recipient country agrees to protect ecosystems or other wildlife habitats recommended for protection by relevant governmental or nongovernmental organizations or as a result of activities undertaken pursuant to paragraph

(6), and the United States agrees to provide, subject to obtaining the necessary appropriations, additional assistance necessary for the establishment and maintenance of such protected areas;

(6) support, as necessary and in cooperation with the appropriate governmental and nongovernmental organizations, efforts to identify and survey ecosystems in recipient countries worthy of protection;

(7) cooperate with and support the relevant efforts of other agencies of the United States Government, including the United States Fish and Wildlife Service, the National Park Service, the Forest Service, and the Peace Corps;

(8) review the Agency's environmental regulations and revise them as necessary to ensure that ongoing and proposed actions by the Agency do not inadvertently endanger wildlife species or their critical habitats, harm protected areas, or have other adverse impacts on biological diversity (and shall report to the Congress within a year after the date of enactment of this paragraph on the actions taken pursuant to this paragraph);

(9) ensure that environmental profiles sponsored by the Agency include information needed for conservation of biological diversity; and

(10) deny any direct or indirect assistance under this chapter for actions which significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas.

(h) \77\ Annual Reports.--Each annual report required by section 634(a) of this Act shall include, in a separate volume, a report on the implementation of this section.

ANNEX B. STATEMENT OF WORK

Purpose

The Contractor shall conduct and complete a country-wide assessment of biodiversity and tropical forestry conservation needs and related issues for the purpose of complying with Sections 118 and 119 of the Foreign Assistance Act of 1961, as amended, and agency guidance on country strategy development under ADS 201.3.2/3/4, Environmental Procedures. Based on this needs assessment, the contractor shall provide an analysis of proposed actions under USAID's strategy to identify how USAID/Indonesia programming contribute/affect the conservation needs of Indonesia with exception for international disaster assistance.

Background

Indonesia has some of the most diverse forest and marine ecosystems in the world. Pressures on forest lands, fresh water, and marine environs have resulted in significant biodiversity losses. Several species and their habitats are under serious threat of extinction. Illegal and unsustainable logging, poaching, illegal mining, forest fires, and forest land conversion for agriculture largely drive the severe forest degradation. Illegal and unregulated fishing and degradation of coral reefs and sea grass beds deplete valuable marine resources. These biodiversity losses also represent significant economic losses to Indonesia's economy, which is largely dependent upon natural resources.

In 2008, USAID developed a five-year strategic plan for its assistance program to Indonesia. As part of that process, an FAA 118 and 119 report titled, "Conservation of Tropical Forests and Biological Diversity," was submitted and approved by the agency. Also as a follow up to this FAA 118 and 119 reports, a subsequent report recommending strategic opportunities was prepared by an independent contractor. USAID's current programs are partially a result of these reports' recommendations.

Scope of Work

The Contractor will build on the previous work and include changes and provide the updates necessary since prior reports. Information will be gathered from a review of relevant reports as well as interviews and field work conducted in Indonesia.

The Contractor shall perform the following activities:

1. Pre-travel information meetings and information gathering. Prior to traveling to the field, the contractor is expected to:

    1. Hold a meeting with the USAID Asia and Middle East Bureau Technical Services Office Director, John Wilson, the Bureau Supervisory Environmental Program Specialist, Mary Melnyk, and others from the Bureaus for Asia and EGAT familiar with environmental analysis for USAID strategy preparation and with Indonesia. The purpose of meeting is to brief these USAID staff on the contracted

activities and obtain their input and guidance concerning strategic policies and technical approaches for the assessment of biodiversity and tropical forestry conservation relevant to Indonesia. The meeting will also identify relevant sources of background information, as well as key persons to consult concerning the assignment.

2. Gather and become familiar with existing background information on Indonesia, such as Indonesian natural resources, geographical, ecological and biological characteristics, current status of environment and biodiversity, key stakeholders and donors in environment and biodiversity, legislation and policies related to the environment and biodiversity, and other relevant information required for the country assessment.

3. Meet or speak with key stakeholders or managers at the World Bank, ADB, AUSAID, JICA, DIFD, GiZ, UNDP, Norway, CIFOR, U.S.-based NGOs engaged in biodiversity and tropical forestry issues in Indonesia, including Conservation International, The Nature Conservancy, World Wildlife Fund, and Wildlife Conservation Society, Mercy Corps, KEHATI. Other organizations involved in biodiversity conservation in Indonesia or relevant regional efforts should also be contacted.

2. Field a team to travel to Indonesia to conduct an overview and detailed analysis of Indonesia's tropical forestry and marine resources, and biodiversity. Upon arriving in Indonesia, the team will:

1. Meet with USAID/Indonesia to get a solid understanding of mission program goals and objectives under its current strategy; expectations in performing the contract and specific interests of USAID/Indonesia, including advice and protocol on approaching USAID partners and host country organizations with respect to this assignment. The Contractors' team shall be aware of sensitivities related to an assessment exercise (i.e., the potential for raising expectations, and the need to be clear about the purpose of the assessment) and will respect mission guidance. The Contractors' team will discuss organizations to be contacted and any planned site visits with the mission and coordination of these visits. As required, USAID/Indonesia will facilitate meetings with other mission Technical teams.

2. Hold meetings to gather information from donor organizations, NGOs, relevant government agencies, and other organizations that are knowledgeable of biodiversity and tropical forestry conservation or are implementing noteworthy projects locally.

3. Conduct not less than four site visits to supplement understanding of USAID's program, or of tropical forestry and biodiversity issues that arise in interviews and literature or would confirm information in previous assessments. The site(s) for any field visit will be determined by the Contractor's team during the assessment in consultation with USAID/Indonesia.

4. Assess and summarize the needs for biodiversity and tropical forestry conservation in Indonesia based on key threats and the Contractor's analysis of country, donor and NGO responses to meet these needs. Prepare a report on the status of biodiversity, tropical forestry, and conservation efforts in Indonesia. Report potential implications for USAID/Indonesia or other donor programming and environmental monitoring which could define the actions necessary for conservation.

The report shall include:

1. The current status of biodiversity, tropical forests, marine ecosystems, and examination of biodiversity, tropical forests, marine ecosystems, and key watersheds and river basins with particular attention to impacts of key economic policies and major infrastructure projects on biodiversity in Indonesia based on the most current information available.

2. Major ecosystem types, highlighting important, unique aspects of the country's biodiversity, including important endemic species and their habitats.

3. Descriptions of natural areas of critical importance to tropical forest and biodiversity conservation, such as forests, marine ecosystems, major inland lakes and river systems, wetlands, and coastal areas necessary for species reproduction, feeding or migration, if relevant. Particular attention is to be given to critical environmental services and non-commercial services they provide (watershed protection, erosion control, soil, fuel wood, water conservation, disaster mitigation, and amenity and recreation).

4. An overview table and map of the status and management of protected areas in Indonesia including: an inventory of all declared and proposed areas (national parks, wildlife reserves and refuges, forest reserves, marine reserves, sanctuaries, hunting preserves and other protected areas) including marine and coastal areas.

5. Descriptions of plant and animal species that are endangered or threatened with extinction. Endangered species of particular social, economic or environmental importance are to be highlighted and described, as should their habitats. Technical information resources such as the International Union for Conservation of Nature (IUCN) red list and their website are to be referenced for future mission access as required. This section should not emphasize species counts, but look at the relation of endangered species and important habitat conservation areas and issues, and evaluate the pressure on those areas, including vulnerability to predicted changes in climate, and current efforts to mitigate pressures, including the participation and compliance with the Convention on International Trade in Endangered Species (CITIES) and other international efforts.

6. Recent, current, and potential primary threats to biodiversity, whether they are ecological (i.e., fire, pests), related to human use (i.e., agriculture, contamination), institutional (i.e., failed policy) or trans-boundary issues, as appropriate. These areas are to emerge from a general assessment of national policies and strategies and their effectiveness, issues related to institutional capacity, trade, private sector growth, participation in international treaties, and the role of civil society.

7. Conservation efforts, their scope and effectiveness. This section is to include recent, current, and planned activities by donor organizations that support biodiversity and tropical forestry conservation, identification of multilateral organizations, NGOs, universities, and other local organizations involved in conservation, and general description of responsible government agencies. A general assessment of the effectiveness of these policies, institutions, and activities to achieve biodiversity conservation is to be included. Priority conservation needs that lack donors or local support is to be highlighted.

8. Analysis of the current Indonesian legislation related to tropical forestry and biodiversity. This section is to include identification of laws related to protection and management of tropical forestry, biological resources and endangered species. It is to point out any differences in laws that require further harmonization. This section is to also review international treaties signed and ratified, as well as those that Indonesia needs to sign in order to conserve and manage its biological resources more effectively.

9. An overview of the major biodiversity and tropical forest related activities of the commercial private sector to identify ways to better foster private sector alliances. Of interest are the norms and standards followed by those commercial entities most engaged in management and use of Indonesia's tropical forests and tracts near protected areas, including tourism developers, palm oil plantations, and timber producers. Consideration of policies promoted by key relevant governmental ministries should be included.

10. The report will make recommendations on where USAID comparative advantages and capabilities are likely to have the greatest impact to meet the needs for biodiversity and tropical forestry conservation in Indonesia. This could include potential opportunities for USAID to contribute to biodiversity and tropical forestry conservation, consistent with mission program goals and objectives, through development objectives other than environment. These issues and recommendations will be prioritized to identify those requiring the most immediate attention.

11. The report is to contain recommendations for both marine and terrestrial programs that should feed into the upcoming strategic planning, Country Development Cooperation Strategy process. This expanded section of the

report will incorporate programmatic opportunities identified during the assessment, targeting issues and niche opportunities not currently being addressed. The rationale for their inclusion as well as specific, targeted outcomes are to be elaborated in the report. These recommendations for new programming prospects should also feed into the success of current and future programs. However, if these recommendations are completely new and different from currently considered sectors or areas, then explanation should be provided on why these are more important to other areas and the benefit of these new targets of opportunities.

12. The recommendations are to address the role of gender in planning and implementation of U.S. government programs related to biodiversity and forestry and how to incorporate USAID Forward pillars of innovation, science and technology, and capacity building of the local NGOs in developing future programs.

13. The report will discuss potential impact – both positive and negative – of all USAID/Indonesia sector programs. Therefore, all USAID Programs, mission wide, impact needs to be assessed.

If any perceived areas of concern related to USAID's impact on biodiversity and/or tropical forests arise during this assessment, the Contractor shall provide its views and suggestions directly to the TOCOR and include it in the final report.

Relationship and Responsibilities

The Contractor shall collaborate with the USAID/Indonesia Task Order Contracting Officer Representative (TOCOR). The Contractor will be responsible for identifying and obtaining the majority of the reference materials needed for this study with only minimal assistance on the part of USAID/Indonesia.

Deliverables

There shall be four deliverables under this contract:

1. Work Plan and Schedule: The Contractor submit the TOCOR with a work plan and schedule within seven working days of contract award. The work plan and schedule shall contain a list of those individuals and agencies that are to be interviewed, and a list of reports, evaluations, etc., to be reviewed and the associated timeline for execution of the contract work.

2. In-Country mission Exit Briefings: Prior to the Contactor's team departure, the Contractor's team shall meet with USAID/Indonesia to provide a brief of the report findings. The exit briefing shall be accompanied by an initial written summary of key findings and recommendations that is no longer than four (4) pages in both English and Indonesian.

3. Draft Report: The Contractor shall submit a draft report to the TOCOR no later than ten working days after departing Indonesia. The report shall be in English and Indonesian, will not exceed thirty pages, excluding suitable annexes and pertinent figures (maps, institutional charts, tables) and references. Among the report's appendices are a briefly annotated bibliography of the most important current reference materials and a contact list for each of the organizations discussed in the report.

4. Final Report: The final report is due no later than 10 working days after receiving USAID/Indonesia's comments on the first draft report.

The Contractor will furnish to the TOCOR both electronic file and hard copy versions of the draft and final report deliverables, including one photocopy-ready version of the final report.

Schedule and Logistics

In its proposal, the Contractor shall provide an illustrative work schedule which will be refined as part of the first contract deliverable. All deliverables are expected to be completed within 75 days of the award of the contract.

The Contractor is responsible for all administrative and support arrangements. The Contractor's Team Leader will coordinate logistical arrangements with the TOCOR, and will work with the TOCOR to schedule meetings and site visits acceptable to the mission. The schedule will include an arrival and departure briefing with the Environment Office and other mission staff to discuss the work plan, schedule, initial findings, and recommendations.

ANNEX C. EXPERTS CONSULTED

Name	Title	Organization	Date
Washington, D.C.			
Fred Bagley	Program Officer/ Wildlife Biologist	USFWS	September 12, 2012
Meenakshi Nagendran	Program Officer/ Wildlife Biologist	USFWS – Asian Elephant Conservation Fund	September 12, 2012
Richard Volk	Water Advisor	USAID/E3	September 12, 2012
Crispen Wilson	Deputy Director, E&R	Rainforest Alliance	September 12, 2012
Barbara Best	Coastal Marine Specialist	USAID/E3	September 13, 2012
Craig Kirkpatrick	Managing Director	WWFUS	September 13, 2012
Nirmal Bhagabati	Sr. Program Officer, Ecosystem Services	WWFUS	September 13, 2012
Christine Dragisic	REDD+ Focal Point	U.S. State Department	September 14, 2012
John Verdieck	Foreign Affairs Officer	U.S. State Department	September 14, 2012
Ellen Shaw	Foreign Policy Officer	U.S. State Department	September 14, 2012
Jakarta, Indonesia			
H. Olivia Ahn	Natural Resources Officer	USAID Indonesia	September 18, 2012
Hannah Fairbank	Biodiversity and Forestry Advisor	USAID/E3	September 18, 2012
Richard Volk	Water and Marine Management Advisor	USAID/E3	September 18, 2012
John Hansen	Director, Environment Office	USAID Indonesia	September 19, 2012
Aurelia Micko	Deputy, Environment Office	USAID Indonesia	September 19, 2012
Dave Heesen	Senior Environmental Advisor	USAID Indonesia	September 19, 2012
Matthew Fisher-Gormley	Program Officer, Environment Office	USAID Indonesia	September 19, 2012
James Whittaker	Chief Economist	USAID Indonesia	September 19, 2012
John Thurow	Agriculture Economist	USAID Indonesia	September 19, 2012
Nick Thomas	GIS Specialist	TetraTech ARD	September 19, 2012
Patrick Gault	GIS Specialist	USAID, Geo Center, S & T Office	September 19, 2012
David Hatch	Deputy Director, Program Office	USAID Indonesia	September 20, 2012
Tony Djogo	Program Management Specialist, Environment Office	USAID Indonesia	September 20, 2012
Nassat Idriss	Program Management Specialist, Environment Office	USAID Indonesia	September 20, 2012
Kendra Chittenden	Senior Diseases and Science Technology Advisor	USAID Indonesia	September 20, 2012
Celly	Marine and Coastal Management Specialist	USAID Indonesia	September 20, 2012
Derek Brown	Acting Director	USAID Indonesia	September 20, 2012
Bill Rush	Senior Forest Advisor to Indonesia	USFS	September 24, 2012
Rini Sulaiman	Consultant	USFS	September 24, 2012
Reed Merrill	Chief of Party	USAID IFACS	September 25, 2012
Darrell Kitchener	Biodiversity & Climate Change Advisor	USAID IFACS	September 25, 2012
Lex Hovani	Forest Carbon Advisor	The Nature Conservancy	September 26, 2012
Andree Putri		The Nature Conservancy	September 26, 2012

Name	Title	Organization	Date
Barano Sulistyawan	Program Manager	WWF Indonesia	September 26, 2012
Dr. Samedi	Program Director TFCA	KEHATI	September 28, 2012
Ali Sofiwan	Communications and Outreach Specialist	KEHATI	September 28, 2012
Richard Volk	Water and Marine Advisor	USAID/E3	September 29, 2012
Trgeany Linggoatmodjo	Program Specialist, Environment Office	USAID Indonesia	October 1, 2012
Sutedja	Ex- Forest Protection & Nature Conservation, Papua	GiZ ForClime	October 8, 2012
Richard Mounsey	Chief of Party	USAID IMACS	October 9, 2012
Cherryta Yunia	Deputy Director	Forest Management & Conservation Unit, Ministry of Forestry	October 18, 2012
Timothy Brown	Senior Natural Resources Management Specialist	World Bank	October 19, 2012
Andy Roby	FLEGT VPA Facilitator	EU and DFID Consultant	October 19, 2012
Budimann	Director	DG Capture Fisheries, Ministry of Marine Affairs and Fisheries	October 19, 2012
David Heesen	Senior Environmental Advisor	USAID Indonesia	October 26, 2012
Blair Palmer	Director, Environmental Governance	Asia Foundation	November 2, 2012
David Anderson	Chief of Party	USAID Changes for Justice	November 2, 2012
Kupang, East Nusa Tenggara, Indonesia			
Alex Tanody	Project Leader	USAID MPAG	October 2, 2012
Mirza	Conservation Manager	USAID MPAG	October 2, 2012
Tinus	Head	Environment Office, NTT	October 3, 2012
Midonth	Conservation Department	Environment Office, NTT	October 3, 2012
Wilhelmus	Director	IE HARI	October 3, 2012
YansKoliham	Director	YPPL	October 3, 2012
Ina	Staff	YPPL	October 3, 2012
Jothan Ninef	Coordinator and Fisheries Dept Faculty	P4KKP (Provincial Ad hoc advisory committee for the Savu Sea MPA); University of Nusa Cendana	October 3, 2012
Sulastri	Marine Culture & Small Islands Dept.	DKP (Marine & Fisheries Agency) - Kupang	October 3, 2012
Kadir	Head of Data, Planning, and Evaluation	DKP (Marine & Fisheries Agency) - Kupang	October 3, 2012
Izaak	Conservation and Rehabilitation	DKP (Marine & Fisheries Agency) - Kupang	October 3, 2012
Thomas	Facilities and Human Resources	BAPPEDA (Provincial Planning Agency) - Kupang	October 4, 2012
Sonny	Natural Resources Section	BAPPEDA (Provincial Planning Agency) - Kupang	October 4, 2012
Gaspar	Marine Resources Section	BAPPEDA (Provincial Planning Agency) - Kupang	October 4, 2012
Maxi	Head	HNSI, Kota Kupang	October 4, 2012
Jamal	Advocate Section	HNSI, Kota Kupang	October 4, 2012
Ronal	Member	HNSI, Kota Kupang	October 4, 2012
Jayapura & Timika, Papua, Indonesia			

Name	Title	Organization	Date
Sirjon Mainggolan	Deputy	Papua Province Environment Office	October 10, 2012
Martin		Papua Province Environment Office	October 10, 2012
Noach Wamebu	Director	Association for Papua Indigenous Peoples' Study and Empowerment	October 11, 2012
Lyndon Pangkall	Ecoforestry Program Coordinator	Association for Papua Indigenous Peoples' Study and Empowerment	October 11, 2012
Dr. Alex Rumaseb	Head	BAPPEDA (Provincial Planning Agency) -Papua	October 11, 2012
Joe Valentino	Papua Coordinator	USAID IUWASH	
Singhi	Governance Specialist	USAID IUWASH	
Nicolas Kaufman	Health Officer	USAID Indonesia	October 12, 2012
Benja	Director	WWF Papua	October 12, 2012
Deky	Regional Director, Timika	USAID IFACS	October 13, 2012
Kendari, Sulawesi Tenggara, Indonesia			
Diana Chaidir	Field Coordinator	USAID IMACS	October 15, 2012
Agus Salim Safrallah	Head of Unit	DKP (Marine & Fisheries Agency) -Kendari	October 15, 2012
Irham Pinjais	Director	Yayasan YASHINTA	October 15, 2012
Jumkan	Program Manager	Yayasan YASHINTA	October 15, 2012
Askabul Kijo	Head	DKP (Marine & Fisheries Agency) - Sulawesi Tennggara	October 15, 2012
Risnawati		DKP (Marine & Fisheries Agency) - Sulawesi Tennggara	October 15, 2012
J. Robert	Head, Social Unit	BAPPEDA (Provincial Planning Agency) – Sulawesi Tenggara	October 16, 2012
Amram Alie	Head	BLHD (Regional Environment Agency) - Sulawesi Tenggara	October 16, 2012
Halili	Lecturer and Mitra Bahari Member	Haluoleo Unviersity	October 16, 2012
Imram	Private entrepreneur	Private Sector Fisherman	October 16, 2012
Kutacane, Aceh Tenggara And Blangkejeren, Gayo Lues, Indonesia			
Azarudin	Head, Forestry Unit	Aceh Tenggara	October 22, 2012
Kurnia	Head, Conservation Section; Cahir, Forum Leuser Agara	Aceh Tenggara	October 22, 2012
Ishak Bukhari	Head, Plantation Section	Aceh Tenggara	October 22, 2012
Sunarwadi	Co-chair	Forum Leuser Agara	October 22, 2012
Indra Wahyudi	Member	Forum Leuser Agara	October 22, 2012
Buana Dharmansyah	Head of Division	Gunung Leuser National Park	October 22, 2012
Ali	Program Manager	Orangutan Information Center-Ketambe	October 22, 2012
Dina Kartika Sari	CARE Coordinator	Orangutan Information Center-Ketambe	October 22, 2012
Drajo	Staff member	Orangutan Information Center-Ketmbe	October 22, 2012
Tisna Nando	Community Development Advisor	USAID IFACS	October 22, 2012
Yusdah Hema	Technical Specialist	Swiss Contact, Gayo Lues	October 23, 2012
Kitri	Program Manager	Swiss Contact, Gayo Lues	October 23, 2012

Name	Title	Organization	Date
Adam	Vice-Bupati	Gayo Lues Administration	October 23, 2012
Hasyim	Bupati	Gayo Lues Administration	October 23, 2012
Ferri Siswanto	Chairman	Gayo Lues – Multi-Stakeholder Form	October 23, 2012
Alimin	Head Forest Unit	Gayo Lues Administration	October 23, 2012
Abu Lubris	Project Leader, TFCA	Leuser International Foundation-Medan	October 23, 2012
Nijar Tarigan	Coordinator, Border Maintenance Forest Rehabilitation	Leuser International Foundation-Medan	October 23, 2012

ANNEX D. BIODIVERSITY DATA

Table 1. Forest Cover Status by Island and Forest Classification (2011)

Extent of Forest Cover Inside and Outside of Officially Designated Forest Area Based on the Interpretation of Landsat 7 ETM+ Satellite Image (x 1000 hectares)							
Island/Presence or absence of Forest Cover	National Forest Estate Area					Area Outside National Forest Estate	Total
	Designated Permanent Forest Status				Conversion		
	Conservation	Protection	Limited Production	Production			
Sumatra							
Forest	3,867	3,646	2,640	2,712	811	1,167	14,843
-Primary Forest	2,253	1,257	843	311	38	55	4,757
-Secondary Forest	1,601	2,339	1,624	1,850	683	1,006	9,103
-Planted Forest	13	51	173	552	89	106	984
Non Forest	1,040	2,317	1,274	4,682	4,630	17,754	31,697
No Data	1	7	2	8	3	29	49
Total	4,908	5,971	3,915	7,402	5,444	18,951	46,590
Bangka Belitung							
Forest	11	71	-	115	-	71	268
-Primary Forest	2	17	-	15	-	6	40
-Secondary Forest	9	54	-	99	-	65	227
-Planted Forest	-	-	-	-	-	-	-
Non Forest	24	85	-	352	-	936	1,397
No Data	-	-	-	-	-	-	-
Total	35	157	-	466	-	1,007	1,665
Riau Archipelago							
Forest	0	25	136	-	146	-	307
-Primary Forest	-	0	35	-	15	-	50
-Secondary Forest	0	25	101	-	129	-	254
-Planted Forest	-	-	1	-	2	-	3
Non Forest	3	16	82	-	373	-	472
No Data	-	1	1	-	3	-	5
Total	3	41	219	-	522	-	783
Java							
Forest	415	517	310	994	-	1,782	4,019
-Primary Forest	138	87	36	21	-	25	307
-Secondary Forest	184	184	64	102	-	583	1,117
-Planted Forest	93	246	210	871	-	1,174	2,595
Non Forest	78	189	114	424	-	8,508	9,311
No Data	0	-	-	-	-	-	0
Total	493	706	424	1,418	-	10,289	13,329
Bali							
Forest	13	71	3	0	-	17	103
-Primary Forest	3	39	1	0	-	1	44
-Secondary Forest	9	31	1	0	-	16	57
-Planted Forest	1	0	0	0	-	0	2
Non Forest	10	25	4	2	-	424	464
No Data	-	-	-	-	-	-	-

Extent of Forest Cover Inside and Outside of Officially Designated Forest Area Based on the Interpretation of Landsat 7 ETM+ Satellite Image (x 1000 hectares)							
Island/Presence or absence of Forest Cover	National Forest Estate Area					Area Outside National Forest Estate	Total
	Designated Permanent Forest Status				Conversion		
	Conservation	Protection	Limited Production	Production			
Total	23	96	7	2	-	440	568
Nusa Tenggara							
Forest	125	737	360	290	16	1,064	2,591
-Primary Forest	66	317	162	44	1	76	666
-Secondary Forest	58	419	199	245	15	987	1,922
-Planted Forest	1	0	0	1	0	2	3
Non Forest	140	425	124	290	85	2,981	4,045
No Data	0	0	0	0	0	0	0
Total	264	1,162	484	579	102	4,046	6,636
Borneo							
Forest	3,638	5,351	9,402	6,783	1,289	2,696	29,158
-Primary Forest	2,529	3,241	3,318	528	15	265	9,895
-Secondary Forest	1,064	2,093	6,071	5,738	1,236	2,243	18,446
-Planted Forest	45	18	13	517	39	188	818
Non Forest	1,038	1,034	1,184	7,435	3,679	9,551	23,921
No Data	-	-	-	-	-	-	-
Total	4,676	6,385	10,586	14,218	4,968	12,246	53,079
Sulawesi							
Forest	1,155	3,889	2,798	832	369	1,075	10,117
-Primary Forest	467	1,896	1,115	197	71	168	3,915
-Secondary Forest	687	1,990	1,676	631	298	903	6,185
-Planted Forest	1	2	7	3	0	4	17
Non Forest	225	958	424	648	295	5,587	8,137
No Data	-	-	-	-	-	-	-
Total	1,379	4,847	3,221	1,479	664	6,663	18,254
Maluku							
Forest	283	1,511	1,479	679	1,179	188	5,318
-Primary Forest	100	418	209	101	210	22	1,059
-Secondary Forest	184	1,092	1,265	556	964	167	4,227
-Planted Forest	-	0	5	22	5	-	32
Non Forest	41	299	175	374	1,126	445	2,461
No Data	-	-	-	-	-	-	-
Total	325	1,810	1,654	1,053	2,305	633	7,779
Papua							
Forest	6,430	9,085	1,989	8,342	6,948	643	33,437
-Primary Forest	5,444	8,055	1,491	6,002	4,492	318	25,802
-Secondary Forest	986	1,030	498	2340	2,455	325	7,634
-Planted Forest	-	-	-	0	2	0	2
Non Forest	1,589	1,522	63	2,239	2,308	415	8,136
No Data	7	12	2	4	6	1	33
Total	8,026	10,619	2,054	10,585	9,262	1,060	41,606

Extent of Forest Cover Inside and Outside of Officially Designated Forest Area Based on the Interpretation of Landsat 7 ETM+ Satellite Image (x 1000 hectares)							
Island/Presence or absence of Forest Cover	National Forest Estate Area					Area Outside National Forest Estate	Total
	Designated Permanent Forest Status				Conversion		
	Conservation	Protection	Limited Production	Production			
Indonesia							
Forest	15,926	24,806	18,979	20,631	10,612	8,632	99,587
-Primary Forest	11,001	15,310	7,174	7,205	4,827	928	46,444
-Secondary Forest	4,773	9,179	11,398	11,461	5,651	6,230	48,690
-Planted Forest	153	318	407	1,966	135	1,474	4,453
Non Forest	4,160	6,770	3,361	16,093	12,124	45,665	88,172
No Data	7	19	4	12	9	31	82
Total	**20,094**	**31,595**	**22,344**	**36,736**	**22,745**	**54,327**	**187,84**

Source: 2011 Forestry Statistics of Indonesia, from the Ministry of Forestry, http://www.dephut.go.id , accessed November 4, 2012.

Table 2. Deforestation Rate Inside and Outside Forest Area

Island/Presence or Absence of Forest Cover	National Forest Estate Area					Area Outside National Forest Estate	Total
	Designated Permanent Forest Status				Conversion		
	Conservation	Protection	Limited Production	Production			
Sumatra							
Forest							
-Primary Forest	959	813	819	3,454	48	769	6,862
-Secondary Forest	13,905	39,162	67,721	99,871	51,639	68,629	340,927
-Planted Forest	197	2,301	20,383	22,236	7,263	4,757	57,137
Total	15,061	42,277	88,922	125,561	58,951	74,154	404,926
Bangka Belitung							
Forest							
-Primary Forest	0	38	0	71	0	0	109
-Secondary Forest	336	810	0	2,880	0	5,936	9,962
-Planted Forest	0	0	0	0	0	0	0
Total	336	847	0	2,951	0	5,936	10,070
Riau Archipelago							
Forest							
-Primary Forest	0	0	20	0	32	0	53
-Secondary Forest	0	222	435	0	3,345	0	4,001
-Planted Forest	0	0	0	0	0	0	0
Total	0	222	455	0	3,377	0	4,054
Java							
Forest							
-Primary Forest	0	4	0	0	0	0	4
-Secondary Forest	4	76	22	369	0	495	966
-Planted Forest	387	556	3,418	4,899	0	7,435	16,695
Total	392	635	3,440	5,268	0	7,930	17,665
Bali							
Forest							
-Primary Forest	0	0	0	0	0	0	0
-Secondary Forest	4	245	0	0	0	332	580
-Planted Forest	122	0	45	0	0	20	187
Total	126	245	45	0	0	352	767
Nusa Tenggara							
Forest							
-Primary Forest	959	813	819	3,454	48	769	6,862
-Secondary Forest	13,905	39,162	67,721	99,871	51,639	68,629	340,927
-Planted Forest	197	2,301	20,383	22,236	7,263	4,757	57,137
Total	15,061	42,277	88,922	125,561	58,951	74,154	404,926
Borneo							
Forest							
-Primary Forest	250	592	250	2,382	0	44	3,518
-Secondary Forest	2,795	9,099	27,685	109,865	56,850	116,860	323,155
-Planted Forest	21	296	24	3,731	134	1,243	5,449

Total	3,067	9,987	27,960	115,979	56,984	118,147	332,122
Sulawesi							
Forest							
-Primary Forest	11	47	53	30	0	71	213
-Secondary Forest	324	2,435	4,291	1,960	316	10,433	19,757
-Planted Forest	0	0	0	86	0	12	99
Total	335	2,482	4,344	2,076	316	10,516	20,069
Maluku							
Forest							
-Primary Forest	0	0	0	0	0	0	0
-Secondary Forest	22	501	2,868	253	2,156	586	6,385
-Planted Forest	0	0	0	0	0	0	0
Total	22	501	2,868	253	2,156	586	6,385
Papua							
Forest							
-Primary Forest	1,023	2,994	62	2,449	1,446	1,711	9,685
-Secondary Forest	4,945	7,044	1,333	1,705	8,529	1,868	25,425
-Planted Forest	0	0	0	0	0	0	0
Total	5,969	10,038	1,395	4,154	9,975	3,579	35,110
Indonesia							
Forest							
-Primary Forest	2,254	4,500	1,213	8,415	1,526	2,599	20,506
-Secondary Forest	22,356	59,677	104,426	217,077	122,835	205,685	732,055
-Planted Forest	727	3,153	23,870	30,952	7,397	13,467	79,566
TOTAL	25,336	67,330	129,508	256,444	131,758	221,751	832,127

Source: Forestry Statistics of Indonesia 2011

Table 3. Deforestation, Island-by-Island and by Fire and Various Products

Island	Fire (Ha)	Plywood & LVL (m3)	Venner (m3)	Sawn Timber (m3)	Chipwood (m3)	Pulp (Ton)	Rattan (Ton)	Pine Sap (Ton)	Resin (Ton)	Aloes (kg)	Eucalyptus Oil (Liter)	Bamboo	Sago	Rubber Latex
Sumatra	284	383,728	74,078	165,051	219,131	6,163,174	13,890	103,535	4,839	30	0	422,800	100,000	5,720
Bangka Belitung	0	0	0	0	0	0	0	0	0	300	0	0	0	0
Riau Archipelago	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Java	2,038	1,185,849	621,617	499,470	5,381	0	0	0	1,700	0	16,000	0	0	0
Bali	0	0	0	15,029	0	0	0	0	0	0	0	0	0	0
Nusa Tenggara	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Borneo	170	1,345,181	42,961	123,640	1,410,712	15,185	460	0	0	634	0	0	0	1,446
Sulawesi	117	179,867	32,466	2,424	0	0	67,340	14,790	0	0	0	560,000	0	0
Maluku	0	1,514	14,152	0	0	0	0	0	0	0	4,500	0	0	0
Papua	0	206,703	30,818	129,144	153,212	0	0	0	0	0	0	0	2,500,000	0
Indonesia	**2,612**	**3,302,843**	**816,095**	**934,757**	**1,788,435**	**6,178,359**	**81,690**	**118,325**	**6,539**	**964**	**20,500**	**982,800**	**2,600,000**	**7,166**

Source: Forestry Statistics of Indonesia 2011

Table 4. Comparative Analysis of Decreasing Trends in Forest Cover (Deforestation)

Total (net) Forest Cover in Indonesia (1,000 ha)

	1990	2000	2005	2010
Forest Cover	118,545	99,409	97,857	94,432
Change Rate		-1,914	-130	-685
Change Rate (%)		-1.75	-0.31	-0.71

Trends in Forest Cover (excluding Planted Forests) (1,000 ha)

	1990	2000	2005	2010
Forest Cover	118,545	95,737	94,158	90,883
Change Rate		-2,281	-2,281	-485
Change Rate (%)		-1.9	-1.92	-0.51

Trends in Primary or Old Growth Forest Cover (1,000 ha)

	1990	2000	2005	2010
Forest Cover		49,270	47,750	47,236
Change Rate			-304	-103
Change Rate (%)			-0.62	-0.22

Trends in Planted Forest Cover (1,000 ha)

	1990	2000	2005	2010
Forest Cover		3,672	3,699	3,549
Change Rate			5	-30
Change Rate (%)			0.15	-0.82

Source: rainforests.mongabay.com, accessed November 7, 2012.

Table 5. Status of Mangrove, Island-by-Island from 1982-2003 (Ha)

Island	1982	1987	1993	2002	2003
Sumatra	695,943	773,700	862,250	435,000	923,500
Bangka Belitung	0*	0*	0*	63,000	0
Java	49,935	7,200	33,800	40,000	170,500
Bali	1,950	500	800	3,000	1,000
Nusa Tenggara	5,508	21,500	10,780	32,000	124,000
Borneo	383,450	920,000	1,139,460	641,000	1,092,000
Sulawesi	99,833	90,000	250,660	162,000	269,300
Maluku	100,000	46,500	148,710	170,000	197,500
Papua	2,943,000	1,382,000	1,326,990	1,622,000	1,500,000
Total	**4,279,619**	**3,241,400**	**3,773,450**	**3,168,000**	**4,277,800**

*At the time of the study, Bangka and Belitung were seen as being a part of a difference province, and no data were recorded.

Sources: *Dephut, 2012*, www.dephut.go.id, accessed November 5, 2012.
River Basin Management Board - BPDAS, Director General RLPS, MOF in 2006 in SoER Indonesia 2007
Fourth National Report The Convention on Biological Biodiversity, Ministry of Environment 2009

Table 6. Mangrove Zone Conditions of Particular Islands in 2006

Province	Mangrove Zone Condition			Total
	Good (Ha)	Moderate(Ha)	Damaged (Ha)	
Sumatra	239,251.67	389,504.45	1,408,012.70	2,098,302.82
Bangka Belitung	69,224.84	87,238.69	117,229.29	273,692.82
Java	7,530.27	36,726.41	72,398.62	116,655.30
Nusa Tenggara	19,311.05	30,099.96	9,586.72	58,997.73
Bali	1,553.00	161.00	253.40	1,967.40
Borneo	164,480.89	10,949.00	197,667.94	373,097.83
Papua	1,152,412.00	273,930.00	12,079.00	1,438,421.00
Sulawesi	9,338.86	6,633.21	13,649.49	29,621.56
Total	**1,663,102.58**	**835,242.72**	**1,830,877.16**	**4,390,756.46**

Sources: Dephut, 2012, www.dephut.go.id, accessed November 5, 2012.
River Basin Management Board - BPDAS, Director General RLPS, MOF in 2006 in SoER Indonesia 2007
Fourth National Report The Convention on Biological Biodiversity, Ministry of Environment 2009

Table 7. Protected Areas in Indonesia

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Abun/Jamursba Medi (Sorong)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	4,078,369	2005
Aceh Rafflesia I/II Serbojadi	Nature Reserve	Strict Nature Reserve	-	3	1936
Adonara NR (Adonara Is.)	Nature Reserve	Not Reported	-	20	
Air Sawan	Game Reserve	NR	-	1,400	
Air Terjun Wera	Nature Recreation Park	NR	-	2.5	1980
Ake Tajawi	Nature Reserve	NR	Marine	1,200	
Aketajawe - Lolobata	National Park	NR	-	1,673	2004
Alas Purwo	National Park	NR	Marine	0.43	1992
Alor (Selat Pantar)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	2,971.36	2006
Alur Melidi	Nature Reserve	NR	-	2.5	
Aneuk Laut	Nature Reserve	NR	Marine	10	
Apar Besar	Nature Reserve	NR	Marine	900	
Apo Kayan NR/BR	Other Area	NR	-	1,000	
Arca Domas	Nature Reserve	NR	-	0.02	1913
Aru	National Park	NR	-	1,830	
Ayau-Asia Island (Raja Ampat)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	1,012.291	2007
Bakau Muara Kampar	Game Reserve	NR	Marine	700	
Bakau Perhatu	Wildlife Reserve	NR	Marine	10	
Bakau Selat Dumai	Game Reserve	NR	Marine	600	
Bakiriang	Game Reserve	Habitat/ Species Management Area	Marine	125	1998
Bali Barat	National Park	Natural Park	Marine	190.0289	1995
Baluran	National Park	Natural Park	Marine	250	1980
Banggai Kepulauan (Banggai Kepulauan)	Locally Managed Marine Area	Protected Landscape/Seascape	Marine	3,250	2007
Bangkiriang	Game Reserve	NR	Marine	125	
Bangko-Bangko	Nature Recreation Park	NR	-	21.69	1992
Baning	Nature Recreation Park	NR	-	3.15	1991
Bantar Bolang	Nature Reserve	NR	-	0.24	1930
Bantimurung	Nature Reserve	Strict Nature Reserve	-	10	1980
Bantimurung	Nature Recreation Park	NR	-	0.18	1981
Bantimurung Saraung	National Park	NR	-	480	2004
Banyuwangi	Game Reserve	Habitat/Species Management Area	Marine	620	1919
Baringin Sati	Nature Reserve	NR	-	0.01	1921
Barumun	Wildlife Reserve	NR	-	403.3	1989
Batang Gadis	National Park	NR	-	1,080	2004
Batang Palupuh	Nature Reserve	NR	-	0.03	1930
Batanta Barat	Nature Reserve	Strict Nature Reserve	Marine	100	1981
Batu Angus	Nature Recreation Park	NR	-	6.35	1981
Batu Gajah	Nature Reserve	NR	-	0.01	1924
Batu Ginurit	Nature Reserve	NR	-	0.01	1934
Batu Kristal	Nature Reserve	NR	-	100	
Batu Putih	Nature Recreation Park	NR	-	6.15	1929

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Batugendang Forest	Game Reserve	NR	Marine	100	
Batukau I/II/III	Nature Reserve	NR	-	17.63	1974
Baun Forest	Recreation Park	NR	-	0.37	
Bawean	Wildlife Reserve	Habitat/Species Management Area	Marine	38.32	1979
Bekutuk	Nature Reserve	Strict Nature Reserve	-	0.25	1979
Belat Besar Linau	Other Area	NR	-	5,000	
Bengkayang (Bengkayang)	Recreation Reserve	Protected Landscape/Seascape	Marine	187.3984	2004
Bentayan	Wildlife Reserve	Habitat/Species Management Area	-	193	1981
Berbak	National Park	Natural Park	Marine	1,627	1935
Berbak	Wetlands of International Importance (Ramsar)	NR	Marine	1,627	1992
Beringin Sati	Nature Reserve	Strict Nature Reserve	-	0.01	1921
Berlat	Nature Recreation Park	NR	-	91.94	
Besowo Gadungan	Nature Reserve	NR	-	0.07	1919
Betung Kerihun	National Park	Natural Park	-	8,000	1992
Biak Numfor (Biak)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	343.1588	2009
Biak Utara	Nature Reserve	Strict Nature Reserve	Marine	110	1982
Bintan (Bintan)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	1,815.166	2007
Bintan (Bintan)/Prop Kep Riau	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	10,341.01	2007
Bipolo	Nature Recreation Park	NR	-	3.53	
Bogani Nani Wartabone	National Park	Natural Park	-	2,871.15	1991
Bojong Larang Jayanti	Nature Reserve	Strict Nature Reserve	-	7.5	1973
Bonto Bahari	Game Reserve	Habitat/Species Management Area	Marine	40	1980
Bromo Tengger Semeru	National Park	Natural Park	-	502.76	1982
Bukit Baka - Bukit Raya	National Park	Natural Park	-	1,810.9	1992
Bukit Balai Rejang	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	167	1926
Bukit Balal	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	135.83	1926
Bukit Barisan	Other Area	NR	-	516	1988
Bukit Barisan Selatan	National Park	Natural Park	Marine	3,650	1935
Bukit Barisan Selatan	Grand Forest Park	Natural Park	-	516	
Bukit Batikap I,II and III	Nature Reserve	NR	-		
Bukit Batu	Game Reserve	NR	-	180	
Bukit Batutenobang	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	8,830	
Bukit Besar	Game Reserve	NR	-	2,000	
Bukit Dingin/Gunung Dempo	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	380.5	1926
Bukit Duabelas	National Park	NR	-	605	
Bukit Hitam (Sebag)	Protection Forest	Protected Area With	-	55.2	1932

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
		Sustainable Use of Natural Resources			
Bukit Kaba	Nature Recreation Park	NR	-	134.9	1986
Bukit Mancung	Nature Reserve	NR	-	350	
Bukit Nantiogan Hulu/Nanti Komerung Hulu	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	362	1936
Bukit Perai	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	1,000	
Bukit Raja Mandara	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	485.3	1932
Bukit Raya (Perluasan)	Nature Reserve	NR	-	3,900	
Bukit Rimbang/Baling-baling	Nature Reserve	NR	-	1,360	
Bukit Rongga	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	1,100	
Bukit Sari	Nature Recreation Park	NR	-		
Bukit Sebelah and Batang Pangean	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	228.03	
Bukit Sepat Haung	Nature Reserve	NR	-	2390	
Bukit Soeharto	Nature Recreation Park	Protected Landscape/Seascape	-	618.5	1991
Bukit Tangkiling	Nature Reserve	Strict Nature Reserve	-	20.61	1977
Bukit Tangkiling	Nature Recreation Park	Strict Nature Reserve	-	5.33	1978
Bukit Tigapuluh	National Park	NR	-	1,276.98	
Bulu Saraung	Nature Reserve	Strict Nature Reserve	-	56.9	1980
Bulu Saraung	Nature Reserve	Strict Nature Reserve	-	56.9	1962
Bunaken (Laut)	National Marine Park	Natural Park	Marine	790.6043	1989
Bunga Maskikim	Nature Reserve	NR	-	0.01	1919
Buton Utara	Game Reserve	Habitat/ Species Management Area	Marine	820	1979
Cadas Malang	Nature Reserve	NR	-	0.21	1919
Cagar Alam Laut Aru Tenggara	Marine Park	NR	Marine	1,140	1991
Cani Sirenrang	Nature Recreation Park	NR	-	31.25	1993
Carita	Nature Recreation Park	Protected Landscape/Seascape	-	0.95	1978
Cawang I/II	Nature Recreation Park	NR	-		
Ceding	Nature Reserve	NR	-	0.5	1920
Cendrawasih	National Park	Natural Park	Marine		2002
Ciamis (Ciamis)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	46.79808	2008
Cibanteng	Nature Reserve	Strict Nature Reserve	Marine	4.47	1925
Cibodas Biosphere Reserve (Gunung Gede-Pangrango)	UNESCO-MAB Biosphere Reserve	NA	-	575.32	1977
Cigenteng Cipanji	Nature Reserve	NR	-	0.1	1919
Cikencreng	Game Reserve	NR	-	25	
Cikepuh	Game Reserve	Habitat/ Species Management Area	Marine	81.27	1973

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Cimanggu	Nature Recreation Park	NR	-	1.54	1978
Ciogong	Nature Reserve	NR	-	15	
Corah Manis Sempolan	Nature Reserve	NR	-	0.17	1919
Curug Bengkawah	Nature Reserve	NR	-	0.02	1924
Cut Nyak Dhien/Pocut Merah Intan	Grand Forest Park	NR	-	63	
Danau Belat/Besar Serkap	Game Reserve	NR	-	100	
Danau Bian	Wildlife Reserve	Habitat/ Species Management Area	-	693.9	
Danau Buyan	Nature Recreation Park	NR	-	13.37	
Danau Mahalano	Nature Recreation Park	Protected Landscape/Seascape	Marine	25	1979
Danau Matano	Nature Recreation Park	Protected Landscape/Seascape	-	300	1979
Danau P. Besar/Danau Pulau Bawah	Wildlife Reserve	NR	-	250	1980
Danau Rana Mese	Recreation Park	NR	-	50	
Danau Sanau	Recreation Park	NR	-	40	
Danau Semayang Sungay Mahakam	Other Area	NR	-	2,000	
Danau Sentarum	Wetlands of International Importance (Ramsar)	NA	-	800	1994
Danau Sentarum	National Park	NR	-	1,320	
Danau Tanjung Padang	Game Reserve	NR	-	25	
Danau Tempe	Game Reserve	NR	-	94.45	
Danau Towuti	Nature Recreation Park	Protected Landscape/Seascape	-	650	1979
Danau Tuadale	Wildlife Reserve	NR	-	5	
Dangku	Wildlife Reserve	Habitat/ Species Management Area	-	290.8	1981
Dataran Bena	Hunting Park	Protected Area With Sustainable Use of Natural Resources	Marine	110	1978
Dataran Tinggi Yang	Wildlife Reserve	NR	-	141.45	1962
Depok	Nature Reserve	Protected Landscape/Seascape	-	0.06	1913
Derawan (Berau)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	12,378.08	2005
Desa Olele (Bonebolango - Gorontalo)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	0.117986	2006
Despatah I/II	Nature Reserve	NR	-	0.01	1932
Dolangan	Game Reserve	Habitat/ Species Management Area	Marine	4.63	1981
Dolok Saut/Sulungan	Nature Reserve	NR	-	0.39	1924
Dolok Sibual-bual	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	339.1	
Dolok Sipirok	Nature Reserve	Strict Nature Reserve	-	69.7	1982
Dolok Surungan	Wildlife Reserve	Habitat/ Species Management Area	-	238	1974
Dolok Tinggi Raja	Nature Reserve	NR	-	1.67	1924
Dolok Toinggi Raja	Other Area	NR	-	157.65	
Dr. Muhammad Hatta	Grand Forest Park	NR	-	5	1986

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Dua Saudara	Nature Reserve	Strict Nature Reserve	Marine	42.99	1978
Dungus Iwul	Nature Reserve	NR	-	0.09	1931
Dusun Besar	Nature Reserve	NR	-	17.77	1992
Egon-Iliwuli	Nature Reserve	NR	-	149.25	
Eko boyo	Game Reserve	NR	Marine	17.5	
Enarotali	Nature Reserve	Strict Nature Reserve	-	3,000	1980
Foja	Game Reserve	Habitat/ Species Management Area	-	10,180	
Gebugan (Gunung Ungaran)	Nature Reserve	NR	-	0.02	1924
Getas	Nature Reserve	NR	-	0.01	1930
Giam Duri	Nature Reserve	NR	-	400	
Giam Siak Kecil-Bukit Batu	UNESCO-MAB Biosphere Reserve	NR	-	7052.71	2009
Gili Banta (Bima)	Recreation Reserve	Protected Landscape/Seascape	Marine	67.93722	2005
Gili Sulat, Gili Lawang (Lombok Timur)	Recreation Reserve	Protected Landscape/Seascape	Marine	17.92953	2004
Gn. Rinjani	National Park	Natural Park	-	400	1929
Gn. Tangkuban Perahu (Badung)	Nature Reserve	NR	-	12.9	
Goa Patunuang	Nature Recreation Park	NR	-	15	1987
Grojogan Sewu	Nature Recreation Park	NR	-	0.64	1968
Gua Ngilirip	Nature Reserve	NR	-	0.03	1919
Guci	Nature Reserve	NR	-	0.02	1924
Gumai Pasemah	Wildlife Reserve	Habitat/ Species Management Area	-	458.33	1976
Gunung Abang	Nature Reserve	NR	-	0.5	1978
Gunung Abang	Game Reserve	NR	-	30	
Gunung Ambang	Nature Reserve	Strict Nature Reserve	-	86.38	1978
Gunung Ambang (Perluasan)NR	Nature Reserve	NR	-	111.2	
Gunung Ambu Lombo	Nature Reserve	NR	-	50	
Gunung Api	Nature Reserve	Strict Nature Reserve	Marine	0.8	1937
Gunung Api Banda	Recreation Park	Protected Landscape/Seascape	Marine	7.3446	1992
Gunung Arnau	Nature Reserve	NR	-	450	
Gunung Batu Gamping	Nature Reserve	NR	-		1982
Gunung Baung	Nature Recreation Park	NR	-	1.96	1981
Gunung Beratus	Nature Reserve	NR	-	1,300	
Gunung Berau	Nature Reserve	NR	-	1,100	
Gunung Beser	Nature Reserve	NR	-	40	
Gunung Betung	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	222.44	
Gunung Boliyohuto	Protection Forest	NR	-		
Gunung Burangrang	Nature Reserve	Strict Nature Reserve	-	27	1979
Gunung Butak	Nature Reserve	Strict Nature Reserve	-	0.45	1975
Gunung Celering	Nature Reserve	Strict Nature Reserve	-	13.28	1989
Gunung Ciremai	National Park	NR	-	155	2004
Gunung Gamkonora	Game Reserve	NR	-	320	
Gunung Gamping	Nature Recreation Park	NR	-	0.01	1982
Gunung Gede Pangrango	National Park	Natural Park	-	150	1980
Gunung Guntur	Nature Recreation Park	NR	-	2.5	

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Gunung Jagat	Nature Reserve	Strict Nature Reserve	-	1.27	1954
Gunung Karang	Nature Reserve	NR	-	25	
Gunung Kawi/Kelud	Nature Reserve	NR	-	500	
Gunung Kelam	Nature Recreation Park	NR	-	5.2	1992
Gunung Kelapat Muda	Game Reserve	NR	Marine	1,450	
Gunung Kendeng	Nature Reserve	NR	-	5	
Gunung Kentawan	Nature Reserve	NR	-	2.45	1979
Gunung Langgaliru	Nature Reserve	Strict Nature Reserve	-	156.39	1992
Gunung Lawu	Nature Reserve	NR	-	60	
Gunung Leuser	National Park	Natural Park	-	7,926.75	1980
Gunung Leuser National Park	UNESCO-MAB Biosphere Reserve	NR	-	7,926.75	1981
Gunung Liman Wilis	Game Reserve	NR	-	450	
Gunung Liman Wilis	Nature Reserve	NR	-	12.04	
Gunung Limbung	Game Reserve	NR	-		
Gunung Lokon	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	39.3	1939
Gunung Lokon	Nature Reserve	Protected Area With Sustainable Use of Natural Resources	-	1	1919
Gunung Lompobatang	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-		
Gunung Lorentz	National Park	Natural Park	Marine	25,050	1997
Gunung Lorentz	National Park	NR	-	21,500	
Gunung Lorentz Addition	Other Area	NR	-		
Gunung Lumut	Nature Reserve	NR	-	300	
Gunung Manembu-Nembu	Wildlife Reserve	Habitat/ Species Management Area	-	65	1978
Gunung Masigit	Nature Reserve	NR	-	90	
Gunung Masigit Kareumbi	Game Reserve	Protected Landscape/Seascape	-	124.21	1976
Gunung Mega Mendung	Nature Reserve	Strict Nature Reserve	-	0.5	1979
Gunung Meja	Nature Recreation Park	Protected Landscape/Seascape	-	4.6	1980
Gunung Merapi	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	96.7	1916
Gunung Merbabu	National Park	NR	-	64.1	2005
Gunung Muna	Nature Reserve	NR	-	150	
Gunung Muria	Nature Reserve	NR	-	120	
Gunung Mutis	National Park	NR	-	900	
Gunung Mutis	Nature Reserve	NR	-	120	
Gunung Nanu'a	Game Reserve	Protected Area With Sustainable Use of Natural Resources	Marine	100	1978
Gunung Niut Penrisen	Nature Reserve	Habitat/ Species Management Area	-	1,800	1982
Gunung Olet Sangenges NR (Sumbawa Is.)	Nature Reserve	NR	-	350	
Gunung Palung	National Park	Natural Park	Marine	900	1990
Gunung Pancar	Nature Recreation Park	NR	-	4.47	1988
Gunung Pangasaman	Hunting Park	NR	-	340	
Gunung Papandayan	Nature Reserve	Strict Nature Reserve	-	66.2	1924
Gunung Papandayan	Recreation Park	Protected	-	2.21	1978

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
		Landscape/Seascape			
Gunung Patah/Bepagut/Muara Duakisim	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	916.55	1936
Gunung Perahu	Game Reserve	NR	-	250	
Gunung Picis	Nature Reserve	Natural Monument or Feature	-	0.27	1924
Gunung Raung	Nature Reserve	NR	-	600	
Gunung Raya	Wildlife Reserve	Habitat/ Species Management Area	-	395	1978
Gunung Raya Pasi	Nature Reserve	Strict Nature Reserve	-	37	1978
Gunung Raya Pasi	Nature Reserve	Strict Nature Reserve	-	37	
Gunung Ringgit	Nature Reserve	NR	Marine	20	
Gunung Rinjani	National Park	Natural Park	-	400	1990
Gunung Sabatai	Nature Reserve	NR	-	450	
Gunung Sago/Malintang/Karas	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	54.86	
Gunung Sahendaruman	Other Area	NR	-	50	
Gunung Salawah Agam	Nature Reserve	NR	-	60	
Gunung Sawai	Wildlife Reserve	Habitat/ Species Management Area	-	54	1979
Gunung Sebatang	Nature Reserve	Strict Nature Reserve	-	2.5	1982
Gunung Selok	Recreation Park	Protected Landscape/Seascape	Marine	1.26	1975
Gunung Sibela	Nature Reserve	Strict Nature Reserve	-	230.24	
Gunung Sigogor	Nature Reserve	NR	-	1.91	1936
Gunung Simbalang	Protection Forest	NR	-	150	
Gunung Simpang	Nature Reserve	Strict Nature Reserve	-	150	1979
Gunung Singgalang	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	96.58	
Gunung Slamet	Nature Reserve	NR	-	150	
Gunung Sojol	Nature Reserve	NR	-	500	
Gunung Soputan	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	134.33	1933
Gunung Sumbing	Nature Reserve	NR	-	100	
Gunung Tampomas	Nature Recreation Park	NR	-	12.5	1979
Gunung Tilu	Nature Reserve	Strict Nature Reserve	-	80	1978
Gunung Timau	Forest Reserve	Protected Area With Sustainable Use of Natural Resources	-	150	
Gunung Tukung Gede	Nature Reserve	Strict Nature Reserve	-	17	1979
Gunung Tunggal	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	508.3	
Gunung Unggaran	Nature Reserve	NR	-	55	
Gunung Wagura-Kote	Nature Reserve	NR	-	150	
Hadekawa-Labelakang	Game Reserve	NR	-	124.9	
Halimun	National Park	NR	-	400	1992
Halmahera	National Park	NR	-	4,580	
Harlu	Wildlife Reserve	NR	-	20	1993
Herman Yohannes	Grand Forest Park	NR	-	19	
Holiday Resort	Nature Recreation Park	NR	-	16.94	1990
Hutan Dompu Complex GR (Sumbawa Is.)	Game Reserve	NR	-	100	

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Hutan Kapur Sangkulirang	Nature Reserve	NR	-	2,000	
Hutan Lunang	Nature Reserve	NR	-	177	
Hutan Pinus/Janthoi	Nature Reserve	Strict Nature Reserve	-	80	1984
Hutan Sambas	Nature Reserve	NR	-	1,200	
Inggresau	Nature Reserve	NR	Marine	2.8	
Ir. H. Juanda	Grand Forest Park	NR	-	5.9	1979
Ir. Juanda	Grand Forest Park	Protected Area With Sustainable Use of Natural Resources	-	5.9	1985
Isau-isau Pasemah	Wildlife Reserve	Habitat/ Species Management Area	-	121.44	1978
Istana Sultan Siak	Recreation Park	NR	-	0.05	
Jamdena	Nature Reserve	NR	Marine	600	
Jamursba Medi	National Park	NR	Marine	4,651.79	
Jamursba-Mandi	Nature Reserve	NR	Marine	9	
Janggangan	Nature Reserve	Strict Nature Reserve	-	0.09	1919
Jayabaya	Recreation Park	NR	-	5	
Jayawijaya	Wildlife Reserve	Habitat/ Species Management Area	-	8,000	1981
Jayawijaya (Extension - Northern)	Other Area	NR	-		
Jayawijaya (Extension - Southern)	Other Area	NR	-		
Jayawijaya Addition	Other Area	NR	-		
Jember	Nature Recreation Park	NR	-	0.5	1979
Jorongmaligi (Pasaman Barat)	Marine Conservation Area (Freshwater)	Protected Area With Sustainable Use of Natural Resources	Marine	775.9123	2007
Kai Besar	Nature Reserve	NR	Marine	370	
Kaimana (Kaimana)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	5,433.808	2008
Karaenta	Nature Reserve	Strict Nature Reserve	-	10	1976
Karakelang Utara dan Selatan	Wildlife Reserve	Protected Area With Sustainable Use of Natural Resources	-	214	1979
Karang Bolong	Nature Reserve	Strict Nature Reserve	Marine	0.01	1937
Karang Gading Langkat Timur Laut	Game Reserve	Habitat/ Species Management Area	Marine	157.65	1980
Karang Kamulyan	Nature Reserve	NR	Marine	0.25	
Kateri	Wildlife Reserve	NR	-	45.6	1981
Kaur (Kaur)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	572.7638	2007
Kawah Ijen	Nature Recreation Park	NR	-	0.92	1981
Kawah Ijen	National Park	NR	-	382.4	2004
Kawah Ijen Ungup-Ungup	Nature Reserve	NR	-	24.68	1920
Kawah Kamojang	Nature Recreation Park	Protected Landscape/Seascape	-	5	1979
Kawah Kamojang	Nature Reserve	Strict Nature Reserve	-	75.36	1979
Kawe / Kep. Wayag Sayang / Kep. Panjang	Nature Reserve	Habitat/ Species Management Area	Marine	1,545.64	2009
Kaya Kuku	Nature Reserve	NR	Marine	100	
Kaya Kuku NR (Kalimantan)	Nature Reserve	NR	-	50	
Kayan Mentarang	National Park	Natural Park	-	13,605	1996
Kelimutu	National Park	NR	-	50	1992

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Keling I, II and III	Nature Reserve	Strict Nature Reserve	-	0.66	1919
Kelompok (Ext)	Other Area	NR	-	2550	
Kelompok Hutan Bakau Pantai Timur	Nature Reserve	Strict Nature Reserve	Marine	65	1981
Kelompok Hutan Bulian Lucuk I/II	Nature Reserve	NR	-	0.75	1987
Kelompok Hutan Buol Toli-toli	Nature Reserve	NR	-	5000	
Kelompok Hutan Kahayan	Game Reserve	NR	Marine	1500	
Kep. Banyak (or Kepulauan Banyak)	Nature Recreation Park	Protected Landscape/Seascape	Marine	2275	
Kepulauan Anambas dan Laut Sekitarnya	Recreation Park	Protected Landscape/Seascape	Marine	12,626.86	2011
Kepulauan Aru Bagian Tenggara	Nature Reserve	Strict Nature Reserve	Marine	1,913.293	2009
Kepulauan Asia dan Ajoe	Wildlife Sanctuary	NR	Marine	764.06	
Kepulauan Hinako (Nias Selatan)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	228.2785	2008
Kepulauan Kapoposang	Recreation Park	Protected Landscape/Seascape	Marine	560.11	2009
Kepulauan Karimata	Nature Reserve	Strict Nature Reserve	Marine	770	1985
Kepulauan Karimun Jawa	National Park	Natural Park	Marine	1,116.25	1986
Kepulauan Mentawai (Kepulauan Mentawai)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	648.9867	2006
Kepulauan Padaido	Recreation Park	Protected Landscape/Seascape	Marine	848.64	2009
Kepulauan Padamarang	Nature Recreation Park	NR	Marine	36	
Kepulauan Raja Ampat	Nature Reserve	Habitat/ Species Management Area	Marine	632.01	2009
Kepulauan Seribu (Laut)	Marine National Park	Natural Park	Marine	1,080	1995
Kepulauan Togian	Nature Reserve	NR	Marine	3,620	2004
Kepulauan Tukang Besi	Game Reserve	NR	Marine	2,000	
Kepulauan Waigeo Sebelah Barat (Kepulauan Panjang)	Nature Reserve	Strict Nature Reserve	Marine	1,208.701	2009
Kepulauan Wakatobi (Laut)	National Park	Natural Park	Marine	13,900	2002
Kerandangan	Nature Recreation Park	NR	-	3.2	1992
Kerinci Seblat	National Park	Natural Park	-	13,750	1999
Kerinci Seblat National Park	ASEAN Heritage	NR	-	13,860	2004
Kerumutan	Wildlife Reserve	Habitat/ Species Management Area	-	1,200	1979
Kerumutan Lama	Game Reserve	NR	-	550	
Klamono	Nature Recreation Park	Habitat/ Species Management Area	-	19.09	
Kofiau and Boo Islands (Raja Ampat)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	1,579.082	2007
Kokinawe	Game Reserve	NR	Marine	50	
Komara	Game Reserve	NR	-	46.1	1987
Komara	Wildlife Reserve	Habitat/ Species Management Area	-	33.9	
Komodo	National Park	Natural Park	Marine	1,817	1980
Komodo	UNESCO-MAB Biosphere Reserve	NR	Marine	1,733	1977
Komodo	National Park	Natural Park	Marine	1817	1980

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Komodo National Park	World Heritage Site	NR	Marine	2,193.22	1991
Konak	Nature Reserve	NR	-	0.01	1932
Kota Batam (Batam)	Marine Management Area	Protected Area With Sustainable Use of Natural Resources	Marine	1,159.467	2007
Kuala Jambu Aye	Nature Reserve	NR	Marine	30	
Kuala Kayan	Nature Reserve	NR	Marine	735	
Kuala Langsa	Nature Reserve	NR	Marine	70	
Kuala Lupak	Wildlife Reserve	Habitat/ Species Management Area	Marine	33.75	1999
Kuala Tapas	Nature Reserve	NR	Marine	80	
Kumbe-Merauke	Nature Reserve	NR	-	1,268.1	
Kurung Baya/Varanus	Game Reserve	NR	Marine		
Kutai	National Park	Natural Park	Marine	1,986.29	1982
Kutai (Ext)	Other Area	NR	-	455.8	
Kwangtung Island	Sanctuary	Habitat/ Species Management Area	Marine	0.57	1977
Lamandau	Nature Reserve	NR	-	761.1	
Lambu Sango NR	Game Reserve	NR	-		
Lamedae	Nature Reserve	Strict Nature Reserve	-	5	1974
Lamiko-miko	Nature Reserve	NR	Marine	50	
Lampoko Mampie	Game Reserve	Habitat/ Species Management Area	Marine	20	1978
Lampung Barat (Lampung Barat)	Coastal Park	Protected Landscape/Seascape	Marine	46.6418	2007
Landusa Tomata	Game Reserve	NR	-	50	
Langsa Kemuning	Nature Reserve	NR	-	10	
Lasolo-Sampara	Nature Reserve	NR	-	450	
Lejja	Nature Recreation Park	NR	-	12.65	
Lembah Anai	Nature Reserve	NR	-	2.21	1922
Lembah Harau	Recreation Park	Protected Landscape/Seascape	-	0.28	1979
Lembah Harau	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	234.67	1933
Lembah Harau	Nature Reserve	Strict Nature Reserve	-	2.7	1933
Leuser National Park	ASEAN Heritage	NR	-	10,946.92	2004
Leuwang Sancang and Perairan	Nature Reserve	Strict Nature Reserve	Marine	33.07	1978
Lewotobi	Protection Forest	NR	Marine	42	
Liang Balik	Nature Reserve	NR	-	0.01	1936
Lifamatola	Nature Reserve	NR	-	16.91	
Lingga Isaq	Game Reserve	Protected Area With Sustainable Use of Natural Resources	-	800	1978
Linggarjati	National Park	NR	-	0.12	1975
Lo Pat Fun Pi	Nature Reserve	NR	-	0.08	1936
Lolobata	Game Reserve	NR	-	1,890	
Lombuyan I and II	Wildlife Reserve	Habitat/ Species Management Area	-	36.65	1974
Long Bangun	Nature Reserve	NR	-	3,500	
Lore Lindu	National Park	Natural Park	-	2,290	1982
Lore Lindu National Park	UNESCO-MAB Biosphere Reserve	NR	-	2,179.82	1977
Lorentz National Park	World Heritage Site	NR	-	23,500	1999
Lorentz National Park	ASEAN Heritage	NR	-	23,500	2004
Luku Meloto	Nature Reserve	NR	-	40	

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Malabar	Nature Reserve	NR	-	0.08	1912
Malampah Alahan Panjang	Nature Reserve	NR	-	369.19	
Malino	Nature Recreation Park	NR	-	35	1991
Mamberamo-Pegunungan Foja	Wildlife Reserve	Wilderness Area	Marine	10180	
Mambuliling	Game Reserve	NR	-	100	
Mamuja/Tapalang	Game Reserve	NR	Marine	125	
Mandor	Nature Reserve	Strict Nature Reserve	-	20	1937
Manepeu -Tanah Daru	National Park	NR	Marine	879.84	
Manggis Gadungan	Nature Reserve	NR	-	0.12	1919
Mangolo	Nature Recreation Park	NR	-	52	
Maninjau (North and South)	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	221.06	1920
Manipo	Nature Recreation Park	Protected Landscape/Seascape	-	25	1992
Manna	Nature Recreation Park	NR	-		
Manupeu	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	120	
Manusela	National Park	Natural Park	Marine	1,890	1982
Marisa	Other Area	NR	-	30	
Martelu Purba	Protection Forest	NR	-	1.95	1916
Mas Popaya Raja	Nature Reserve	Strict Nature Reserve	Marine	1.6	1939
Masbait	Nature Reserve	NR	-	62.5	
Maubesi	Nature Reserve	Strict Nature Reserve	Marine	18.3	1981
Mawuk	Nature Reserve	NR	Marine	10	
Mega Mendung	Nature Recreation Park	NR	-	0.13	1974
Meratus	National Park	NR	-	183.5	
Meratus Hulu Barabai	Nature Reserve	NR	-	2,000	
Meru Betiri	National Park	Natural Park	Marine	500	1982
Mingima	Wildlife Sanctuary	Wilderness Area	-	35	
Misool Selatan	Nature Reserve	Strict Nature Reserve	Marine	840	1982
Moga	Nature Reserve	NR	-	0.01	1924
Morowali	Nature Reserve	Strict Nature Reserve	Marine	2,250	1986
Muara Angke	Nature Reserve	Strict Nature Reserve	Marine	0.25	1988
Muara Bobos	Game Reserve	NR	Marine	50	
Muara Cimanuk	Nature Reserve	NR	Marine	71	
Muara Gembong	Nature Reserve	NR	Marine	8	
Muara Kaman Sedulang	Nature Reserve	Strict Nature Reserve	-	625	1976
Muara Kayan	Nature Reserve	NR	Marine	800	
Muara Kendawangan	Nature Reserve	NR	Marine	1,500	
Muara Sebuku	Nature Reserve	NR	Marine	1,100	
Muara Siberut	Nature Reserve	NR	Marine	120	
Muara Sungai Guntung	Nature Reserve	NR	Marine	260	
Mubrani-Kaironi	Nature Reserve	Wilderness Area	Marine	10	
Muka Kuning (Batam)	Nature Recreation Park	NR	-	20.66	
Muller Schwart	National Park	NR	-	8,600	
Murhum	Grand Forest Park	NR	-	81.46	
Nabire	Recreation Park	Protected Landscape/Seascape	-	1	1980
Nanggala III	Nature Recreation Park	NR	-	5	1932

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Nantu	Wildlife Reserve	NR	-	320	1999
Nantu Boliyohuto	National Park	NR	-	520	
Napabalano	Nature Reserve	Strict Nature Reserve	Marine	0.09	1919
Natuna (Natuna)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	1,424.807	2007
Ngargoyoso	Grand Forest Park	NR	-	2.31	
Ngurah Rai	Grand Forest Park	NR	-	13.74	
Nias (Nias)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	292.0572	2007
Nunukan (Nunukan)	Nature Reserve	Strict Nature Reserve	Marine	2	2007
Nuraksa	Grand Forest Park	NR	-	31.55	
Nusa Barung	Nature Reserve	Strict Nature Reserve	Marine	61	1920
Nusa Gede Pandjalu	Nature Reserve	Strict Nature Reserve	-	0.16	1919
Nusa Kambagan Barat	Nature Reserve	Strict Nature Reserve	-	9.28	1937
Nusa Kambagan Timur	Nature Reserve	NR	Marine	2.77	
Nusakambangan	Nature Reserve	Strict Nature Reserve	Marine	9.28	1937
P. Rambut and Perairan	Wildlife Reserve	NR	-	0.9	
P. Soeryo	Grand Forest Park	NR	-	250	
P. Ujung, P. Tengah, P. Angsa, P. Kasiak (Pariaman)	Recreation Reserve	Protected Landscape/Seascape	Marine	24.77042	2006
Paboya	Nature Reserve	Strict Nature Reserve	-	10	1973
Padang Lawas	Hunting Park	NR	-	687	
Padang Luwai	Nature Reserve	NR	-	50	1967
Padang Sugihan	Wildlife Reserve	Habitat/ Species Management Area	-	750	1983
Pager Gunung I/II/III	Nature Reserve	NR	-	0.01	1932
Pager Wunung Darupono	Nature Reserve	NR	-	0.3	1933
Palau Waigeo Timur	Nature Reserve	NR	-	1195	
Palu	Grand Forest Park	NR	-	81	
Pamukan	Nature Reserve	NR	Marine	100	
Pananjung	National Park	NR	Marine	5.3	
Pananjung Pangandaran	Nature Reserve	Strict Nature Reserve	Marine	4.19	1934
Pananjung Pangandaran	National Park	NR	Marine	0.38	1978
Pancoran Mas	Grand Forest Park	NR	-	0.06	
Pancur Ijen I, II	Nature Reserve	NR	-	0.09	1919
Panelokan (Bali)	Nature Recreation Park	NR	-	5.4	1978
Pangandaran	Recreation Park	Protected Landscape/Seascape	-	0.38	1978
Pangi Binanga	Nature Reserve	NR	Marine	60	
Pangumbahan, Kec Ciracap (Sukabumi)	Coastal Park	Protected Landscape/Seascape	Marine	28.3693	2008
Pantai Palolowaru	Recreation Park	NR	Marine	1	
Pantai Samarinda	Nature Reserve	NR	Marine	950	
Pantai Ujungnegoro Roban (Batang)	Coastal Park	Protected Landscape/Seascape	Marine	25.83404	2006
Panua	Nature Reserve	Strict Nature Reserve	Marine	450	1984
Paraduan Gistana and Surroundings	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	700	1936
Pararawen Baru	Nature Reserve	NR	-	815	
Pararawen I / II	Nature Reserve	Strict Nature Reserve	-	62	1979
Pasir Salam	Game Reserve	NR	-	35	
Pati-Pati	Game Reserve	Habitat/ Species Management Area	Marine	1.98	1936
Pegunungan Arfak	Nature Reserve	Habitat/	-	683.25	

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
		Species Management Area			
Pegunungan Buol Toli Toli	Game Reserve	NR	-	5,000	
Pegunungan Cyclops	Nature Reserve	Strict Nature Reserve	Marine	225	1978
Pegunungan Fakfak	Nature Reserve	NR	Marine	510	
Pegunungan Feruhumpenai	Nature Reserve	Strict Nature Reserve	-	900	1979
Pegunungan Kumawa	Nature Reserve	NR	Marine	1,180	
Pegunungan Latimojong	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	580	1940
Pegunungan Pembarisan	Nature Reserve	NR	-	130	
Pegunungan Tamrau Selatan	Nature Reserve	NR	-	2,478.75	
Pegunungan Weyland	Nature Reserve	NR	-	2,230	
Pelangan	Nature Recreation Park	NR	-	5	1990
Perairan Kangean	Game Reserve	NR	Marine	30	
Perairan Pulau Peleng-Pulau Pulau Banggai	Nature Reserve	NR	Marine		
Perairan Pulau Weh and P. Beras	Nature Reserve	NR	Marine		
Perairan Sungai Mahakam	Nature Reserve	NR	-	2,000	
Peranap	Hunting Park	NR	-	1,200	
Perhalu	Game Reserve	Habitat/ Species Management Area	-	10	1993
Peson Subah I, II	Nature Reserve	Strict Nature Reserve	-	0.3	1919
Pinjam/Tanjung Mantop	Game Reserve	Habitat/ Species Management Area	Marine	16.13	1981
Plawangan Turgo	Nature Reserve	NR	-	0.68	1984
Plawangan Turgo	Nature Recreation Park	NR	-	1.31	1984
Pleihari	Nature Recreation Park	NR	-	15	1991
Pleihari Tanah Laut	Wildlife Reserve	Habitat/ Species Management Area	Marine	60	1975
Polewai	Game Reserve	NR	Marine	80	
Ponda-Ponda	Nature Reserve	Strict Nature Reserve	Marine	0.7722	1999
Pringombo I, II	Nature Reserve	Strict Nature Reserve	-	0.58	1924
Pulau Alang Besar/ Sinebu	Game Reserve	NR	Marine	150	
Pulau Anak Krakatau	Nature Reserve	Strict Nature Reserve	Marine	137.35	1990
Pulau Anggrameos	Wildlife Sanctuary	NR	Marine		
Pulau Angwarmase	Nature Reserve	Strict Nature Reserve	Marine	8	1978
Pulau Babar	Other Area	NR	Marine		
Pulau Bakut	Nature Recreation Park	Protected Landscape/Seascape	Marine	0.187	2003
Pulau Baun	Game Reserve	Habitat/ Species Management Area	Marine	130	1974
Pulau Bawean	Nature Reserve	NR	-	7.25	1979
Pulau Bengkaru	Nature Reserve	NR	Marine	4	
Pulau Berkeh	Nature Reserve	Strict Nature Reserve	Marine	4	1968
Pulau Besar	Recreation Park	Protected Landscape/Seascape	Marine	30	1986
Pulau Biak (Parieri)	Recreation Park	NR	-	20	
Pulau Biawak (Indramayu)	Recreation Reserve	Protected Landscape/Seascape	Marine	897.4923	2004
Pulau Bokor	Nature Reserve	Strict Nature Reserve	Marine	0.15	1921
Pulau Bulan	Game Reserve	NR	Marine	120	
Pulau Bunaken	Nature Reserve	Strict Nature Reserve	Marine	752.65	1986
Pulau Burung	Nature Reserve	NR	Marine	2	1968

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Pulau Damar	Other Area	NR	Marine	156	
Pulau Dana	Game Reserve	NR	Marine	10	
Pulau Dolok Extension	Game Reserve	NR	-	4,204	
Pulau Dolok Kimaam	Game Reserve	Habitat/ Species Management Area	Marine		1978
Pulau Dua	Nature Reserve	Strict Nature Reserve	Marine	0.6	1984
Pulau Gili Ayer Gili Meno dan Gili Trawangan	Recreation Reserve	Protected Landscape/Seascape	Marine	22.05872	2009
Pulau Kaget	Nature Reserve	Strict Nature Reserve	Marine	0.85	1976
Pulau Kambing	Game Reserve	NR	-	40	
Pulau Kasa	Recreation Park	Protected Landscape/Seascape	Marine	11	1978
Pulau Kasa	Game Reserve	Habitat/ Species Management Area	Marine	9	1978
Pulau Kayu Adi (Selayar)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	10.33219	2009
Pulau Kembang	Nature Recreation Park	Protected Landscape/Seascape	Marine	0.6	1976
Pulau Kobroor	Game Reserve	NR	Marine	1,700	
Pulau Larat	Nature Reserve	NR	-	45.05	
Pulau Laut	Nature Reserve	Strict Nature Reserve	Marine	4	1968
Pulau Laut barat-Selatan dan Pulau Sembilan (Kota)	Recreation Park	Protected Landscape/Seascape	Marine	220.99	2005
Pulau Lituwongkidi (Buton)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	2994.247	2005
Pulau Manuk	Game Reserve	Habitat/ Species Management Area	Marine	1	1981
Pulau Manuk Woha	Collaborative Fishery Management Area	NR	Marine		
Pulau Mapia	Wildlife Sanctuary	NR	Marine	40.15	
Pulau Maratua-Karang Muaras	Nature Reserve	NR	Marine	1100	
Pulau Marsegu dsk	Nature Recreation Park	NR	-	110	
Pulau Moyo	Game Reserve	Protected Area With Sustainable Use of Natural Resources	Marine	222.5	1986
Pulau Moyo	Recreation Park	Protected Landscape/Seascape	Marine	60	1986
Pulau Ndana	Game Reserve	NR	-	15.62	1993
Pulau Nias	Game Reserve	NR	Marine	479.49	
Pulau Noko and Pulau Nusa	Nature Reserve	Natural Monument or Feature	Marine	0.15	1926
Pulau Numfor	Nature Reserve	NR	-	15	
Pulau Nustaram	Nature Reserve	Strict Nature Reserve	Marine	32	1978
Pulau Nuswotar	Nature Reserve	Strict Nature Reserve	Marine	75	1978
Pulau Obi	Nature Reserve	NR	-	150	
Pulau Panjang	Game Reserve	NR	Marine	100	
Pulau Pasir Panjang	Recreation Park	NR	Marine	0.1	
Pulau Penyengat	Recreation Park	NR	Marine	0.1	
Pulau Penyu	Nature Reserve	NR	Marine	20	
Pulau Penyu (Pesisir Selatan)	Recreation Reserve	Protected Landscape/Seascape	Marine	1,270.061	2003
Pulau Pieh dan perariran	Recreation Reserve	Protected Landscape/Seascape	Marine	349.907	2009
Pulau Pini	Game Reserve	NR	-	83.5	
Pulau Pombo	Recreation Park	Protected	Marine	9.98	1973

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
		Landscape/Seascape			
Pulau Pombo	Nature Reserve	NR	Marine	0.02	
Pulau Rakit	Recreation Park	NR	Marine	20	
Pulau Rambut	Nature Reserve	Strict Nature Reserve	Marine	0.18	1939
Pulau Rempang	Game Reserve	Protected Area With Sustainable Use of Natural Resources	Marine	160	1986
Pulau Rusa	Game Reserve	NR	Marine	14.06	
Pulau Samosir	Other Area	NR	-		
Pulau Sangalaki	Recreation Park	Protected Landscape/Seascape	Marine	2.8	
Pulau Sangiang	Nature Reserve	Strict Nature Reserve	Marine	7	1985
Pulau Sangiang	Nature Recreation Park	Strict Nature Reserve	-	12.28	
Pulau Satonda	Nature Recreation Park	NR	Marine	26	
Pulau Satonda	Nature Recreation Park	NR	Marine	26	
Pulau Sayang	Wildlife Sanctuary	NR	Marine	104.68	
Pulau Seho	Nature Reserve	NR	Marine	12.5	1972
Pulau Selayar (Selayar)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	33.40877	2009
Pulau Semama	Game Reserve	Habitat/ Species Management Area	Marine	2.2	1982
Pulau Sempu	Nature Reserve	Strict Nature Reserve	Marine	8.77	1928
Pulau Simeulue	Game Reserve	NR	Marine	267.5	
Pulau Supriori	Nature Reserve	Strict Nature Reserve	Marine	420	1982
Pulau Taliabu	Nature Reserve	NR	Marine	700	
Pulau Una-una	Nature Reserve	NR	-	108	
Pulau Waigeo	Nature Reserve	Strict Nature Reserve	Marine	1,530	1982
Pulau Weh	Recreation Park	Protected Landscape/Seascape	Marine	39	1982
Pulau Yapen Tengah	Nature Reserve	Strict Nature Reserve	Marine	590	1982
Pungguk Benakat	Nature Recreation Park	NR	-	11.22	1991
Punguk Bingin	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	24	
Punti Kayu	Nature Recreation Park	NR	-	0.5	1985
Raja Ampat	Nature Reserve	Wilderness Area	Marine	29.76	
Raja Lelo	Grand Forest Park	NR	-	11.22	
Rangkong	Game Reserve	NR	-	590	
Rantau Pala Gajah	Nature Reserve	NR	Marine	16	
Rawa Aopa Watumohai	National Park	Natural Park	Marine	1051.94	1989
Rawa Cipanggang	Nature Reserve	NR	-	1.25	1940
Rawa Danau	Nature Reserve	Strict Nature Reserve	-	25	1921
Rawa Singkil	Wildlife Reserve	NR	-	1,025	
Rebang	Nature Reserve	NR	-	135	
Rimbo Panti	Nature Recreation Park	NR	-	5.7	1979
Rimbo Panti	Nature Reserve	NR	-	28.3	1934
Riung	Nature Recreation Park	NR	-	20	
Rompi	Hunting Park	NR	-	150	
Ruteng	Nature Recreation Park	NR	-	322.49	1993

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Rutong	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	410	1939
Sabuda Tataruga	Wildlife Reserve	NR	Marine	50	1990
Sahuwai	Nature Reserve	NR	-	186.2	
Saketa	Nature Reserve	NR	-	1,200	
Salatri	Nature Reserve	NR	-	10	
Salawati Utara	Nature Reserve	Strict Nature Reserve	Marine	570	1990
Sangeh	Nature Recreation Park	NR	-	139.69	1993
Saobi (Kangean)	Nature Reserve	NR	-	4.3	1926
Sarang Barung	Game Reserve	NR	-		
Sausapor	Nature Reserve	NR	Marine		
Sebangau	National Park	NR	-	5,687	2004
Seberida	Nature Reserve	NR	-	1,200	
Segara Anakan	Nature Reserve	NR	Marine	153.52	
Sei Prapat Simandulang	Nature Reserve	NR	Marine	29	
Selah Legium Complex PrFo (Sumbawa Is.)	Protection Forest	NR	Marine	500	
Selat Dampier (Raja Ampat)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	3,000.479	2007
Selat Muna	Game Reserve	NR	Marine		
Selat Tiworo (Muna)	Recreation Reserve	Protected Landscape/Seascape	Marine	296.1709	2004
Sembilang	National Park	NR	Marine	2,050.78	
Semidang Bukit Kabu	Game Reserve	Protected Area With Sustainable Use of Natural Resources	-	153	1973
Senayang Lingga (Lingga)	Coral Reef Management Area	Protected Area With Sustainable Use of Natural Resources	Marine	26,752.8	2002
Sepakung	Nature Reserve	NR	-	0.03	1924
Sepanjang	National Park	NR	Marine	339	2004
Serdang Bedagai (Serdang Bedagai)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	2.005439	2008
Sesulu	Nature Reserve	NR	-	30	
Siak Kecil	Nature Reserve	NR	-	350	
Siberut	UNESCO-MAB Biosphere Reserve	NR	Marine	4,050.7	1981
Siberut	National Park	Natural Park	-	1,905	1992
Sibolangit	Nature Recreation Park	NR	-	0.25	1980
Sibolangit	Nature Reserve	NR	-	0.9	1934
Sibolga	Nature Reserve	NR	-	201	
Sibual-Buali	Nature Reserve	NR	-	50	1982
Sicikeh Cikeh	Nature Recreation Park	NR	-	5.75	1989
Sidei-Wibain	Nature Reserve	Wilderness Area	Marine	9	
Sidrap	Nature Recreation Park	NR	-	5	1992
Sijaba Hutaginjang	Nature Recreation Park	NR	-		
Simeulue (Simeulue)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	483.8615	2006
Sindangkerta	Game Reserve	NR	Marine	0.9	

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Singkil Barat	Nature Reserve	NR	Marine	650	
Sinjai	Grand Forest Park	Protected Landscape/Seascape	Marine	7.2	2008
Siranggas	Wildlife Reserve	NR	-	56.57	1934
Situgunung	Nature Recreation Park	NR	-	1	1975
Sorong	Nature Recreation Park	Protected Landscape/Seascape	-	9.45	1990
Southeast Misool (Raja Ampat)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	3,328.6	2007
Sub Vak 18c and 19b	Nature Reserve	NR	-	0.07	1930
Sukawayang	Nature Reserve	Strict Nature Reserve	Marine	0.31	1919
Sukawayang	Nature Recreation Park	NR	-	0.16	1991
Sultan Adam	Grand Forest Park	Protected Area With Sustainable Use of Natural Resources	-	1120	1989
Sultan Sarif Hasyim	Grand Forest Park	NR	-	59.2	
Sultan Thaha Saifudin	Grand Forest Park	NR	-	158.3	
Sumba Strait Marine Area (Laut Sawu)	National Park	Natural Park	Marine	5,671.656	2009
Sumber Semen	Nature Recreation Park	Protected Landscape/Seascape	-	0.17	1975
Sungai Berambai	Nature Reserve	NR	-	1,100	
Sungai Camba	Research Forest	Habitat/ Species Management Area	-	13	
Sungai Kayan	National Park	NR	-	1,500	
Sungai Kayan Sungai Mentarang	National Park	Protected Area With Sustainable Use of Natural Resources	-	13,605	1980
Sungai Kolbu Iyang Pintean	Nature Reserve	Strict Nature Reserve	-	0.19	1919
Sungai Seram	Recreation Park	Wilderness Area	-	10	
Suranadi	Nature Recreation Park	NR	-	0.52	1976
Taba Pananjung	Nature Reserve	NR	-	0.01	1932
Tabora Selatan	Game Reserve	Protected Area With Sustainable Use of Natural Resources	-	300	1978
Take Bone Rate	National Park	Natural Park	Marine	5,307.65	2001
Takokak	Nature Reserve	NR	-	0.5	1919
Taman Laut Banda	Recreation Park	Protected Landscape/Seascape	Marine	24.37	2009
Tambora Utara GR (Sumbawa Is.)	Game Reserve	NR	-	800	
Tamrau Utara	Nature Reserve	NR	-	3,683.65	
Tanah Pedauh	Nature Recreation Park	NR	Marine	5.44	1975
Tangale	Nature Reserve	NR	-	1.13	1992
Tanggamus	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	156.6	1941
Tangkoko Batuangus	Nature Reserve	Strict Nature Reserve	Marine	31.96	1981
Tangkuban Perahu	Recreation Park	Strict Nature Reserve	-	3.7	1974
Tangkuban Perahu	Nature Recreation Park	Strict Nature Reserve	Marine	3.7	1978
Tangkuban Perahu (Pelabuhan Ratu)	Nature Reserve	NR	-	0.33	1930

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Tanjung Amelango	Game Reserve	Habitat/ Species Management Area	Marine	8.5	1975
Tanjung Api	Nature Reserve	Strict Nature Reserve	Marine	42.46	1977
Tanjung Batikolo	Game Reserve	Habitat/ Species Management Area	Marine	55	1980
Tanjung Datuk	Nature Reserve	NR	Marine	288	
Tanjung Keluang	Recreation Park	Protected Landscape/Seascape	Marine	20	1984
Tanjung Kerita Mese	Game Reserve	NR	Marine	150	
Tanjung Oisina Mangrove Swamp	Game Reserve	Habitat/ Species Management Area	Marine	5	1993
Tanjung Panjang	Nature Reserve	Strict Nature Reserve	Marine	30	1995
Tanjung Pasir	Recreation Park	NR	Marine	5	
Tanjung Penghujan NR/RP	Other Area	NR	Marine	400	
Tanjung Peropa	Game Reserve	Habitat/ Species Management Area	Marine	380	1986
Tanjung Pukuwatu	Game Reserve	NR	Marine	60	
Tanjung Puting	National Park	Natural Park	Marine	3,550	1939
Tanjung Putting	UNESCO-MAB Biosphere Reserve	NR	Marine	4,150.4	1977
Tanjung Sedari	Nature Reserve	NR	Marine	82	
Tanjung Watupayung	Game Reserve	NR	Marine	0.05	
Tapanuli Tengah (Tapanuli Tengah)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	843.0126	2007
Telaga Bodas	Nature Reserve	NR	-	2.63	1924
Telaga Bodas	National Park	NR	-	0.24	1978
Telaga Dringo	Nature Reserve	NR	-	0.26	1940
Telaga Patenggang	Nature Recreation Park	NR	-	0.65	1981
Telaga Patenggang	Nature Reserve	NR	-	1.5	1919
Telaga Ranjeng	Nature Reserve	Strict Nature Reserve	-	0.19	1924
Telaga Sumurup	Nature Reserve	NR	-	0.2	1940
Telaga Warna	Nature Reserve	Strict Nature Reserve	-	3.68	1954
Telaga Warna	Nature Recreation Park	NR	-	0.05	1981
Telaga Warno/Pengilon	Nature Recreation Park	NR	-	0.4	1978
Teluk Adang dan Teluk Apar	Nature Reserve	NR	Marine	1300	
Teluk Ambon	Marine Multiple Use Reserve	NR	Marine	500	
Teluk Ampar	Nature Reserve	NR	-	469	1993
Teluk Baron	Nature Reserve	Strict Nature Reserve	Marine	0.02	1937
Teluk Bintuni	Nature Reserve	NR	Marine	4,500	
Teluk Kelumpang/Selat Laut/Selat Sebuku	Nature Reserve	Strict Nature Reserve	Marine	666.5	1981
Teluk Kep. Kai Kecil	Other Area	NR	Marine	630	
Teluk Kupang	Recreation Park	Protected Landscape/Seascape	Marine	500	1993
Teluk Lasolo-Teluk Dalam	Nature Reserve	NR	Marine	818	
Teluk Lelintah	Wildlife Sanctuary	NR	Marine	25	
Teluk Lenggasana	Nature Reserve	NR	Marine	160	
Teluk Maumere	Recreation Park	Protected Landscape/Seascape	Marine	594.5	1986
Teluk Mayalibit (Raja Ampat)	Locally Managed Marine Area	Protected Area With Sustainable Use of Natural Resources	Marine	489.7683	2007
Teluk Pelikan	Nature Reserve	NR	Marine	0.1	

Name	Management Type	IUCN Category	Marine	Reported Area (km2)	Status Year
Teluk Yotefa	Nature Recreation Park	Protected Landscape/Seascape	Marine	16.5	1981
Terusan Dalam	Game Reserve	Habitat/ Species Management Area	-	747.5	1988
Tesso Nilo	National Park	NR	-	385.76	2004
The Leuser Ecosystem	Conservation Area	NR	-	27,000	1998
Tirosa Batek Marine Area (Laut Sawu)	National Park	Natural Park	Marine	29,454.51	2009
Tirta Rimba	Nature Recreation Park	NR	-	5	1978
Tretes	Nature Recreation Park	NR	-	0.1	1975
Tropical Rainforest Heritage of Sumatra	World Heritage Site	NR	-	25,951.25	2004
Tujuh Belas Pulau	Nature Reserve	Strict Nature Reserve	Marine	99	1987
Tuk Songo	Nature Recreation Park	Protected Landscape/Seascape	-	0.07	1975
Tuti Adagae	Nature Recreation Park	Protected Landscape/Seascape	-	50	1981
Ujung Kulon	National Park	Natural Park	Marine	1,229.56	1992
Ujung Kulon National Park	World Heritage Site	NR	Marine	1,230.51	1991
Ulo Lanang Kecubung	Nature Reserve	Strict Nature Reserve	-	0.71	1922
Upper Mamberano	Other Area	NR	-		
Vak 50 Comal	Nature Reserve	NR	-	0.24	1930
Waduk Gede/Jati Gede	Nature Reserve	NR	-	105	
Wae Bula	Nature Reserve	NR	Marine	600	
Waeapo	Nature Reserve	NR	Marine	30	
Wan Abdul Rachman	Grand Forest Park	NR	-	222.44	1992
Wasur	National Park	Natural Park	Marine	4,138.1	1990
Wasur National Park	Wetlands of International Importance (Ramsar)	NA	Marine	4,138.1	2006
Watangan Puger	Nature Reserve	Strict Nature Reserve	-	0.01	1919
Watu Ata	Nature Recreation Park	NR	-	48.99	1992
Watu Manggota	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	40	
Watu Panggota/Bondokapu	Game Reserve	NR	-	40	
Way Kambas	National Park	Natural Park	Marine	1,300	1989
Way Waya	Protection Forest	Protected Area With Sustainable Use of Natural Resources	-	85.13	1941
Way Wuul Mburak	Nature Recreation Park	Strict Nature Reserve	-	30	1985
Waya Bula	Game Reserve	NR	Marine	600	
Wewe-Koor	Nature Reserve	NR	Marine		
Wijaya Kusuma	Nature Reserve	Strict Nature Reserve	Marine	0.01	1937
Wolo Tado, Ngede Nalo Merah, Siung	Nature Recreation Park	NR	-	40.17	1992
Wondi Boy	Nature Reserve	Habitat/ Species Management Area	-	730.22	1992
Wondiwoi	Nature Reserve	Wilderness Area	-	795	
Yan Lapa	Nature Reserve	Strict Nature Reserve	-	0.32	1956
Yunghun	Nature Reserve	NR	-	0.03	1919

NR: Not Reported NA: Not Applicable

Source: Protected Planet, 2012, www.protectedplanet.net, accessed November 6, 2012.

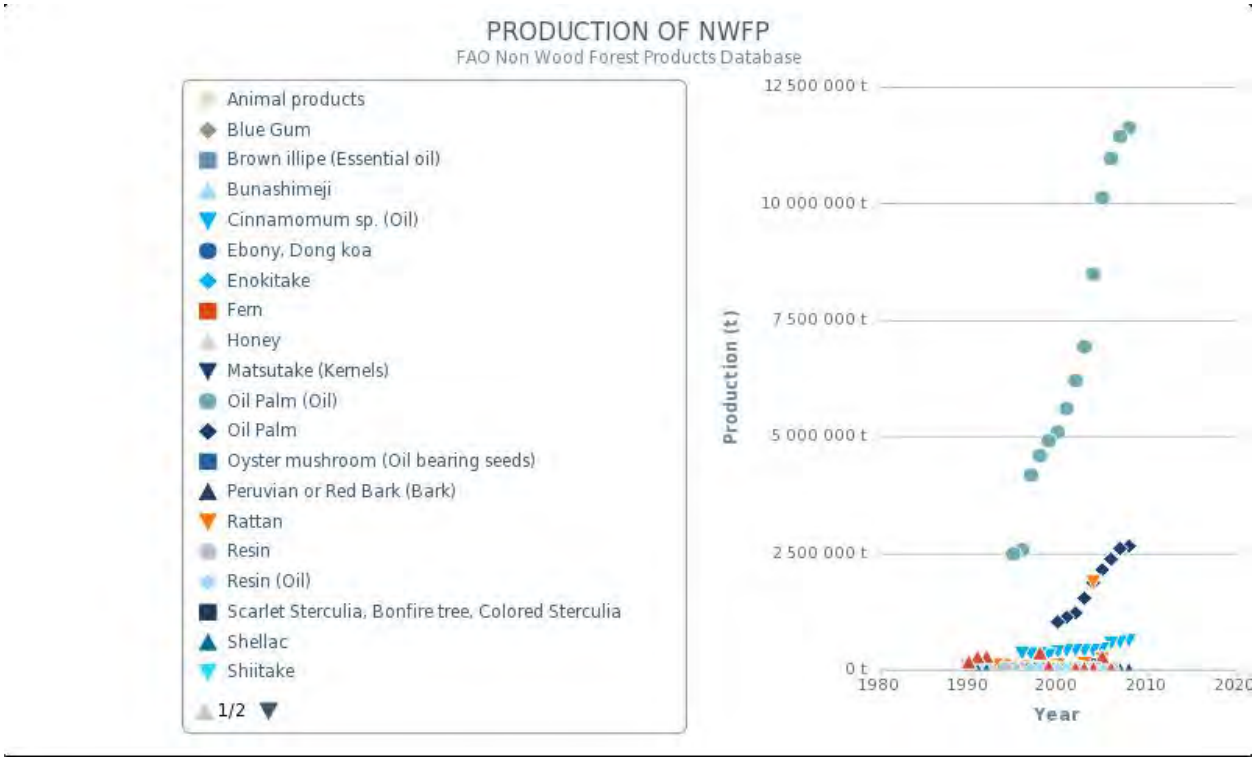
ANNEX E. TRENDS OF ECONOMIC GROWTH AND ITS IMPACT ON BIODIVERSITY

Table 1. Oil Palm Production (in Tons) and Harvested (in Ha) in Indonesia, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Production	7,405,328	8,452,759	10,341,227	12,258,713	13,324,903	14,031,184	14,270,399	18,000,000	19,500,000	117,584,513
Area Harvested*	1,481,066	1,690,552	2,068,245	2,451,743	2,664,981	2,806,237	2,854,080	3,600,000	3,900,000	23,516,903**

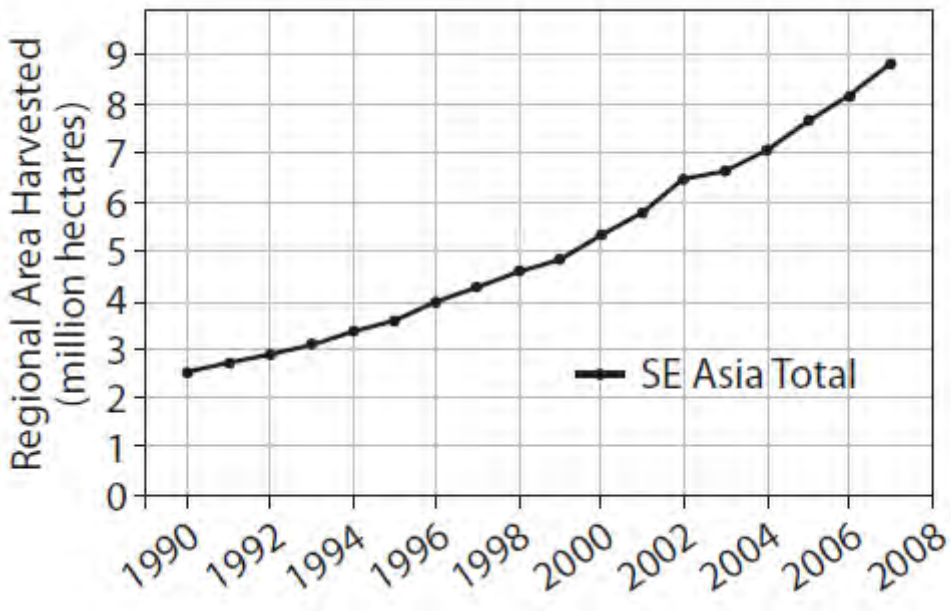
Source: Rapier, 2010. "The Palm Oil Conundrum"
*Using a formula that an acre of tropical forest produces 5 tons of oil palm on average

Table 2. Production of Non-wood Forest Products



Source: Sources: FAOSTAT (2012); FAO (2012)

Table 3. The Rapid Growth in Area Harvested for Palm Oil, 1990-2007



Sources: FAOSTAT (2012); Indonesia Master Plan 2011-2025; FAO (2012)

Table 4. Oil Palm Area (million hectares) and Production (million tons in Indonesia, 1970-2010

Year	Area			Production			Area Total	Production Total
	Smallholders	State-Owned	Private Estate	Smallholders	State-Owned	Private Estate		
1970		0.09	0.05		0.15	0.07	**0.13**	**0.22**
1980	0.01	0.2	0.09	0	0.5	0.22	**0.29**	**0.72**
1990	0.29	0.37	0.46	0.38	1.25	0.79	**1.13**	**2.41**
2000	1.17	0.59	2.4	1.91	1.46	3.63	**4.16**	**7**
2005	2.36	0.53	2.57	4.5	1.45	5.91	**5.45**	**11.86**
2010	3.31	0.62	3.89	7.77	2.09	9.98	**7.82**	**19.84**

Source: Ministry of Agriculture (2011); Obidzinski, Andriani, Komarudin, and Andrianto (2012)

Table 5. Deforestation and Oil Palm Expansion in Three Sites in Indonesia, 1970-2010 (hectares)

Parameter	West Papua	West Kalimantan	Papua
Net deforestation	6,056	7,100	21,804
Deforestation due to oil palm	4,049	4,949	20,794
Total oil palm expansion	4,857	5,266	20,999
% of oil palm expansion that occurs at the expense of forests	83%	94%	99%

Sources: Ministry of Agriculture (2011); Obidzinski, Andriani, Komarudin, and Andrianto (2012)

Table 6. Perceived Livelihood Impact of Oil Palm Plantations According to Former Landowners and Customary Users for Three Sites in Indonesia

Variable	West Papua			West Kalimantan			Papua		
	Negative	No Impact	Positive	Negative	No Impact	Positive	Negative	No Impact	Positive
Time to access forest products	**50%***	33%	17%	**86%***	14%	4%	**100%***	0%	0%
Ease of accessing land for swiddens	25%	44%	31%	**71%***	27%	10%	**67%***	33%	0%
Time taken to access swiddens	42%	28%	31%	9%	**78%***	13%	**67%***	33%	0%

*Percentages equal to or greater than 50%
Sources: Ministry of Agriculture (2011); Obidzinski, Andriani, Komarudin, and Andrianto (2012)

Table 7. Environmental Impact and Perceived Social and Economic Effects Associated with Oil Palm Expansion in Three Sites in Indonesia (% of respondents)

Parameter	West Papua	West Kalimantan	Papua
Decreased water quality	32%	**50%***	**58%***
Decreased water quantity	18%	**79%***	**50%***
Decreased forest cover	**69%***	**70%***	**53%***
Increase in crop pests	5%	22%	22%
Water pollution	43%	**70%***	**83%***
Air pollution	7%	28%	37%
Soil erosion	**53%***	5%	33%
Soil stabilization	15%	23%	8%
Increase in human disease	24%	27%	31%
Increased incidence of floods	**64%***	**87%***	**54%***

*Percentages equal to or greater than 50%
Sources: Ministry of Agriculture (2011); Obidzinski, Andriani, Komarudin, and Andrianto (2012)

Table 8. Fisheries Production (million tons) in Indonesia from 2006-2010

	2006	2007	2008	2009	2010
Catch	4.81	5.04	5.00	5.11	5.35
Aquaculture	2.68	3.19	3.86	4.71	5.48
Total	**7.49**	**8.24**	**8.86**	**9.82**	**10.83**

Source: Indonesia Master Plan 2011-2025

Table 9. Fisheries Production (in tons) in Indonesia

Fisheries Production	Year		Average Growth (%)
	2009	2010	
Catch Fisheries	**5,107,971**	**5,348,440**	**4.71**
Fisheries	4,812,235	4,846,880	0.72
Open water	295,736	501,560	69.60
Aquaculture	**4,708,563**	**5,478,062**	**16.34**
Marine Aquaculture	2,820,083	3,385,552	20.05
Fishpond	907,123	990,403	9.18
Pond	554,067	627,643	13.28
Karamba	101,771	117,860	15.81
Floating Net	238,606	272,705	14.29
Rice Field	86,913	83,900	-3.47
Total	**9,816,534**	**10,826,502**	**10.29**

Source: Indonesia Master Plan 2011-2025

Table 10. Net Losses to Society During a 20-year* Period from Overfishing, Blast Fishing, and Upland Activities in Indonesia (in million U.S. dollars)

	Benefits to Individuals		Losses to Society		Net Losses	
Activity	**Net Private Benefits from Activity**	**Foregone Sustainable Fishery Income**	**Loss of Coastal Protection**	**Loss of Tourism Revenues**	**Summary of Economic Losses of Reef Services**	**Net Loss to Society from Activity**
Blast Fishing	370	570	160	210	940	570
Overfishing	1,160	3,030	0	N.Q.	3,303	1,870
Sedimentation from Upland Activities	20	20	0	100	120	100

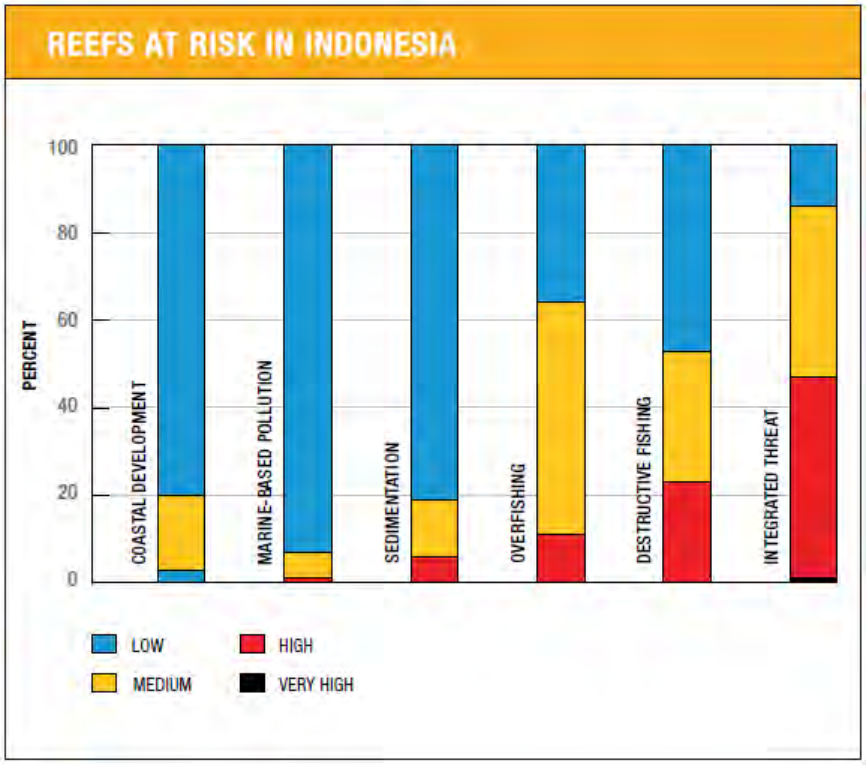
Source: "Economic Analysis of Indonesian Reefs"
*20-year period based on a 10 percent discount rate based on cross-tabulations of risk results and benefits/loss estimates

Table 11. Area and Percentage of Reefs at Risk for Indonesia (2002)

Reef Area (Km^2)	Reef Area as % of Total in Region	Reefs at Risk Threat Index								Percentage at Medium or Higher Threat risk
		Low		Medium		High		Very High		
		Km^2	Pct.	Km^2	Pct.	Km^2	Pct.	Km^2	Pct.	
50,875	51%	6,930	14%	19,809	39%	23,403	46%	733	1%	86%

Source: "Reefs at Risk in Southeast Asia," WRI, 2002.

Table 12. Reasons for Reef Threats in Indonesia by Threat Index



Source: WRI, 2008. Reefs at Risk in Southeast Asia.

Table 13. Area Harvest, Production, and Yield of Cocoa Beans and Coffee in Indonesia, 2000-2010

Product	Element	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cocoa Beans	Area Harvested (Ha)	749,917	765,405	776,901	961,107	1,090,960	1,167,050	905,730	923,968	1,425,220	1,587,140	1651,540
Coffee, Green	Area Harvested (Ha)	1,260,690	1,313,380	1,372,180	1,381,730	1,303,940	1,255,270	1,308,730	1,295,910	1,295,110	1,266,240	1,268,480
Cocoa Beans	Production (tonnes)	421,142	536,804	619,192	695,361	691,704	748,827	769,386	740,006	803,593	809,583	844,626
Coffee, Green	Production (tonnes)	554,574	569,234	682,019	663,571	647,385	640,365	682,158	676,475	698,016	682,591	684,076
Cocoa Beans	Yield (Kg/Ha)	5,616	7,013	7,970	7,235	6,340	6,416	8,495	8,009	5,638	5,101	5,114
Coffee, Green	Yield (Kg/Ha)	4,399	4,334	4,970	4,802	4,965	5,101	5,212	5,220	5,390	5,391	5,393

Source: FAOSTAT (2012)

ANNEX F. IUCN RED LIST

MAMMALS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Ailurops Melanotis*	Talaud Bear Cuscus	CR
2	*Bunomys Coelestis*	Heavenly Hill Rat	CR
3	*Dendrolagus Mayri*	Wondiwoi Tree-Kangaroo	CR
4	*Dicerorhinus Sumatrensis*	Sumatran Rhinoceros	CR
5	*Elephas Maximus*	Sumatran Elephant	CR
6	*Macaca Nigra*	Black Crested Macaque	CR
7	*Macaca Pagensis*	Pagai Island Macaque	CR
8	*Melomys Fraterculus*	Manusela Melomys	CR
9	*Panthera Tigris*	Sumatran Tiger	CR
10	*Pongo Abelii*	Sumatran Orangutan	CR
11	*Presbytis Chrysomelas*	Bornean Banded Langur	CR
12	*Presbytis Chrysomelas*	Tricolored Langur	CR
13	*Pteropus Aruensis*	Aru Flying Fox	CR
14	*Rhinoceros Sondaicus*	Javan Rhinoceros	CR
15	*Simias Concolor*	Pig-tailed Langur	CR
16	*Spilocuscus Rufoniger*	Black-Spotted Cuscus	CR
17	*Spilocuscus Wilsoni*	Biak Spotted Cuscus	CR
18	*Tarsius Tumpara*	Siau Island Tarsier	CR
19	*Uromys Boeadii*	Biak Giant Rat	CR
20	*Uromys Emmae*	Emma's Giant Rat	CR
21	*Zaglossus Attenboroughi*	Attenborough's Echidna	CR
22	*Zaglossus Bartoni*	Eastern Long-Beaked Echidna	CR
23	*Zaglossus Bruijnii*	Long-Beaked Echidna	CR
24	*Acerodon Humilis*	Talaud Acerodon	EN
25	*Bunomys Prolatus*	Long-Headed Hill Rat	EN
26	*Chiropodomys Karlkoopmani*	Pencil-tailed Tree Mouse	EN
27	*Cuon Alpinus*	Asiatic Wild Dog	EN
28	*Cynogale Bennettii*	Otter-Civet	EN
29	*Dendrolagus Goodfellowi*	Goodfellow's Tree Kangaroo	EN
30	*Dendrolagus Mbaiso*	Dingiso	EN
31	*Echiothrix Leucura*	Northern Sulawesi Echiothrix	EN
32	*Elephas Maximus*	Asian Elephant	EN
33	*Hipposideros Orbiculus*	Orbiculus Leaf-Nosed Bat	EN
34	*Hylobates Agilis*	Agile Gibbon	EN
35	*Hylobates Albibarbis*	Bornean Agile Gibbon	EN
36	*Hylobates Klossii*	Dwarf Gibbon	EN
37	*Hylobates Lar*	Common Gibbon	EN
38	*Hylobates Lar*	Sumatran Lar	EN
39	*Hylobates Moloch*	Javan Gibbon	EN

MAMMALS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
40	*Hylobates Muelleri*	Bornean Gibbon	EN
41	*Hylobates Muelleri*	Abbotts Gray Gibbon	EN
42	*Hylobates Muelleri*	Mullers Gray Gibbon	EN
43	*Hylopetes Sipora*	Sipora Flying Squirrel	EN
44	*Iomys Sipora*	Mentawi Flying Squirrel	EN
45	*Leopoldamys Siporanus*	Archipelago Leopoldamys	EN
46	*Macaca Maura*	Celebes Macaque	EN
47	*Mallomys Gunung*	Alpine Woolly Rat	EN
48	*Manis Javanica*	Malayan Pangolin,	EN
49	*Maxomys Pagensis*	Mentawai Archipelago Maxomys	EN
50	*Maxomys Wattsi*	Watts's Spiny Rat	EN
51	*Melomys Aerosus*	Dusky Mosaic-Tailed Rat	EN
52	*Melomys Bannisteri*	Great Kai Island Melomys	EN
53	*Melomys Caurinus*	Short-Tailed Talaud Melomys	EN
54	*Melomys Talaudium*	Long-Tailed Talaud Melomys	EN
55	*Nasalis Larvatus*	Long-Nosed Monkey	EN
56	*Neofelis Diardi*	Bornean Clouded Leopard	EN
57	*Neofelis Diardi*	Sumatran Clouded Leopard	EN
58	*Neopteryx Frosti*	Small-Toothed Fruit Bat	EN
59	*Nesoromys Ceramicus*	Ceram Rat	EN
60	*Nycticebus Javanicus*	Javan Slow Loris	EN
61	*Panthera Tigris*	Tiger	EN
62	*Paraleptomys Rufilatus*	Northern Hydromyine	EN
63	*Pardofelis Badia*	Bay Cat	EN
64	*Paulamys Naso*	Flores Long-Nosed Rat	EN
65	*Petinomys Lugens*	Siberut Flying Squirrel	EN
66	*Phalanger Alexandrae*	Gebe Cuscus	EN
67	*Pongo Pygmaeus*	Bornean Orangutan	EN
68	*Pongo Pygmaeus*	Northeast Bornean Orangutan	EN
69	*Pongo Pygmaeus*	Western Bornean Orangutan	EN
70	*Pongo Pygmaeus*	Southern Bornean Orangutan	EN
71	*Presbytis Comata*	Grizzled Leaf Monkey	EN
72	*Presbytis Hosei*	Millers Grizzled Langur	EN
73	*Presbytis Melalophos*	Mitred Leaf Monkey	EN
74	*Presbytis Melalophos*	Southern Mitered Langur	EN
75	*Presbytis Potenziani*	Long-Tailed Langur	EN
76	*Prionailurus Planiceps*	Flat-Headed Cat	EN
77	*Prionailurus Viverrinus*	Fishing Cat	EN
78	*Pteromyscus Pulverulentus*	Smoky Flying Squirrel	EN
79	*Pteropus Melanopogon*	Black-Hearded Flying Fox	EN
80	*Pteropus Pohlei*	Geelvink Bay Flying Fox	EN

MAMMALS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
81	*Rattus Hainaldi*	Hainalds Flores Island Rat	EN
82	*Rattus Lugens*	Mentawai Archipelago Rat	EN
83	*Rattus Simalurensis*	Simalur Archipelago Rat	EN
84	*Rhinolophus Madurensis*	Madura Horseshoe Bat	EN
85	*Rhynchomeles Prattorum*	Ceram Bandicoot	EN
86	*Suncus Mertensi*	Flores Shrew	EN
87	*Sundamys Maxi*	Bartels's Rat	EN
88	*Sundasciurus Fraterculus*	Fraternal Squirrel	EN
89	*Symphalangus Syndactylus*	Siamang	EN
90	*Tapirus Indicus*	Asian Tapir	EN
91	*Tarsius Bancanus*	Horsfield's Tarsier	EN
92	*Tarsius Pelengensis*	Peleng Island Tarsier	EN
93	*Tarsius Sangirensis*	Sagihe Island Tarsier	EN
94	*Tupaia Chrysogaster*	Golden-Bellied Treeshrew	EN
95	*Acerodon Mackloti*	Sunda Flying-Fox	VU
96	*Ailurops Ursinus*	Bear Cuscus	VU
97	*Aonyx Cinerea*	Asian Small-Clawed Otter	VU
98	*Arctictis Binturong*	Bearcat	VU
99	*Bunomys Fratrorum*	Fraternal Hill Rat	VU
100	*Callosciurus Melanogaster*	Mentawai Squirrel	VU
101	*Canis Lupus*	Dingo	VU
102	*Coelops Robinsoni*	Malayan Tailless Leaf-Nosed Bat	VU
103	*Crocidura Orientalis*	Oriental Shrew	VU
104	*Dendrolagus Inustus*	Grizzled Tree Kangaroo	VU
105	*Dendrolagus Stellarum*	Seris Tree Kangaroo	VU
106	*Dendrolagus Ursinus*	Black Tree Kangaroo	VU
107	*Dobsonia Emersa*	Biak Bare-Backed Fruit Bat	VU
108	*Dorcopsis Luctuosa*	Gray Dorcopsis	VU
109	*Dyacopterus Brooksi*	Brookss Dyak Fruit Bat	VU
110	*Echiothrix Centrosa*	Central Sulawesi Echiothrix	VU
111	*Eropeplus Canus*	Sulawesi Soft-furred Rat	VU
112	*Haeromys Minahassae*	Lowland Sulawesi Haeromys	VU
113	*Haeromys Pusillus*	Lesser Ranee Mouse	VU
114	*Harpyionycteris Celebensis*	Sulawesi Harpy Fruit Bat	VU
115	*Helarctos Malayanus*	Malayan Sun Bear	VU
116	*Hemigalus Derbyanus*	Banded Civet	VU
117	*Hipposideros Sorenseni*	Sorensen's Leaf-Nosed Bat	VU
118	*Hylomys Parvus*	Dwarf Gymnure	VU
119	*Hyosciurus Ileile*	Lowland Long-Nosed Squirrel	VU
120	*Kadarsanomys Sodyi*	Javan Bamboo Rat	VU
121	*Kerivoula Flora*	Flores Woolly Bat	VU

MAMMALS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
122	*Komodomys Rintjanus*	Komodo Rat	VU
123	*Lutrogale Perspicillata*	Indian Smooth-Coated Otter	VU
124	*Macaca Hecki*	Heck's Macaque	VU
125	*Macaca Nemestrina*	Pig-tailed Macaque	VU
126	*Macaca Nigrescens*	Dumoga-Bone Macaque	VU
127	*Macaca Ochreata*	Booted Macaque	VU
128	*Macaca Ochreata*	Muna-Buton Macaque	VU
129	*Macaca Ochreata*	Booted Macaque	VU
130	*Macaca Siberu*	Siberut Macaque	VU
131	*Macaca Tonkeana*	Tonkean Black Macaque	VU
132	*Macrogalidia Musschenbroekii*	Brown Palm Civet	VU
133	*Margaretamys Beccarii*	Beccari's Margareta Rat	VU
134	*Maxomys Inflatus*	Broad-Nosed Sumatran Maxomys	VU
135	*Maxomys Rajah*	Rajah Spiny Rat	VU
136	*Maxomys Whiteheadi*	Whitehead's Spiny Rat	VU
137	*Megaerops Kusnotoi*	Javan Tailless Fruit Bat	VU
138	*Megaerops Wetmorei*	Mindanao Fruit Bat	VU
139	*Murina Aenea*	Bronze Tube-Nosed Bat	VU
140	*Mus Vulcani*	Javan Shrew-Like Mouse	VU
141	*Neofelis Diardi*	Enkuli Clouded Leopard	VU
142	*Nesolagus Netscheri*	Sumatran Rabbit	VU
143	*Niviventer Cremoriventer*	Dark-Tailed Tree Rat	VU
144	*Nycteris Javanica*	Javan Slit-faced Bat	VU
145	*Nycticebus Coucang*	Greater Slow Loris	VU
146	*Nycticebus Menagensis*	Bornean Slow Loris	VU
147	*Nyctimene Keasti*	Keast's Tube-Nosed Fruit Bat	VU
148	*Nyctimene Minutus*	Lesser Tube-Nosed Bat	VU
149	*Pardofelis Marmorata*	Marbled Cat	VU
150	*Petinomys Genibarbis*	Whiskered Flying Squirrel	VU
151	*Petinomys Setosus*	Temminck's Flying Squirrel	VU
152	*Petinomys Vordermanni*	Vordermann's Flying Squirrel	VU
153	*Phalanger Matabiru*	Blue-Eyed Cuscus	VU
154	*Pithecheir Melanurus*	Javan Pithecheir	VU
155	*Presbytis Frontata*	White-faced Langur	VU
156	*Presbytis Hosei*	Gray Leaf Monkey	VU
157	*Presbytis Hosei*	Everetts Grizzled Langur	VU
158	*Presbytis Natunae*	Natuna Island Surili	VU
159	*Presbytis Thomasi*	North Sumatran Leaf Monkey	VU
160	*Pseudochirops Coronatus*	Reclusive Ringtail	VU
161	*Pseudochirulus Schlegeli*	Arfak Ringtail	VU
162	*Pteropus Melanotus*	Black-Eared Flying Fox	VU

MAMMALS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
163	*Pteropus Ocularis*	Ceram Fruit Bat	VU
164	*Pteropus Temminckii*	Temminck's Flying Fox	VU
165	*Rattus Hoogerwerfi*	Hoogerwerf's Rat	VU
166	*Rattus Mollicomulus*	Lampobatang Sulawesi Rat	VU
167	*Rattus Richardsoni*	Glacier Rat	VU
168	*Rattus Xanthurus*	Northeastern Xanthurus Rat	VU
169	*Rheithrosciurus Macrotis*	Tufted Ground Squirrel	VU
170	*Rhinolophus Canuti*	Canut's Horseshoe Bat	VU
171	*Rousettus Bidens*	Manado Fruit-Bat	VU
172	*Rousettus Spinalatus*	Bare-Backed Rousette	VU
173	*Rubrisciurus Rubriventer*	Sulawesi Giant Squirrel	VU
174	*Spilocuscus Papuensis*	Waigeo Cuscus	VU
175	*Strigocuscus Celebensis*	Little Celebes Cuscus	VU
176	*Syconycteris Carolinae*	Halmahera Blossom Bat	VU
177	*Syconycteris Hobbit*	Moss-forest Blossom Bat	VU
178	*Tadarida Johorensis*	Northern Free-tailed Bat	VU
179	*Tarsius Bancanus*	Horsfield's Tarsier	VU
180	*Tarsius Bancanus*	Bornean Tarsier	VU
181	*Tarsius Dentatus*	Diana Tarsier	VU
182	*Tarsius Tarsier*	Eastern Tarsier	VU
183	*Thylogale Browni*	New Guinea Pademelon	VU
184	*Thylogale Brunii*	Dusky Pademelon	VU
185	*Trachypithecus Auratus*	Ebony Leaf Monkey	VU

MARINE MAMMALS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Axis Kuhlii*	Bawean Deer	CR
2	*Balaenoptera Musculus*	Antarctic Blue Whale	CR
3	*Orcaella Brevirostris*	Irrawaddy Dolphin	CR
4	*Babyrousa Togeanensis*	Togian Islands Babirusa	EN
5	*Balaenoptera Musculus*	Blue Whale, Pygmy Blue Whale	EN
6	*Bos Javanicus*	Banteng, Tembadau	EN
7	*Bubalus Arnee*	Asian Buffalo	EN
8	*Bubalus Depressicornis*	Anoa, Lowland Anoa	EN
9	*Bubalus Quarlesi*	Mountain Anoa	EN
10	*Sus Verrucosus*	Javan Pig, Javan Warty Pig	EN
11	*Babyrousa Babyrussa*	Babiroussa	VU
12	*Babyrousa Celebensis*	Sulawesi Babirusa	VU
13	*Capricornis Sumatraensis*	Serow	VU
14	*Dugong Dugon*	Dugong, Sea Cow	VU

MARINE MAMMALS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
15	*Neophocaena Phocaenoides*	Indo-Pacific Finless Porpoise	VU
16	*Orcaella Brevirostris*	Irrawaddy Dolphin	VU
17	*Physeter Macrocephalus*	Cachelot	VU
18	*Rusa Timorensis*	Javan Deer	VU
19	*Rusa Unicolor*	Sambar	VU
20	*Sus Barbatus*	Bearded Pig	VU

BIRDS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Cacatua Sulphurea*	Lesser Sulphur-Crested Cockatoo	CR
2	*Carpococcyx Viridis*	Sumatran Ground-Cuckoo	CR
3	*Charmosyna Toxopei*	Blue-Fronted Lorikeet	CR
4	*Cissa Thalassina*	Javan Green Magpie	CR
5	*Colluricincla Sanghirensis*	Sangihe Shrikethrush	CR
6	*Columba Argentina*	Grey Wood-Pigeon	CR
7	*Corvus Unicolor*	Banggai Crow	CR
8	*Cyornis Ruckii*	Rueck's Blue-Flycatcher	CR
9	*Eutrichomyias Rowleyi*	Caerulean Paradise-Flycatcher	CR
10	*Fregata Andrewsi*	Andrews' Frigatebird	CR
11	*Leucopsar Rothschildi*	Bali Myna	CR
12	*Monarcha Boanensis*	Black-Chinned Monarch	CR
13	*Nisaetus Floris*	Flores Hawk-Eagle	CR
14	*Otus Siaoensis*	Siau Scops-Owl	CR
15	*Pseudibis Davisoni*	Black Ibis	CR
16	*Sterna Bernsteini*	Chinese Crested Tern	CR
17	*Sturnus Melanopterus*	Black-Winged Starling	CR
18	*Vanellus Macropterus*	Javanese Lapwing	CR
19	*Zosterops Nehrkorni*	Sangihe White-Eye	CR
20	*Aepypodius Bruijnii*	Bruijn's Brush-Turkey	EN
21	*Aethopyga Duyvenbodei*	Elegant Sunbird	EN
22	*Apalharpactes Reinwardtii*	Blue-Tailed Trogon	EN
23	*Cairina Scutulata*	White-Winged Duck	EN
24	*Ciconia Stormi*	Storm's Stork	EN
25	*Corvus Florensis*	Flores Crow	EN
26	*Cyornis Sanfordi*	Matinan Blue Flycatcher	EN
27	*Ducula Cineracea*	Timor Imperial-Pigeon	EN
28	*Eos Histrio*	Red-and-Blue Lory	EN
29	*Ficedula Bonthaina*	Lompobatang Flycatcher	EN
30	*Gallicolumba Hoedtii*	Wetar Ground-Dove	EN
31	*Gorsachius Goisagi*	Japanese Night-Heron	EN

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No	**Scientific Name**	**Common Name**	**Threat Category**
32	*Gymnocrex Talaudensis*	Talaud Rail	EN
33	*Heliopais Personatus*	Asian Finfoot	EN
34	*Loriculus Flosculus*	Flores Hanging-Parrot	EN
35	*Lorius Domicella*	Purple-Capped Lory	EN
36	*Macrocephalon Maleo*	Gray's Brush-Turkey	EN
37	*Madanga Ruficollis*	Buru Mountain White-Eye	EN
38	*Monarcha Brehmii*	Biak Monarch	EN
39	*Monarcha Everetti*	White-Tipped Monarch	EN
40	*Monarcha Sacerdotum*	Flores Monarch	EN
41	*Nisaetus Bartelsi*	Javan Hawk-Eagle	EN
42	*Otus Alfredi*	Flores Scops-Owl	EN
43	*Otus Beccarii*	Biak Scops-Owl	EN
44	*Papasula Abbotti*	Abbott's Booby	EN
45	*Pavo Muticus*	Green-Necked Peafowl	EN
46	*Polyplectron Schleiermacheri*	Bornean Peacock-Pheasant	EN
47	*Pterodroma Baraui*	Barau's Petrel	EN
48	*Scolopax Rochussenii*	Moluccan Woodcock	EN
49	*Tanysiptera Ellioti*	Kofiau Paradise-Kingfisher	EN
50	*Treron Psittaceus*	Timor Green-Pigeon	EN
51	*Tringa Guttifer*	Nordmann's Greenshank	EN
52	*Tyto Nigrobrunnea*	Sula Barn-Owl	EN
53	*Aceros Cassidix*	Knobbed Hornbill	VU
54	*Aceros Everetti*	Sumba Hornbill	VU
55	*Alcedo Euryzona*	Blue-Banded Kingfisher	VU
56	*Amaurornis Magnirostris*	Talaud Bush-Hen	VU
57	*Aquila Clanga*	Greater Spotted Eagle	VU
58	*Aramidopsis Plateni*	Platen's Rail, Snoring Rail	VU
59	*Arborophila Orientalis*	Grey-Breasted Partridge	VU
60	*Cacatua Alba*	Umbrella Cockatoo	VU
61	*Cacatua Moluccensis*	Moluccan Cockatoo	VU
62	*Calidris Tenuirostris*	Great Knot	VU
63	*Caprimulgus Concretus*	Bonaparte's Nightjar	VU
64	*Casuarius Casuarius*	Southern Cassowary	VU
65	*Casuarius Unappendiculatus*	Northern Cassowary	VU
66	*Centropus Nigrorufus*	Javan Coucal, Sunda Coucal	VU
67	*Centropus Rectunguis*	Short-Toed Coucal	VU
68	*Cochoa Azurea*	Javan Cochoa	VU
69	*Cochoa Beccarii*	Sumatran Cochoa	VU
70	*Cyornis Caerulatus*	Large-Billed Blue-Flycatcher	VU
71	*Ducula Pickeringii*	Grey Imperial-Pigeon	VU
72	*Egretta Eulophotes*	Chinese Egret	VU

BIRDS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
73	*Eos Cyanogenia*	Biak Red Lory	VU
74	*Epimachus Fastuosus*	Black Sicklebill	VU
75	*Eulipoa Wallacei*	Moluccan Megapode	VU
76	*Eurostopodus Diabolicus*	Satanic Eared-Nightjar	VU
77	*Garrulax Bicolor*	Sumatran Laughingthrush	VU
78	*Goura Cristata*	Blue Crowned-Pigeon	VU
79	*Goura Scheepmakeri*	Maroon-Breasted Crowned-Pigeon	VU
80	*Goura Victoria*	Victoria Crowned-Pigeon	VU
81	*Gymnocrex Rosenbergii*	Bald-Faced Rail, Blue-Faced Rail	VU
82	*Habroptila Wallacii*	Invisible Rail, Wallace's Rail	VU
83	*Harpyopsis Novaeguineae*	New Guinea Eagle, Papuan Eagle	VU
84	*Leptoptilos Javanicus*	Lesser Adjutant	VU
85	*Lonchura Vana*	Grey-Banded Munia	VU
86	*Lophura Bulweri*	Bulwer's Pheasant	VU
87	*Lophura Erythrophthalma*	Crestless Fireback	VU
88	*Lophura Hoogerwerfi*	Aceh Pheasant	VU
89	*Lophura Inornata*	Salvadori's Pheasant	VU
90	*Lorius Garrulus*	Chattering Lory	VU
91	*Macgregoria Pulchra*	Macgregor's Bird-of-Paradise	VU
92	*Megalurus Albolimbatus*	Fly River Grassbird	VU
93	*Megapodius Bernsteinii*	Sula Megapode, Sula Scrubfowl	VU
94	*Megapodius Geelvinkianus*	Biak Megapode	VU
95	*Melanoperdix Niger*	Black Partridge	VU
96	*Monarcha Julianae*	BlackBacked Monarch	VU
97	*Mulleripicus Pulverulentus*	Great Slaty Woodpecker	VU
98	*Mycteria Cinerea*	Milky Stork	VU
99	*Ninox Ios*	Cinnabar Boobook	VU
100	*Nisaetus Nanus*	Wallace's Hawk-Eagle	VU
101	*Numenius Madagascariensis*	Eastern Curlew	VU
102	*Numenius Tahitiensis*	Bristle-Thighed Curlew	VU
103	*Otus Angelinae*	Javan Scops-Owl, Javan Scops Owl	VU
104	*Padda Oryzivora*	Java Sparrow	VU
105	*Penelopides Exarhatus*	Sulawesi Hornbill	VU
106	*Philemon Fuscicapillus*	Dusky Friarbird, Morotai Friarbird	VU
107	*Pitta Baudii*	Blue-Headed Pitta	VU
108	*Pitta Nympha*	Fairy Pitta	VU
109	*Pitta Schneideri*	Schneider's Pitta	VU
110	*Pitta Venusta*	Black-Crowned Pitta	VU
111	*Psittaculirostris Salvadorii*	Salvadori's Fig-Parrot	VU
112	*Psittrichas Fulgidus*	Pesquet's Parrot	VU
113	*Pterodroma Sandwichensis*	Hawaiian Petrel	VU

BIRDS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
114	*Ptilinopus Dohertyi*	Red-Naped Fruit-Dove	VU
115	*Ptilinopus Granulifrons*	Carunculated Fruit-Dove	VU
116	*Ptilocichla Leucogrammica*	Bornean Wren-babbler	VU
117	*Pycnonotus Zeylanicus*	Straw-Crowned Bulbul	VU
118	*Salvadorina Waigiuensis*	Salvadori's Teal	VU
119	*Setornis Criniger*	Hook-Billed Bulbul	VU
120	*Spilornis Kinabaluensis*	Kinabalu Serpent-Eagle	VU
121	*Tanygnathus Gramineus*	Black-Lored Parrot	VU
122	*Todiramphus Funebris*	Sombre Kingfisher	VU
123	*Treron Capellei*	Large Green-Pigeon	VU
124	*Treron Floris*	Flores Green-Pigeon	VU
125	*Turnix Everetti*	Sumba Buttonquail	VU
126	*Tyto Inexspectata*	Minahassa Barn-Owl	VU

AMPHIBIANS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Duttaphrynus Sumatranus*		CR
2	*Leptophryne Cruentata*	Bleeding Toad, Fire Toad	CR
3	*Philautus Jacobsoni*		CR
4	*Ansonia Latidisca*		EN
5	*Barbourula Kalimantanensis*	Bornean Flat-Headed Frog	EN
6	*Callulops Kopsteini*		EN
7	*Ingerophrynus Claviger*		EN
8	*Limnonectes Arathooni*		EN
9	*Limnonectes Microtympanum*		EN
10	*Oreophryne Monticola*		EN
11	*Philautus Similis*		EN
12	*Rhacophorus Angulirostris*		EN
13	*Huia Masonii*	Javan Torrent Frog	VU
14	*Kalophrynus Intermedius*		VU
15	*Kalophrynus Minusculus*		VU
16	*Kalophrynus Punctatus*		VU
17	*Leptobrachella Baluensis*		VU
18	*Leptobrachella Serasanae*		VU
19	*Leptolalax Hamidi*		VU
20	*Leptolalax Pictus*		VU
21	*Limnonectes Heinrichi*		VU
22	*Limnonectes Macrodon*	Fanged River Frog	VU
23	*Litoria Quadrilineata*		VU
24	*Litoria Rueppelli*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
25	*Litoria Wisselensis*		VU
26	*Meristogenys Amoropalamus*		VU
27	*Nyctixalus Margaritifer*		VU
28	*Oreophryne Celebensis*		VU
29	*Oreophryne Variabilis*		VU
30	*Pelophryne Guentheri*		VU
31	*Philautus Pallidipes*		VU
32	*Rhacophorus Fasciatus*		VU

ANTHAZOANS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Acropora Rudis*		EN
2	*Acropora Suharsonoi*		EN
3	*Alveopora Excelsa*		EN
4	*Alveopora Minuta*		EN
5	*Anacropora Spinosa*		EN
6	*Cantharellus Noumeae*		EN
7	*Hydnophora Bonsai*		EN
8	*Isopora Togianensis*		EN
9	*Lithophyllon Ranjithi*		EN
10	*Lobophyllia Serratus*		EN
11	*Montipora Setosa*		EN
12	*Pectinia Maxima*		EN
13	*Porites Eridani*		EN
14	*Porites Ornata*		EN
15	*Acanthastrea Bowerbanki*		VU
16	*Acanthastrea Brevis*		VU
17	*Acanthastrea Faviaformis*		VU
18	*Acanthastrea Hemprichii*		VU
19	*Acanthastrea Ishigakiensis*		VU
20	*Acanthastrea Regularis*		VU
21	*Acropora Abrolhosensis*		VU
22	*Acropora Aculeus*		VU
23	*Acropora Acuminata*		VU
24	*Acropora Anthocercis*		VU
25	*Acropora Aspera*		VU
26	*Acropora Awi*		VU
27	*Acropora Batunai*		VU
28	*Acropora Caroliniana*		VU
29	*Acropora Dendrum*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
30	*Acropora Derawanensis*		VU
31	*Acropora Desalwii*		VU
32	*Acropora Donei*		VU
33	*Acropora Echinata*		VU
34	*Acropora Elegans*		VU
35	*Acropora Globiceps*		VU
36	*Acropora Hemprichii*		VU
37	*Acropora Hoeksemai*		VU
38	*Acropora Horrida*		VU
39	*Acropora Indonesia*		VU
40	*Acropora Jacquelineae*		VU
41	*Acropora Kimbeensis*		VU
42	*Acropora Kirstyae*		VU
43	*Acropora Kosurini*		VU
44	*Acropora Listeri*		VU
45	*Acropora Loisetteae*		VU
46	*Acropora Lokani*		VU
47	*Acropora Lovelli*		VU
48	*Acropora Microclados*		VU
49	*Acropora Multiacuta*		VU
50	*Acropora Palmerae*		VU
51	*Acropora Paniculata*		VU
52	*Acropora Papillare*		VU
53	*Acropora Plumosa*		VU
54	*Acropora Polystoma*		VU
55	*Acropora Retusa*		VU
56	*Acropora Russelli*		VU
57	*Acropora Simplex*		VU
58	*Acropora Solitaryensis*		VU
59	*Acropora Speciosa*		VU
60	*Acropora Spicifera*		VU
61	*Acropora Striata*		VU
62	*Acropora Tenella*		VU
63	*Acropora Turaki*		VU
64	*Acropora Vaughani*		VU
65	*Acropora Verweyi*		VU
66	*Acropora Walindii*		VU
67	*Acropora Willisae*		VU
68	*Alveopora Allingi*		VU
69	*Alveopora Daedalea*		VU
70	*Alveopora Fenestrata*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
71	*Alveopora Gigas*		VU
72	*Alveopora Marionensis*		VU
73	*Alveopora Verrilliana*		VU
74	*Anacropora Matthai*		VU
75	*Anacropora Puertogalerae*		VU
76	*Anacropora Reticulata*		VU
77	*Astreopora Cucullata*		VU
78	*Astreopora Incrustans*		VU
79	*Astreopora Moretonensis*		VU
80	*Australogyra Zelli*		VU
81	*Barabattoia Laddi*		VU
82	*Catalaphyllia Jardinei*		VU
83	*Caulastrea Curvata*		VU
84	*Caulastrea Echinulata*		VU
85	*Cyphastrea Agassizi*		VU
86	*Cyphastrea Ocellina*		VU
87	*Echinophyllia Costata*		VU
88	*Echinopora Ashmorensis*		VU
89	*Euphyllia Ancora*		VU
90	*Euphyllia Cristata*		VU
91	*Euphyllia Paraancora*		VU
92	*Euphyllia Paradivisa*		VU
93	*Euphyllia Paraglabrescens*		VU
94	*Favia Rosaria*		VU
95	*Favites Spinosa*		VU
96	*Fungia Curvata*		VU
97	*Fungia Taiwanensis*		VU
98	*Galaxea Acrhelia*		VU
99	*Galaxea Astreata*		VU
100	*Galaxea Cryptoramosa*		VU
101	*Goniastrea Deformis*		VU
102	*Goniastrea Ramosa*		VU
103	*Goniopora Albiconus*		VU
104	*Goniopora Burgosi*		VU
105	*Goniopora Planulata*		VU
106	*Goniopora Polyformis*		VU
107	*Halomitra Clavator*		VU
108	*Heliofungia Actiniformis*		VU
109	*Heliopora Coerulea*	Blue Coral	VU
110	*Isopora Brueggemanni*		VU
111	*Isopora Crateriformis*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
112	*Isopora Cuneata*		VU
113	*Leptastrea Aequalis*		VU
114	*Leptoria Irregularis*		VU
115	*Leptoseris Incrustans*		VU
116	*Leptoseris Yabei*		VU
117	*Lobophyllia Dentatus*		VU
118	*Lobophyllia Diminuta*		VU
119	*Lobophyllia Flabelliformis*		VU
120	*Montastrea Multipunctata*		VU
121	*Montastrea Salebrosa*		VU
122	*Montipora Altasepta*		VU
123	*Montipora Angulata*		VU
124	*Montipora Australiensis*		VU
125	*Montipora Cactus*		VU
126	*Montipora Calcarea*		VU
127	*Montipora Caliculata*		VU
128	*Montipora Capricornis*		VU
129	*Montipora Cebuensis*		VU
130	*Montipora Cocosensis*		VU
131	*Montipora Corbettensis*		VU
132	*Montipora Crassituberculata*		VU
133	*Montipora Delicatula*		VU
134	*Montipora Florida*		VU
135	*Montipora Friabilis*		VU
136	*Montipora Gaimardi*		VU
137	*Montipora Hodgsoni*		VU
138	*Montipora Mactanensis*		VU
139	*Montipora Malampaya*		VU
140	*Montipora Meandrina*		VU
141	*Montipora Orientalis*		VU
142	*Montipora Samarensis*		VU
143	*Montipora Turtlensis*		VU
144	*Montipora Verruculosus*		VU
145	*Montipora Vietnamensis*		VU
146	*Moseleya Latistellata*		VU
147	*Mycedium Steeni*		VU
148	*Nemenzophyllia Turbida*		VU
149	*Pachyseris Involuta*		VU
150	*Pachyseris Rugosa*		VU
151	*Pavona Bipartita*		VU
152	*Pavona Cactus*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
153	*Pavona Danai*		VU
154	*Pavona Decussata*	Cactus Coral	VU
155	*Pavona Venosa*		VU
156	*Pectinia Alcicornis*		VU
157	*Pectinia Lactuca*	Lettuce Coral	VU
158	*Physogyra Lichtensteini*		VU
159	*Platygyra Yaeyamaensis*		VU
160	*Plerogyra Discus*		VU
161	*Pocillopora Ankeli*		VU
162	*Pocillopora Danae*		VU
163	*Pocillopora Elegans*		VU
164	*Porites Aranetai*		VU
165	*Porites Attenuata*		VU
166	*Porites Cocosensis*		VU
167	*Porites Cumulatus*		VU
168	*Porites Horizontalata*		VU
169	*Porites Napopora*		VU
170	*Porites Nigrescens*		VU
171	*Porites Rugosa*		VU
172	*Porites Sillimaniana*		VU
173	*Porites Tuberculosa*		VU
174	*Psammocora Stellata*		VU
175	*Seriatopora Aculeata*		VU
176	*Seriatopora Dendritica*		VU
177	*Stylocoeniella Cocosensis*		VU
178	*Symphyllia Hassi*		VU
179	*Turbinaria Bifrons*		VU
180	*Turbinaria Heronensis*		VU
181	*Turbinaria Mesenterina*		VU
182	*Turbinaria Patula*		VU
183	*Turbinaria Peltata*		VU
184	*Turbinaria Reniformis*		VU
185	*Turbinaria Stellulata*		VU

BIVALVES CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Corbicula Possoensis*		EN
2	*Tridacna Derasa*	Southern Giant Clam	VU
3	*Tridacna Gigas*	Giant Clam	VU

CRUSTACIANS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Cherax Pallidus*		EN
2	*Irmengardia Nemestrinus*		EN
3	*Migmathelphusa Olivacea*		EN
4	*Parathelphusa Batamensis*		EN
5	*Adeleana Forcarti*		VU
6	*Arachnothelphusa Melanippe*		VU
7	*Malayopotamon Granulatum*		VU
8	*Nautilothelphusa Zimmeri*		VU
9	*Neodiaptomus Lymphatus*		VU
10	*Parathelphusa Crocea*		VU
11	*Parathelphusa Maindroni*		VU
12	*Parathelphusa Pantherina*		VU
13	*Parathelphusa Possoensis*		VU
14	*Sundathelphusa Minahassae*		VU
15	*Sundathelphusa Rubra*		VU

FISH CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Adrianichthys Kruyti*	Duck-Billed Buntingi	CR
2	*Anoxypristis Cuspidata*	Knifetooth Sawfish	CR
3	*Betta Miniopinna*		CR
4	*Betta Spilotogena*		CR
5	*Carcharhinus Hemiodon*	Pondicherry Shark	CR
6	*Chilatherina Sentaniensis*	Sentani Rainbowfish	CR
7	*Encheloclarias Kelioides*		CR
8	*Latimeria Chalumnae*	Coelacanth, Gombessa	CR
9	*Pandaka Pygmaea*	Dwarf Pygmy Goby	CR
10	*Pristis Zijsron*	Narrowsnout Sawfish	CR
11	*Thunnus Maccoyii*	Southern Bluefin Tuna	CR
12	*Urolophus Javanicus*	Java Stingaree	CR
13	*Weberogobius Amadi*	Poso Bungu	CR
14	*Xenopoecilus Poptae*	Popta's Buntingi	CR
15	*Aetobatus Flagellum*	Longheaded Eagle Ray	EN
16	*Aetomylaeus Maculatus*	Mottled Eagle Ray	EN
17	*Aetomylaeus Vespertilio*	Ornate Eagle Ray	EN
18	*Balantiocheilos Melanopterus*	Silver Shark	EN
19	*Carcharhinus Borneensis*	Borneo Shark	EN
20	*Cheilinus Undulatus*	Giant Wrasse, Humphead	EN
21	*Himantura Oxyrhyncha*	Longnose Marbled Stingray	EN
22	*Himantura Polylepis*		EN

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No	**Scientific Name**	**Common Name**	**Threat Category**
23	*Himantura Signifer*	White-Edge Freshwater Whipray	EN
24	*Lamiopsis Temmincki*	Broadfin Shark	EN
25	*Melanotaenia Boesemani*	Boeseman's Rainbowfish	EN
26	*Negaprion Acutidens*	Sharptooth Lemon Shark	EN
27	*Nomorhamphus Towoetii*		EN
28	*Oryzias Orthognathus*	Buntingi, Sharp-Jawed Buntingi	EN
29	*Pangasianodon Hypophthalmus*	Striped Catfish	EN
30	*Pastinachus Solocirostris*	Roughnose Stingray	EN
31	*Pterapogon Kauderni*	Banggai Cardinalfish	EN
32	*Sphyrna Lewini*	Scalloped Hammerhead	EN
33	*Sphyrna Mokarran*	Great Hammerhead	EN
34	*Xenopoecilus Oophorus*	Egg-Carrying Buntingi	EN
35	*Xenopoecilus Sarasinorum*		EN
36	*Acantopsis Octoactinotos*	Long-Faced Loach	VU
37	*Acrochordonichthys Chamaeleon*		VU
38	*Aetomylaeus Nichofii*	Banded Eagle Ray	VU
39	*Albula Glossodonta*	Shortjaw Bonefish	VU
40	*Alopias Pelagicus*	Pelagic Thresher, Thresher Shark	VU
41	*Alopias Vulpinus*	Common Thresher Shark	VU
42	*Atelomycterus Baliensis*	Bali Catshark	VU
43	*Atherinomorus Lineatus*	Lined Silverside	VU
44	*Betta Burdigala*		VU
45	*Betta Chloropharynx*		VU
46	*Betta Pinguis*		VU
47	*Bolbometopon Muricatum*	Bumphead Parrotfish	VU
48	*Carcharhinus Longimanus*	Oceanic Whitetip Shark	VU
49	*Carcharhinus Plumbeus*	Sandbar Shark	VU
50	*Centrophorus Squamosus*	Deepwater Spiny Dogfish	VU
51	*Chaenogaleus Macrostoma*	Hooktooth Shark	VU
52	*Chendol Lubricus*		VU
53	*Chilatherina Alleni*	Allen's Rainbowfish	VU
54	*Chilatherina Bleheri*	Bleher's Rainbowfish	VU
55	*Cromileptes Altivelis*	Baramundi Cod, Barramundi Cod	VU
56	*Dasyatis Fluviorum*	Brown Stingray, Estuary Stingaree	VU
57	*Dermogenys Weberi*		VU
58	*Encheloclarias Tapeinopterus*		VU
59	*Epinephelus Lanceolatus*	Brindle Bass, Brindled Grouper	VU
60	*Glaucostegus Granulatus*	Sharpnose Guitarfish	VU
61	*Glaucostegus Thouin*	Clubnose Guitarfish	VU
62	*Glaucostegus Typus*	Common Shovelnose Ray	VU
63	*Glossogobius Flavipinnis*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
64	*Glossogobius Intermedius*		VU
65	*Glossogobius Matanensis*		VU
66	*Glossolepis Incisus*	Red Rainbowfish	VU
67	*Gymnura Zonura*	Zonetail Butterfly Ray	VU
68	*Hemigaleus Microstoma*	Sickelfin Weasel Shark	VU
69	*Hemipristis Elongata*	Fossil Shark, Snaggletooth Shark	VU
70	*Himantura Hortlei*	Hortle's Whipray	VU
71	*Himantura Leoparda*	Leopard Whipray	VU
72	*Himantura Lobistoma*	Tubemouth Whipray	VU
73	*Himantura Pastinacoides*	Round Whipray	VU
74	*Himantura Uarnacoides*	Bleeker's Whipray	VU
75	*Himantura Uarnak*	Honeycomb Stingray	VU
76	*Himantura Undulata*	Bleeker's Variegated Whipray	VU
77	*Hippocampus Barbouri*	Barbour's Seahorse	VU
78	*Hippocampus Comes*	Tiger Tail Seahorse	VU
79	*Hippocampus Histrix*	Spiny Seahorse, Thorny Seahorse	VU
80	*Hippocampus Kelloggi*	Great Seahorse	VU
81	*Hippocampus Kuda*	Common Seahorse	VU
82	*Hippocampus Spinosissimus*	Hedgehog Seahorse	VU
83	*Hippocampus Trimaculatus*	Flat-faced Seahorse	VU
84	*Isurus Oxyrinchus*	Shortfin Mako	VU
85	*Isurus Oxyrinchus*	Shortfin Mako	VU
86	*Latimeria Menadoensis*	Sulawesi Coelacanth	VU
87	*Lentipes Whittenorum*		VU
88	*Makaira Nigricans*	Blue Marlin	VU
89	*Manta Alfredi*	Coastal Manta Ray	VU
90	*Manta Birostris*	Chevron Manta Ray	VU
91	*Melanotaenia Arfakensis*	Arfak Rainbowfish	VU
92	*Melanotaenia Parva*	Lake Kurumoi Rainbowfish	VU
93	*Mugilogobius Adeia*		VU
94	*Mugilogobius Latifrons*		VU
95	*Nebrius Ferrugineus*	Tawny Nurse Shark	VU
96	*Negaprion Acutidens*	Sharptooth Lemon Shark	VU
97	*Nemipterus Virgatus*	Golden Thread	VU
98	*Neolissochilus Theinemanni*		VU
99	*Oryzias Celebensis*		VU
100	*Oryzias Marmoratus*		VU
101	*Oryzias Matanensis*		VU
102	*Oryzias Nigrimas*	Black Buntingi	VU
103	*Oryzias Profundicola*		VU
104	*Paratherina Cyanea*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
105	*Paratherina Labiosa*		VU
106	*Paratherina Striata*		VU
107	*Paratherina Wolterecki*		VU
108	*Pegasus Volitans*		VU
109	*Plectropomus Areolatus*	Polkadot Cod, Spotted Coral Trout	VU
110	*Plectropomus Laevis*	Blacksaddled Coral Grouper	VU
111	*Poropuntius Tawarensis*		VU
112	*Pseudomugil Pellucidus*	Transparent Blue-Eye	VU
113	*Pseudomystus Myersi*		VU
114	*Rasbora Baliensis*		VU
115	*Rasbora Ennealepis*		VU
116	*Rasbora Tawarensis*		VU
117	*Rhina Ancylostoma*	Bowmouth Guitarfish, Mud Skate	VU
118	*Rhincodon Typus*	Whale Shark	VU
119	*Rhinobatos Jimbaranensis*		VU
120	*Rhinobatos Obtusus*	Widenose Guitarfish	VU
121	*Rhinobatos Penggali*		VU
122	*Rhinoptera Javanica*	Flapnose Ray	VU
123	*Rhynchobatus Australiae*	White-Spotted Guitarfish	VU
124	*Rhynchobatus Sp. Nov. A*	Roughnose Wedgefish	VU
125	*Rhynchobatus Springeri*	Broadnose Wedgefish	VU
126	*Sphaerichthys Vaillanti*		VU
127	*Squalus Montalbani*	Philippines Spurdog	VU
128	*Stegostoma Fasciatum*	Leopard Shark, Zebra Shark	VU
129	*Stupidogobius Flavipinnis*		VU
130	*Sundoreonectes Sabanus*		VU
131	*Taeniurops Meyeni*	Black-Blotched Stingray	VU
132	*Tamanka Sarasinorum*	Sarasin's Goby	VU
133	*Telmatherina Abendanoni*		VU
134	*Telmatherina Antoniae*		VU
135	*Telmatherina Celebensis*		VU
136	*Telmatherina Ladigesi*	Celebes Rainbow	VU
137	*Telmatherina Obscura*		VU
138	*Telmatherina Opudi*		VU
139	*Telmatherina Prognatha*		VU
140	*Telmatherina Sarasinorum*		VU
141	*Telmatherina Wahjui*		VU
142	*Thunnus Obesus*	Bigeye Tuna	VU
143	*Tominanga Aurea*		VU
144	*Tominanga Sanguicauda*		VU
145	*Tondanichthys Kottelati*		VU

FISH CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
146	*Urogymnus Asperrimus*	Porcupine Ray	VU
147	*Varia Jamoerensis*	Yamur Lake Grunter	VU

GASTROPODS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Tylomelania Kruimeli*		CR
2	*Brotia Pageli*		EN
3	*Miratesta Celebensis*		VU

HYDROZOANS CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Millepora Boschmai*		CR
2	*Millepora Foveolata*		VU
3	*Millepora Latifolia*		VU

CROCODILES CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Crocodylus Siamensis*	Siamese Crocodile	CR
2	*Tomistoma Schlegelii*	False Gharial, Malayan Gharial	EN

SNAKES CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Gehyra Barea*	Banda Island Dtella	EN
2	*Typhlops Schmutzi*	Schmutz's Worm Snake	EN
3	*Oligodon Pulcherrimus*		VU
4	*Ophiophagus Hannah*	Hamadryad, King Cobra	VU
5	*Python Bivittatus*	Burmese Python	VU
6	*Tetralepis Fruhstorferi*	Fruhstorfer's Mountain Snake	VU
7	*Varanus Komodoensis*	Komodo Dragon	VU

TURTLE AND TORTOISE CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Batagur Baska*	Batagur, Common Batagur	CR
2	*Batagur Borneoensis*	Painted Batagur, Painted Terrapin	CR
3	*Chelodina Mccordi*	Roti Island Snake-Necked Turtle	CR
4	*Dermochelys Coriacea*	Leatherback, Leathery Turtle	CR
5	*Eretmochelys Imbricata*	Hawksbill Turtle	CR

TURTLE AND TORTOISE CR = critically endangered EN = endangered VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
6	*Leucocephalon Yuwonoi*	Sulawesi Forest Turtle	CR
7	*Caretta Caretta*	Loggerhead	EN
8	*Chelonia Mydas*	Green Turtle	EN
9	*Heosemys Spinosa*	Spiny Terrapin, Spiny Turtle	EN
10	*Indotestudo Forstenii*	Celebes Tortoise	EN
11	*Manouria Emys*	Asian Giant Tortoise	EN
12	*Mauremys Reevesii*	Chinese Pond Turtle	EN
13	*Orlitia Borneensis*	Bornean River Turtle	EN
14	*Pelochelys Cantorii*	Cantor's Giant Softshell	EN
23	*Amyda Cartilaginea*	Asiatic Softshell Turtle	VU
24	*Carettochelys Insculpta*	Fly River Turtle	VU
25	*Chelodina Parkeri*	Parker's Snake-Necked Turtle	VU
26	*Cuora Amboinensis*	South Asian Box Turtle	VU
27	*Elseya Branderhorsti*		VU
28	*Lepidochelys Olivacea*	Olive Ridley, Pacific Ridley	VU
29	*Malayemys Subtrijuga*		VU
30	*Notochelys Platynota*	Malayan Flat-Shelled Turtle	VU
31	*Pelochelys Bibroni*	Asian Giant Softshell Turtle	VU
32	*Siebenrockiella Crassicollis*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
1	*Anisoptera Curtisii*		CR
2	*Anisoptera Megistocarpa*		CR
3	*Bruguiera Hainesii*		CR
4	*Cassine Koordersii*		CR
5	*Dehaasia Acuminata*		CR
6	*Dehaasia Chatacea*		CR
7	*Dehaasia Pugerensis*		CR
8	*Diospyros Molissima*		CR
9	*Dipterocarpus Applanatus*		CR
10	*Dipterocarpus Baudii*		CR
11	*Dipterocarpus Concavus*		CR
12	*Dipterocarpus Coriaceus*		CR
13	*Dipterocarpus Cornutus*		CR
14	*Dipterocarpus Costulatus*		CR
15	*Dipterocarpus Elongatus*		CR
16	*Dipterocarpus Eurynchus*		CR
17	*Dipterocarpus Fagineus*		CR
18	*Dipterocarpus Fusiformis*		CR

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No	**Scientific Name**	**Common Name**	**Threat Category**
19	*Dipterocarpus Glabrigemmatus*		CR
20	*Dipterocarpus Globosus*		CR
21	*Dipterocarpus Gracilis*		CR
22	*Dipterocarpus Grandiflorus*		CR
23	*Dipterocarpus Hasseltii*		CR
24	*Dipterocarpus Kerrii*		CR
25	*Dipterocarpus Kunstleri*		CR
26	*Dipterocarpus Littoralis*		CR
27	*Dipterocarpus Lowii*		CR
28	*Dipterocarpus Rigidus*		CR
29	*Dipterocarpus Semivestitus*		CR
30	*Dipterocarpus Tempehes*		CR
31	*Dipterocarpus Validus*		CR
32	*Dryobalanops Aromatica*	Camphor Tree, Indonesian Kapur	CR
33	*Dryobalanops Fusca*		CR
34	*Dryobalanops Keithii*		CR
35	*Hopea Bancana*		CR
36	*Hopea Beccariana*		CR
37	*Hopea Bilitonensis*		CR
38	*Hopea Coriacea*		CR
39	*Hopea Ferruginea*		CR
40	*Hopea Kerangasensis*		CR
41	*Hopea Mengerawan*		CR
42	*Hopea Micrantha*		CR
43	*Hopea Montana*		CR
44	*Hopea Nervosa*		CR
45	*Hopea Nigra*		CR
46	*Hopea Nutans*		CR
47	*Hopea Ovoidea*		CR
48	*Hopea Sangal*		CR
49	*Hopea Semicuneata*		CR
50	*Hopea Sphaerocarpa*		CR
51	*Hopea Wyatt-Smithii*		CR
52	*Madhuca Boerlageana*		CR
53	*Mangifera Campnospermoides*		CR
54	*Nepenthes Aristolochioides*		CR
55	*Nepenthes Clipeata*		CR
56	*Nepenthes Dubia*		CR
57	*Nepenthes Lavicola*		CR
58	*Nothaphoebe Javanica*		CR
59	*Parashorea Aptera*		CR

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No	**Scientific Name**	**Common Name**	**Threat Category**
60	*Parashorea Lucida*	White Meranti	CR
61	*Rhododendron Wilhelminae*		CR
62	*Saurauia Bogoriensis*		CR
63	*Shorea Acuminatissima*	Yellow Meranti	CR
64	*Shorea Balangeran*	Red Balau	CR
65	*Shorea Blumutensis*	Yellow Meranti	CR
66	*Shorea Carapae*		CR
67	*Shorea Conica*		CR
68	*Shorea Dealbata*	White Meranti	CR
69	*Shorea Elliptica*	Dark Red Meranti	CR
70	*Shorea Falciferoides*		CR
71	*Shorea Foxworthyi*		CR
72	*Shorea Guiso*	dfgadfg, Red Balau	CR
73	*Shorea Hopeifolia*	Yellow Meranti	CR
74	*Shorea Hypoleuca*		CR
75	*Shorea Inappendiculata*		CR
76	*Shorea Induplicata*		CR
77	*Shorea Johorensis*	Light Red Meranti	CR
78	*Shorea Kunstleri*	Red Balau	CR
79	*Shorea Lamellata*	White Meranti	CR
80	*Shorea Lepidota*	Light Red Meranti	CR
81	*Shorea Longiflora*		CR
82	*Shorea Longisperma*	Yellow Meranti	CR
83	*Shorea Macrantha*		CR
84	*Shorea Materialis*		CR
85	*Shorea Montigena*		CR
86	*Shorea Myrionerva*	Light Red Meranti	CR
87	*Shorea Ochrophloia*	Red Balau	CR
88	*Shorea Pallidifolia*		CR
89	*Shorea Peltata*	Yellow Meranti	CR
90	*Shorea Platycarpa*	Light Red Meranti	CR
91	*Shorea Polyandra*	Yellow Meranti	CR
92	*Shorea Resinosa*	White Meranti	CR
93	*Shorea Richetia*		CR
94	*Shorea Rugosa*	Dark Red Meranti	CR
95	*Shorea Selanica*		CR
96	*Shorea Singkawang*	Dark Red Meranti, Meranti Merah	CR
97	*Shorea Slootenii*		CR
98	*Shorea Smithiana*	Light Red Meranti	CR
99	*Shorea Xanthophylla*	Yellow Meranti	CR
100	*Sonneratia Griffithii*		CR

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101	*Sophora Rubriflora*		CR
102	*Syzygium Ampliflorum*		CR
103	*Vatica Cauliflora*		CR
104	*Vatica Chartacea*		CR
105	*Vatica Flavovirens*		CR
106	*Vatica Globosa*		CR
107	*Vatica Havilandii*		CR
108	*Vatica Maingayi*		CR
109	*Vatica Obovata*		CR
110	*Vatica Pentandra*		CR
111	*Vatica Ridleyana*		CR
112	*Vatica Rotata*		CR
113	*Vatica Sarawakensis*		CR
114	*Vatica Soepadmoi*		CR
115	*Vatica Teysmanniana*		CR
116	*Vatica Venulosa*		CR
117	*Alloxylon Brachycarpum*		EN
118	*Anisoptera Costata*		EN
119	*Anisoptera Grossivenia*		EN
120	*Anisoptera Laevis*		EN
121	*Anisoptera Marginata*		EN
122	*Bleasdalea Papuana*		EN
123	*Calophyllum Insularum*		EN
124	*Camptostemon Philippinense*		EN
125	*Canarium Kipella*		EN
126	*Cotylelobium Melanoxylon*		EN
127	*Cycas Javana*		EN
128	*Dipterocarpus Sublamellatus*		EN
129	*Dryobalanops Beccarii*		EN
130	*Dryobalanops Lanceolata*		EN
131	*Flindersia Pimenteliana*		EN
132	*Gnetum Oxycarpum*		EN
133	*Heliciopsis Lanceolata*		EN
134	*Heritiera Globosa*		EN
135	*Heritiera Percoriacea*		EN
136	*Hopea Celebica*		EN
137	*Hopea Dasyrrhachis*		EN
138	*Hopea Fluvialis*		EN
139	*Hopea Gregaria*		EN
140	*Hopea Pedicellata*		EN
141	*Hopea Pierrei*		EN

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142	*Lasianthus Tomentosus*		EN
143	*Limnocitrus Littoralis*		EN
144	*Lithocarpus Crassinervius*		EN
145	*Lithocarpus Kostermansii*		EN
146	*Lithocarpus Platycarpus*		EN
147	*Mangifera Blommesteinii*		EN
148	*Mangifera Paludosa*		EN
149	*Manilkara Kanosiensis*		EN
150	*Myristica Teijsmannii*		EN
151	*Nepenthes Boschiana*		EN
152	*Nepenthes Paniculata*		EN
153	*Nepenthes Pilosa*		EN
154	*Nepenthes Talangensis*		EN
155	*Nothofagus Womersleyi*		EN
156	*Parashorea Globosa*	White Seraya	EN
157	*Podocarpus Deflexus*		EN
158	*Podocarpus Laubenfelsii*		EN
159	*Prunus Adenopoda*		EN
160	*Prunus Turfosa*		EN
161	*Schefflera Fastigiata*		EN
162	*Schefflera Multifoliolata*		EN
163	*Shorea Agami*	White Meranti	EN
164	*Shorea Albida*	Light Red Meranti	EN
165	*Shorea Argentifolia*	Dark Red Meranti	EN
166	*Shorea Balanocarpoides*	White Meranti, Yellow Meranti	EN
167	*Shorea Bracteolata*	White Meranti	EN
168	*Shorea Dasyphylla*		EN
169	*Shorea Domatiosa*		EN
170	*Shorea Faguetiana*	Yellow Meranti	EN
171	*Shorea Falcifera*		EN
172	*Shorea Glauca*		EN
173	*Shorea Gratissima*		EN
174	*Shorea Leprosula*	Light Red Meranti, Meranti	EN
175	*Shorea Maxwelliana*		EN
176	*Shorea Obscura*		EN
177	*Shorea Ovata*	Dark Red Meranti	EN
178	*Shorea Pauciflora*	Dark Red Meranti, Red Lauan	EN
179	*Shorea Platyclados*	Dark Red Meranti	EN
180	*Shorea Teysmanniana*	Light Red Meranti	EN
181	*Symplocos Junghuhnii*		EN
182	*Syzygium Discophorum*		EN

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No	**Scientific Name**	**Common Name**	**Threat Category**
183	*Taxus Wallichiana*	Himalayan Yew	EN
184	*Upuna Borneensis*		EN
185	*Vatica Bantamensis*		EN
186	*Vatica Brunigii*		EN
187	*Vatica Lowii*		EN
188	*Vatica Maritima*		EN
189	*Vatica Pauciflora*		EN
190	*Vatica Stapfiana*		EN
191	*Mangifera Casturi*	Kalimantan Mango, Kasturi	EN
192	*Afzelia Rhomboidea*		VU
193	*Aglaia Angustifolia*		VU
194	*Aglaia Barbanthera*		VU
195	*Aglaia Brassii*		VU
196	*Aglaia Brownii*		VU
197	*Aglaia Ceramica*		VU
198	*Aglaia Cinnamomea*		VU
199	*Aglaia Coriacea*		VU
200	*Aglaia Flavescens*		VU
201	*Aglaia Laxiflora*		VU
202	*Aglaia Lepiorrhachis*		VU
203	*Aglaia Membranifolia*		VU
204	*Aglaia Polyneura*		VU
205	*Aglaia Puberulanthera*		VU
206	*Aglaia Ramotricha*		VU
207	*Aglaia Rivularis*		VU
208	*Aglaia Scortechinii*		VU
209	*Aglaia Smithii*		VU
210	*Aglaia Speciosa*		VU
211	*Aglaia Tenuicaulis*		VU
212	*Aglaia Variisquama*		VU
213	*Aglaia Yzermannii*		VU
214	*Alangium Havilandii*		VU
215	*Alangium Longiflorum*		VU
216	*Alstonia Beatricis*		VU
217	*Anisophyllea Ferruginea*		VU
218	*Anisophyllea Rhomboidea*		VU
219	*Aquilaria Beccariana*		VU
220	*Aquilaria Cumingiana*		VU
221	*Aquilaria Hirta*		VU
222	*Aquilaria Malaccensis*	Agarwood, Aloewood, Eaglewood	VU
223	*Aquilaria Microcarpa*		VU

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No	**Scientific Name**	**Common Name**	**Threat Category**
224	*Aralia Javanica*		VU
225	*Avicennia Rumphiana*		VU
226	*Burkillanthus Malaccensis*		VU
227	*Calophyllum Bifurcatum*		VU
228	*Calophyllum Caudatum*		VU
229	*Calophyllum Havilandii*		VU
230	*Calophyllum Macrophyllum*		VU
231	*Calophyllum Parvifolium*		VU
232	*Calophyllum Rufinerve*		VU
233	*Calophyllum Savannarum*		VU
234	*Canarium Pseudodecumanum*		VU
235	*Canarium Pseudopatentinervium*		VU
236	*Cantleya Corniculata*		VU
237	*Casearia Flavovirens*		VU
238	*Ceratopetalum Succirubrum*		VU
239	*Chisocheton Stellatus*		VU
240	*Clethra Javanica*		VU
241	*Combretocarpus Rotundatus*		VU
242	*Cotylelobium Lanceolatum*		VU
243	*Crudia Splendens*		VU
244	*Cupaniopsis Strigosa*		VU
245	*Cycas Falcata*		VU
246	*Cyrtandra Elbertii*		VU
247	*Dacrydium Leptophyllum*		VU
248	*Dalbergia Latifolia*	Bombay Blackwood	VU
249	*Diospyros Celebica*	Indonesian Ebony	VU
250	*Diplycosia Pilosa*		VU
251	*Dipterocarpus Retusus*		VU
252	*Durio Acutifolius*		VU
253	*Durio Dulcis*		VU
254	*Durio Kutejensis*		VU
255	*Durio Testudinarum*		VU
256	*Dyera Polyphylla*		VU
257	*Elaeocarpus Brigittae*		VU
258	*Elaeocarpus Royenii*		VU
259	*Elaeocarpus Simaluensis*		VU
260	*Elattostachys Erythrocarpum*		VU
261	*Endocomia Canarioides*		VU
262	*Erythrina Euodiphylla*		VU
263	*Eusideroxylon Zwageri*	Billian, Borneo Ironwood	VU
264	*Flindersia Laevicarpa*		VU

FLORA CR = critically endangered; EN = endangered; VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
265	*Goniothalamus Majestatis*		VU
266	*Gonystylus Bancanus*		VU
267	*Gonystylus Consanguineus*		VU
268	*Gonystylus Glaucescens*		VU
269	*Gonystylus Keithii*		VU
270	*Gonystylus Macrophyllus*		VU
271	*Gonystylus Xylocarpus*		VU
272	*Guioa Asquamosa*		VU
273	*Guioa Malukuensis*		VU
274	*Guioa Melanopoda*		VU
275	*Guioa Multijuga*		VU
276	*Guioa Oligotricha*		VU
277	*Guioa Patentinervis*		VU
278	*Guioa Pauciflora*		VU
279	*Guioa Venusta*		VU
280	*Guioa Waigeoensis*		VU
281	*Hopea Pachycarpa*		VU
282	*Horsfieldia Atjehensis*		VU
283	*Horsfieldia Borneensis*		VU
284	*Horsfieldia Decalvata*		VU
285	*Horsfieldia Fragillima*		VU
286	*Horsfieldia Fulva*		VU
287	*Horsfieldia Hirtiflora*		VU
288	*Horsfieldia Iriana*		VU
289	*Horsfieldia Macilenta*		VU
290	*Horsfieldia Motleyi*		VU
291	*Horsfieldia Obscura*		VU
292	*Horsfieldia Pachyrachis*		VU
293	*Horsfieldia Pulcherrima*		VU
294	*Horsfieldia Talaudensis*		VU
295	*Horsfieldia Triandra*		VU
296	*Horsfieldia Tristis*		VU
297	*Horsfieldia Valida*		VU
298	*Intsia Bijuga*	Borneo Teak, Moluccan Ironwood	VU
299	*Kalappia Celebica*		VU
300	*Kayea Macrophylla*		VU
301	*Kibatalia Villosa*		VU
302	*Kibatalia Wigmani*		VU
303	*Knema Celebica*		VU
304	*Knema Emmae*		VU
305	*Knema Hookerana*		VU

FLORA CR = critically endangered; EN = endangered; VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
306	*Knema Kostermansiana*		VU
307	*Knema Krusemaniana*		VU
308	*Knema Lampongensis*		VU
309	*Knema Longepilosa*		VU
310	*Knema Mamillata*		VU
311	*Knema Matanensis*		VU
312	*Knema Mogeana*		VU
313	*Knema Psilantha*		VU
314	*Knema Riangensis*		VU
315	*Knema Sericea*		VU
316	*Knema Steenisii*		VU
317	*Knema Uliginosa*		VU
318	*Koompassia Grandiflora*		VU
319	*Lithocarpus Indutus*		VU
320	*Macropanax Concinnus*		VU
321	*Madhuca Betis*		VU
322	*Mammea Timorensis*		VU
323	*Mangifera Altissima*		VU
324	*Mangifera Dewildei*		VU
325	*Mangifera Macrocarpa*		VU
326	*Mangifera Pajang*		VU
327	*Mangifera Pedicellata*		VU
328	*Mangifera Rufocostata*	Asem Kiat	VU
329	*Mangifera Similis*		VU
330	*Mangifera Sumbawaensis*		VU
331	*Mangifera Transversalis*		VU
332	*Merrillia Caloxylon*		VU
333	*Myristica Alba*		VU
334	*Myristica Arfakensis*		VU
335	*Myristica Buchneriana*		VU
336	*Myristica Devogelii*		VU
337	*Myristica Extensa*		VU
338	*Myristica Fissurata*		VU
339	*Myristica Flavovirens*		VU
340	*Myristica Inaequalis*		VU
341	*Myristica Kjellbergii*		VU
342	*Myristica Mediterranea*		VU
343	*Myristica Millepunctata*		VU
344	*Myristica Papillatifolia*		VU
345	*Myristica Perlaevis*		VU
346	*Myristica Pubicarpa*		VU

FLORA CR = critically endangered; EN = endangered; VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
347	*Myristica Robusta*		VU
348	*Myristica Sarcantha*		VU
349	*Myristica Tamrauensis*		VU
350	*Myristica Trianthera*		VU
351	*Myristica Ultrabasica*		VU
352	*Myristica Verruculosa*		VU
353	*Nepenthes Bicalcarata*		VU
354	*Nepenthes Bongso*		VU
355	*Nepenthes Danseri*		VU
356	*Nepenthes Ephippiata*		VU
357	*Nepenthes Eymae*		VU
358	*Nepenthes Fusca*		VU
359	*Nepenthes Glabrata*		VU
360	*Nepenthes Hamata*		VU
361	*Nepenthes Inermis*		VU
362	*Nepenthes Insignis*		VU
363	*Nepenthes Klossii*		VU
364	*Nepenthes Mikei*		VU
365	*Nepenthes Ovata*		VU
366	*Nepenthes Rhombicaulis*		VU
367	*Nepenthes Singalana*		VU
368	*Nepenthes Spathulata*		VU
369	*Nepenthes Spectabilis*		VU
370	*Nepenthes Tomoriana*		VU
371	*Nepenthes Treubiana*		VU
372	*Nothofagus Stylosa*		VU
373	*Palaquium Bataanense*		VU
374	*Pericopsis Mooniana*	Nandu Wood, Nedun Tree	VU
375	*Pinus Merkusii*	Merkus Pine, Mindoro Pine	VU
376	*Prunus Laxinervis*		VU
377	*Pterocarpus Indicus*	Amboyna Wood	VU
378	*Rhododendron Album*		VU
379	*Rhododendron Loerzingii*		VU
380	*Santalum Album*	Sandalwood	VU
381	*Saurauia Bracteosa*		VU
382	*Saurauia Cauliflora*		VU
383	*Saurauia Lanceolata*		VU
384	*Saurauia Microphylla*		VU
385	*Schefflera Capitulifera*		VU
386	*Shorea Uliginosa*		VU
387	*Sindora Inermis*		VU

FLORA CR = critically endangered; EN = endangered; VU = vulnerable			
No	**Scientific Name**	**Common Name**	**Threat Category**
388	*Sindora Javanica*		VU
389	*Sympetalandra Schmutzii*		VU
390	*Symplocos Costata*		VU
391	*Tabernaemontana Remota*		VU
392	*Terminalia Kangeanensis*		VU
393	*Ternstroemia Penangiana*		VU
394	*Vernonia Zollingerianoides*		VU
395	*Vitex Parviflora*		VU

Source: IUCN 2012

ANNEX G. TREATIES AND CONVENTIONS RELATED TO THE PROTECTION OF FAUNA AND FLORA TO WHICH INDONESIA IS A PARTY OR SIGNATORY

Name	Year
Convention on International Trade in Endangered Species of Wild Fauna and Flora	1979
Manila Declaration on the ASEAN Environment	1981
ASEAN Ministerial Understanding on Fisheries Cooperation	1983
ASEAN Declaration on Heritage Parks and Reserves	1984
Bangkok Declaration on the ASEAN Environment	1984
Agreement on the Conservation of Nature and Natural Resources	1985
Fourth Circum-Pacific Energy and Mineral Resources Conference	1986
International Fund for Agricultural Development (IFAD)	1987
Jakarta Resolution on Sustainable Development	1987
Agreement on the Network of Aquaculture Centers in Asia and the Pacific	1988
Convention Concerning the Protection of the World Cultural and Natural Heritage	1989
The Nagao Natural Environment Foundation	1989
The International Tropical Timber Organization	1990
The Kuala Lumpur Accord on Environment and Development	1990
Singapore Resolution on Environment and Development	1992
The Montreal Protocol on Substances that Deplete the Ozone Layer	1992
The Ramsar Convention on Wetlands	1992
Vienna Convention for the Protection of the Ozone Layer	1992
Rainforest Action Network Protect-an-Acre Program	1993
The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1993
ASEAN Regional Forum	1994
Bandar Seri Begawan Resolution on Environment and Development	1994
The Convention on Biological Diversity	1994
United Nations Framework Convention on Climate Change	1994
World Wildlife Fund (WWF) on The Free Trade Area	1994
Jakarta Declaration on Environment and Development	1997
United Nations Convention to Combat Desertification	1998
Humane Society International Wildlife Land Trust	2000
Integrated Coastal Resource Management	2001
ASEAN Agreement on Transboundary Haze Pollution	2002
The Sumatran Tiger Conservation Program and Sumatran Tiger Trust (UK)	2002
ASEAN Declaration on Heritage Parks	2003
Indonesian Trade Union Confederation	2003

Name	Year
Yangon Resolution on Sustainable Development	2003
The Cartagena Protocol on Biosafety	2004
Agreement on Establishment of ASEAN Centre for Biodiversity	2005
East Asia Summit	2005
Kyoto Protocol	2005
Cebu Resolution on Sustainable Development	2006
International Treaty on Plant Genetic Resources	2006
Ad Hoc Joint Working Group	2007
ASEAN Declaration on Environmental Sustainability	2007
ASEAN Declaration on the 13th session of the Conference of the Parties to the UNFCCC and the 3rd session of the CMP to the Kyoto Protocol	2007
Bali Climate Change Conference	2007
Organization for the Prohibition of Chemical Weapons	2007
Sustainable Strategic Development of Tomini Bay with IUCN	2007
Basel Convention COP 9	2008
Rotterdam Convention COP 4	2008
The ministers and other heads of delegation from the parties to the Basel Convention on the ninth meeting of the Conference of the Parties to the Basel Convention on the Control of the Transboundary Movements of Hazardous Wastes and Their Disposal	2008
G20 summit in Pittsburgh, to voluntarily reduce its greenhouse gas emissions and to curb emissions by reducing deforestation and forest degradation	2009
Stockholm Convention COP 4	2009
Stockholm Convention on Persistent Organic Pollutants	2009
The Indonesian Petroleum Association	2009
World Ocean Conference	2009
Convention on Biological Diversity Working Group on Access and Benefit-Sharing	2010
Eleventh Meeting of the Special Session of the UNEP Governing Council/Global Ministerial Environment Forum (GC-UNEP)	2010
Extraordinary Conferences of the Parties to the Basel, Rotterdam and Stockholm Conventions	2010
Fourth Policy Board Meeting of the UN-REDD Programme	2010
International Atomic Energy Agency	2010
Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity	2010
Rotterdam Convention Sixth Meeting of The Chemical Review	2010
Stockholm Convention Regional Training	2010
The Eleventh Global Major Groups and Stakeholders Forum (GMGSF -11)	2010
The Eleventh Special Session of the U.N. Environment Programme Governing Council / Global Ministerial Environment Forum (GCSS-11/GMEF)	2010
The Eleventh special session of the U.N. Environment Programme Governing Council / Global Ministerial Environment Forum (GCSS-11/GMEF)	2010
The ExCOPs of the Basel, Rotterdam and Stockholm Conventions	2010
The fifth meeting of the Conference of the Parties to the Convention on Biological Diversity	2010
The Regional Technical Training Workshop for the Environmentally South Management of Asbestos Waste	2010

Name	Year
The simultaneous extraordinary Conferences of the Parties (ExCOPs) to the Basel, Rotterdam and Stockholm Conventions	2010
The Strategic Approach to International Chemicals Management (SAICM) Secretariat, in collaboration with the Ministry of Land and Environment, Jamaica, is organizing a Latin American and Caribbean (LAC) regional meeting on the SAICM	2010
The tenth meeting of the Conference of the Parties (COP 10) to the Convention on Biological Diversity	2010
Alternative futures to meet demands for food, fiber, fuel and REDD+	2011
Inception Meeting: Biodiversity and Climate Change Project	2011
Maritime Border Diplomacy on the 35th Annual Conference of the Center for Oceans Law and Policy	2011
The 5th Indonesian International Cocoa Conference	2011
The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD)	2011
Voluntary partnership agreement signed by an Asian nation with the EU on the fight against the illegal logging trade worldwide	2011
IEEE International Conference on Condition Monitoring and Diagnosis	2012
Indonesian Pulp and Paper Association	2012
Ink Tax Treaty	2012
International Conference of Aquaculture Indonesia	2012
International Multi-Conference on Agricultural, Chemical, Biological and Ecosystems	2012
The 10th Annual Meeting of the Roundtable on Sustainable Palm Oil (RSPO)	2012
The Canadian International Development Agency (CIDA) for Indonesia	2012
The ExCOPs of the Basel, Rotterdam and Stockholm Conventions	2012
The Impacts of Climate Change to Forest Pests and Diseases in the Tropics	2012
The International Convention for the Prevention of Pollution from Ships (MARPOL)	2012
The International Convention on Maritime Search and Rescue (SAR)	2012
The World Food Programme (WFP) and Provincial Government of West Nusa Tenggara pledged to enhance cooperation during a workshop on “Strengthening Food Security and Community Resilience Against Disaster and Climate Change"	2012
Workshop on National Reporting and Inventory of the Basel Convention	2012
The Indonesian Palm Oil Conference & Price Outlook	2013
SEAFDEC-ASEAN on the promotion of mangrove-friendly aquaculture and the regionalization of the Code of Conduct for Responsible Fisheries	tbd
Southeast Asian Fisheries Development Centre (SEAFDEC) on the Departmental Programmes on Aquaculture	tbd
The International Union of Forest Research Organizations	tbd
The Mangrove for the Future investing in Coastal Ecosystems	tbd
United Nations Industrial Development Organization (UNIDO)	tbd
World Trade Organization	tbd

Note: tbd – to be determined
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ANNEX H. BRIEF SUMMARY OF SELECTED NEW (SINCE 2008) ENVIRONMENT LAWS

A. Law No 4/2009: Mining

In the implementation of Law No.4/2009 on Mining, the main consideration that may have a big impact on environmental management is that the licences for mining business are issued by central, provincial, or regional government, depending on whether the mining project crosses regional or provincial boundaries. If we compare this with the local goverment's capacity regarding mining management, then this license that is issued by local goverment provides a substantial opportunity to create another threat to environment and the habitat and to create greater issues for their management. The possibilities are higher when there is a tendency for the local goverment to prefer improvements to the local goverment's budget over environmental concerns.

B. Law No 32/2009: Environmental Management and Protection Law

The Indonesian government has revised and replaced the Environmental Management Act (*UU Lingkungan Hidup*) No. 23/1997 with a new Environmental Protection and Management Act No. 32/2009, which was enacted on October 3, 2009. The new law aligns with Autonomy Law No.32/2004 and Spatial Planning Law No. 26/2007.

According to this new law, strategic environmental assessments (SEAs) are contained in six articles: Article 1, Article14 through Article 19. Important elements include:

a. Article 1 paragraph (10) defines SEAs as "a series of systematic, comprehensive, and participatory analyses to ensure that sustainable development principles have been adopted as a basis of and integrated into the development of a region and/or policy, plan, and/or program.
b. Article 15 paragraphs (1) and (2) stipulate that central and local governments assume the obligation to undertake SEAs and implement SEAs recommendations in preparation or evaluation of:
    - Regional Spatial Plan (RTRW) and the detailed spatial plans and long- and medium-term national, provincial, and district/city development plans
    - Policies, plans, and/or programs that have a potential negative environmental impact and/or environmental risk
c. Article 15 paragraph (3) contains stipulations concerning the protocols of undertaking SEAs.
d. Article 16 contains stipulations concerning the materials content of SEAs.
e. Article 17 contains stipulations concerning the use of SEAs results and recommendations.
f. Article 18 contains stipulations concerning stakeholders and community participation.
g. Article 19 contains stipulations concerning the application of SEAs in spatial planning.

The above articles of Environmental Protection and Management Law No 32/2009 concerning SEAs make it compulsory for central, provincial, and district/municipality governments to undertake SEAs in connection with preparation or evaluation of their spatial and development

plans. Specifically, SEAs must be undertaken in the process of preparing spatial plans, long-term and medium-term development plans, and policies, plans and/or programs that have a potential negative environmental impact and/or risks.

Although the major message of these articles is to ensure that sustainable development principles have been adopted as the basis for developing spatial and development plans, there seems to be an open opportunity for the national and local governments to use SEAs to improve the integration, synchronization, and coherence between spatial plans and development plans, between plans of different levels of governments, as well as across plans of different provinces of districts/municipalities. The Act also states that results of SEAs would guide revision of evelopment policies, plans, programs, or discontinuation of activities/business, should the SEA indicate “carrying capacity” has been exceeded.

A change in the legal framework of environmental protection and management that is in line with the Regional Autonomy Law has a certain implication in the long run as well as in the short run at national and regional (province and district/city) levels. There is a requirement to develop and improve new instruments that are needed by the local governments in implementing the law. The law must also be supported by implementing regulations and technical guidance, including government and ministerial regulations and technical guidance materials. Implementation of the law also requires capacity building endeavors, as well as awareness-raising activities at national and local levels.

C. Govermental Law No 23/ 2010: Implementation of Mineral and Coal Mining Business Activities

Based on its consideration, the new goverment regulation was made to manage mining permits and to provide a better opportunity for Indonesian participants to take part in mining activities, provide better legal certainty in regulating mining activities in Indonesia, and to reinforce the authority of the central government in the administration of mining activities. The first changes in government regulations were to divide the previous classification of business entities into foreign and domestic investments.

The first changes in government regulations were to divide the previous classification of business entities become into two classifications of private entities: business enterprise conducted within the framework of foreign investment and domestic investment (Article 3a). In addition, the Perusahaan Ter PMA permits can only be granted by the minister. It is not possible to have a mining permit issued by local government even if the mining area (WIUP) does not cross provincial or city/regency boundaries(Article 3b). An added regulation to the Mining Area law pertains to relinquishing and terminating the issuance of mining permits and IUPK. The WIUP/WIUPK now needs to be returned directly to the minister and not to the local government (Article 74 paragraph 4) because permits holders applied to the minister, governors, or regents/mayors in accordance with their authority (paragraph 1).

These changes also try to address the mining permit that released by local government that become threats for the environment.

D. Govermental Law No. 27/2012: Environment License

On February 23, 2012, Government Regulation No. 27 of 2012 on Environmental Licenses (GR 27/2012) was issued to regulate AMDAL, UPL & UKL and contamination and destruction of the environment. GR 27/2012 is the implementing regulation for Articles 33, 41, and 56 of Law No. 32 of 2009 on Environmental Protection and Management, which replaced Government Regulation No. 27 of 1999 on Environmental Impact Analysis. An environmental license is now defined as a license issued to a party engaged in any business activity which requires an environmental impact analysis (*Analisis Mengenai Dampak Lingkungan – AMDAL*) or environmental management efforts and environment monitoring efforts (*Upaya Pengelolaan Lingkungan Hidup dan Upaya Pemantauan Lingkungan Hidup – UKL-UPL*) for protection and management of the environment as a prerequisite for a business license. In principle, the AMDAL is a study of the potential significant impact of the proposed business activity on the environment, while the UKL-UPL covers monitoring and management efforts undertaken for business activities that are not likely to have a significant impact on the environment.

The required AMDAL and UKL-UPL assessments must be completed before an environmental license can be issued. In other words, any business activities that require an AMDAL or UKL-UPL also require an environmental license. The application for an environmental license must be submitted with its supporting documents, such as the AMDAL or UKL and UPL, to the minister of environmental affairs, governor, or mayor/regent in line with their respective authorities. The application will be published in the media and posted on a notice board at the site within five working days of receipt of the complete application. Sanctions for failure to comply with GR 27/2012 may include written warnings, government action, and the suspension and eventual revocation of the environmental license.

This regulation is expected to deliver legal certainty for the businesses in terms of licensing in the environmental matter, while ensuring implementation of good protection and management of the environment and the balance of all stakeholders.

E. Govermental Law No 60/2012: Procedure of Modification of Intended Uses and Functions of Forest Area and Govermental Law No 61/2012: Utilization of Forest Area

The government issued two regulations that nullify the illegal status of plantation and mining activities in forest areas without a permit from the forestry minister. Those regulations include Government Regulation No. 60/2012 on Amendment to Government Regulation No. 10 on Procedure of Modification of Intended Uses and Functions of Forest Area. The regulation will become a gateway for plantation companies that will receive legal status after they have been operating without a forest relinquishment license.

The second regulation is Government Regulation No. 61/2012 on Amendment to Government Regulation No. 24/2010 on Goverment Law No 61/2012. This regulation opens the door for mining activity that was formerly considered illegal because of the lack of a license to use and leasehold forest area. Both regulations were signed by the president of Indonesia on July 6, 2012. Each regulation stipulates that plantation and mining operations allowed are those that have had a business license issued by the regional government. Plantation or mining location must refer to regional regulation concerning regional spatial planning of provinces or regencies/municipalities

that was stipulated before the validity of Law No. 26/2007 on Spatial Planning. And, pursuant to Law No. 41/1999 on Forestry, plantation and mining activities are in production forests or convertible production forests.

In the process of allowing of operation of plantation activity, the forestry minister will issue a forest relinquishment license. For mining activity, the minister will issue a license to use and leasehold forest area. Plantation companies who wish to receive nullification are required to provide substitute land with ratio of size of land of 1:1 if it is in a production forest. The ratio of substitute land is increased to 1:2 if the plantation is in a river basin (DAS), on an island, or in a province with a forest area of less than 30 percent. Substitute land is not required if a plantation is in a convertible production forest.

This regulation is not referenced to Law No 41/1999 on Forestry and become a new driver for land conversion into plantations in Indonesia that became the top threat to the environment.

Conclusion

Implementation of decentralization brought significant changes to natural resource management. Central government made a substantial transfer of authority to local governments, including authorities on issuing permits. This generated a fundamental change in the natural resource management decision-making process. Local governments argued that they were now responsible for the welfare of their communities as stipulated in Art 33 State Constitution 1945 and therefore were authorized to issue permits and develop policy instruments at an operational level on natural resource management. Decentralization introduced a licensing system as opposed to a working contract.

The implication is a new licensing system paradigm. Local governments play bigger roles on establishment of permits at the operational level. This is seen as an impetus for accelerating regional economic growth, increasing government revenue and non-tax income. However, this new environmental management system is not in line with local goverment capacity. Local government staffs do not have adequate training, expertise, or experience. An example is when in one jurisdiction there is a growing demand on mining permits, the local government should update the local information database used in the Regional Spatial Master Plan. This is not happening.

In practice, local governments are facing administrative boundary issues, resource-use conflict, intergovernmental conflict of authorities, and transboundary administrative issues. In addition, there is uncertainty of administrative legal authority for resources permit issuance, due to overlapping administrative mining areas within inter-regional government administrative/ regional spatial use management.The implication of good mining practices to environmental issues for green mining practices has to be reviewed; preservation and conservation practices evaluation are also needed. Lessons learned have to be confirmed, and social acceptability for public participation procedure, including corporate social responsibility programs, need to have a transparent forum for review, debate, and discussion.

ANNEX I. OTHER DONOR INITIATIVES, PROJECTS, AND APPROACHES

A number of initiatives and organizations in Indonesia are already addressing some of the identified necessary actions. Numerous organizations and other players have biodiversity conservation within their mandates, and several successful approaches are being used.

Asian Development Bank (ADB)

ADB provided a $1.5 million grant for conservation activities for the Heart of Borneo and Coral Triangle Initiatives. The ADB is collaborating with the World Wildlife Fund's sustainable environmental development in these areas, among other geographically specific areas and climate change.

In the Heart of Borneo, ADB and WWF work on conservation, protected areas, transboundary collaboration, ecosystems, and species. Recent activities include launch of the Kalimantan Green Economy Corridor Project that intends to analyze and develop options so that economic growth supports natural and social capita, and members of the Forum of the Indigenous Peoples of the Highlands of Borneo from Malaysia and Indonesia came to an agreement on transboundary ecotourism.

In the Coral Triangle, ADB and WWF partner on climate change, conservation efforts of marine turtles, collaborate with the tuna fishing industry to encourage sustainable practices, and collaborate with stakeholders to protect marine protected areas across the Coral Triangle.
http://wwf.panda.org/what_we_do/where_we_work/borneo_forests/
http://wwf.panda.org/what_we_do/where_we_work/coraltriangle/

Australia Aid (AusAID)

AusAID supports the Indonesian government on climate change activities through the Indonesia-Australia Forest Carbon Partnership, which encourages policy dialogue, development of Indonesia's National Carbon Accounting Systems, and demonstration activities in Central Kalimantan. These activities include planting seedlings in community nurseries for Kalimantan's REDD+ project; tracking and monitoring tropical peat to reduce fire risk; incentive payments to local communities for delivery environment work aligning with development goals of emissions reduction and sustainable development of projects; and establishment of IndoFire, a real-time, online forest fire monitoring system that enables Indonesian authorities to effectively prevent, manage, and suppress fires.
http://www.ausaid.gov.au/countries/eastasia/indonesia/Pages/climate-change-init1.aspx

Conservation International

Conservation International's activities in Indonesia include a range of activities that consist of species conservation, monitoring and distributing information, and engaging religious organizations and leadership on conservation issues. The Javan Gibbon Center's Recovery and Rehabilitation Program has improved the situation for this species by protecting their habitat and

monitoring with camera traps. Additionally, the center conducts community awareness and education programs to local people.

In addition to conservation education at the local level, Conservation International has created databases, including information on endangered species in Indonesia. This information is used to determine locations of important biodiversity areas.
http://www.conservation.org/where/asia-pacific/indonesia/pages/projects.aspx

U.K. Department for International Development

The U.K. Department for International Development is funding multiple forestry and climate change projects, including Improving Governance of Land Use, Land-Use Change and Forestry in Indonesia, which supports national and local governments and civil society organizations to build capacity and technical assistance for good governance of land use and forestry.
http://projects.dfid.gov.uk/Default.aspx

European Union (EU)

The EU is supporting projects in environmental policy and administrative management, climate change, fishing policy, and smaller education/training activities. In efforts to support an eco-friendly Batik industry, the union works in six provinces (West Java, Central Java, Jogjakarta, East Java, South Sulawesi, and east Kalimantan) tackling sustainable production and consumption. In assisting ASEAN countries in developing capacity for REDD+ projects, the EU is supporting communities and local governments in West Kalimantan to actively participate in REDD+ projects. The lessons learned from practical local experience are fed into policy dialogues at national and regional levels seeking higher-level policy responses to deforestation and forest degradation.

The EU has funded preparation, negotiation, and implementation of FLEGT-Voluntary Partnership Agreement, which is focused in Jakarta, Riau, West Kalimantan, Central Kalimantan, South Sulawesi, West Papua, and Central Java. Indonesia is a member country of the EU FLEGT and is at Phase 3: System development of the four-phase FLEGT Voluntary Partnership Agreement timeline.
http://eeas.europa.eu/delegations/indonesia/projects/list_of_projects/projects_en.htm
http://www.euflegt.efi.int/portal/home/vpa_countries/in_asia/indonesia/

Flora & Fauna International (FFI)

FFI established a country program with the signing of a memorandum of understanding with the Indonesian Ministry of Forestry in 1996. Since then, a network of partners has been built from civil societies and private businesses. FFI's programs include REDD+ and natural resource and biodiversity conservation. Currently, FFI is exploring methods to harness payment for ecosystems services for the benefit of conservation and local communities. Additionally, FFI works with local grassroots groups such as Green Monster to reduce pollution in the Muara Angke Wildlife Sanctuary. Through media campaigns, school visits, and establishing a wetland and mangrove education center, Green Monster and FFI are educating communities on the

importance of flood mitigation and biodiversity conservation of important wetlands. http://www.fauna-flora.org/explore/indonesia/

Food and Agriculture Organization

FAO has programs supporting forestry and fisheries in Indonesia; the most notable is FAO's participation in the U.N.-REDD program. The FAO provides technical assistance on measuring, reporting, and verification of forest carbon, where a letter of agreement has been signed between the FAO and Ministry of Forestry. The technical assistance includes capacity development on methodology design of MRVs with sub-national pilot implementation. This will lead to collaborating with national and local institutions developing new approaches, in addition to existing national forest inventory and building capacity.

Additionally, the FAO is assisting the government to develop a methodological approach to set up workable and verifiable reference emission levels against future efforts to reduce deforestation, and forest degradation will be measured. http://coin.fao.org/cms/world/indonesia/en/ProgrammesProjects/Forestry/IndonesiaUN-REDDNationalJointProgramme/cont.html

Global Environmental Facility

As the financial mechanism for the U.N. Convention on Biological Diversity and the U.N. Framework Convention on Climate Change, the Global Environmental Facility is financing multiple national level projects in Indonesia, which include Citarum Watershed Management and Biodiversity Conservation Project, Coral Reef Rehabilitation and Management Program – Coral Triangle Initiative, Phase III, and Enhancing the Protected Area System in Sulawesi. http://www.thegef.org/gef/gef_projects_funding

GiZ

As a priority partner country of the German international cooperation, GiZ assists the Indonesian government with environment and climate change activities, including policy advice. Notable programs include the Forests and Climate Change Program, which seeks to improve the institutional and regulatory framework needed to apply methods and services for nature conservation and sustainable forest management. In the longer term, greenhouse gas emissions from the forest sector are reduced and livelihoods in rural communities improve. The program takes a three-prong approach supporting the Ministry of Forestry in establishing frameworks required for implementation of REDD and sustainable forest management, assists local authorities in districts and provinces to practice sustainable forest management and secure preconditions to conduct REDD activities; and the Heart of Borneo Initiative, which promotes conservation and sustainable development to government agencies, local communities, and the private sector.

In West Kalimantan, GiZ supports capacity building of GIS capabilities and technologies to establish forestry information systems, for REDD+ activities and sustainable management of forest resources. http://www.forclime.org/

Japan International Cooperation Agency

The Japan International Cooperation Agency currently implements a technical cooperation project — Capacity Development for Climate Change Strategies in Indonesia — with the National Development Planning Agency (BAPPENAS), which consists of three components: vulnerability assessment, preparing national greenhouse gas inventories, and formulating nationally appropriate mitigation actions in a measuring, reporting, and verification manner to integrate into development planning. Pilot sites are North and South Sumatra, with the exception of the vulnerability assessment being conducted in Bali. http://www.greenclimateproject.org

KEHATI (Indonesia Biodiversity Foundation)

KEHATI is a local NGO with programming in conservation and sustainable ecosystems use, education, and public outreach, and a multi-stakeholder forestry program engaging government, NGOs, and local communities. The 2008-2012 strategic plan built a framework categorizing their program activities within three ecosystems: agro, forest, and coastal and small islands. Each ecosystem's program has specific efforts. The agro ecosystem's program primarily works for conservation of germplasm, and the coastal and small islands program hones sustainable tourism, rehabilitation of mangroves, and preservation of endangered species. The largest program is the forest program, which works at the community level on forest management and multi-stakeholder forest management. http://www.kehati.or.id/

Millennium Challenge Corporation (MCC)

The MCC declared Indonesia eligible for compact funds in 2008 and provided $600 million for a five year program. Of this total, $332.5 million is funding the Green Prosperity Project, which is to expand renewable energy and reduce land-based greenhouse gas emission by improving land use practices and management of natural resources. Through technical and financial assistance for projects in renewable energy and natural resource manage, the project envisions the reduction of reliance on fossil fuels, improvement of land management practices, and protection of natural capital. http://www.mcc.gov/pages/countries/program/indonesia-compact

The Nature Conservancy (TNC)

TNC is working with government, companies, non-profits, and local marine and forest communities to protect and support sustainable development of Indonesia's natural environment and resources. Current projects in the Raja Ampat Islands are helping to maintain this MPA and creating opportunities to education and raise awareness of marine habitats and resources to local communities. In East Kalimantan, multiple programs are being implemented using REDD+ as a mechanism to encourage sustainable forest management, and protecting primates; a Kalimantan-wide survey is reaching out to villages to learn more about orangutan distribution and threats. http://www.nature.org/ourinitiatives/regions/asiaandthepacific/indonesia/index.htm

United Nations Development Programme (UNDP)

UNDP supports Indonesia in three key areas in its environment sector work, which include sustainable energy, sustainable natural resource management, and advocacy, policy support, and financial mechanisms on climate change.

In natural resource management, the Strengthening Community-Based Forest Watershed Management supports efforts in reducing land degradation and forest, and to restore watershed functions and ecosystem services. This project envisions scaling-up existing community-based forest and watershed management programs, and complements the government's work on rehabilitation of degraded forest and land in watersheds. Sites for this project span across the archipelagoes from Northern Sumatra to East Nusa Tenggara, and Central Sulawesi. http://www.undp.or.id/programme/environment/

United Nations Environment Programme (UNEP)

UNEP's Central Sulawesi has been the site for implementation of UN-REDD+ activities. The program developed a methodology for reference emission level, and a National Forest Inventory database was established. Other successful activities are drafting of policy recommendations on REDD+ communication strategy, training, and lessons learned from mapping payment mechanisms and benefit distribution systems. Additionally the UNEP is assisting Central Kalimantan to develop a roadmap for green growth focusing on forest and natural resources. UNEP is partnering with Indonesia on the Green Economy to conduct economic assessment of green investments in certain sectors. UNEP also is funding projects in Indonesia through the Global Environment Facility.

U.S. Fish & Wildlife Service

The U.S. Fish & Wildlife Service provides funds for species conservation. In Indonesia, the agency is helping protect and monitor Sumatran rhinoceros, leatherback turtle nesting sites, and the Asian elephant. http://www.fws.gov/

WALHI (Friends of the Earth Indonesia)

Friends of the Earth Indonesia is a non-profit network of organizations and individuals active in 28 provinces promoting environmentally sustainable development, resource use, and management. WALHI conducts advocacy and public outreach campaigns by gathering information on preservation of the environment from network members to distribute to the greater public. Priority issues include forest and plantation, energy, mines, climate justice, and coastal and marine. http://walhi.or.id/

World Bank

The World Bank is funding a number of projects in disaster management support of rural areas, climate change development policy, and conservation management of Aketajawa-Lolobata National Park in North Maluku. The financially largest project is the Indonesia Climate Change

Development Policy Project, which supports the Indonesian government's policy agenda on climate change. http://www.worldbank.org/en/country/indonesia/projects/all

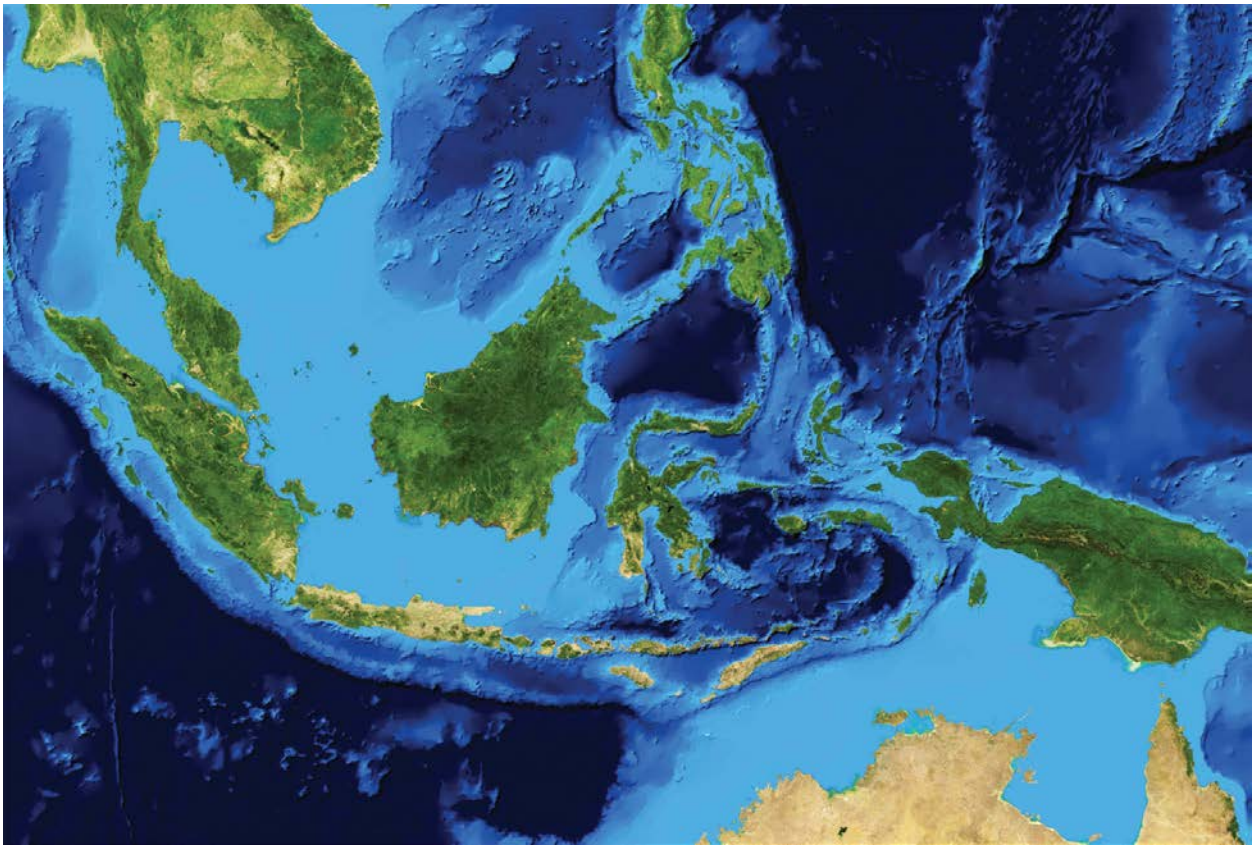
World Wildlife Fund (WWF) – Indonesia

WWF Indonesia has multiple programs in marine, species protection, forests, and climate change and energy. Since the 1960s, WWF-Indonesia has been working to save the Java and Sumatra rhinoceros and has expanded protection to the Sumatran tiger, elephant, orangutan, and marine turtles, critical species in Indonesia.

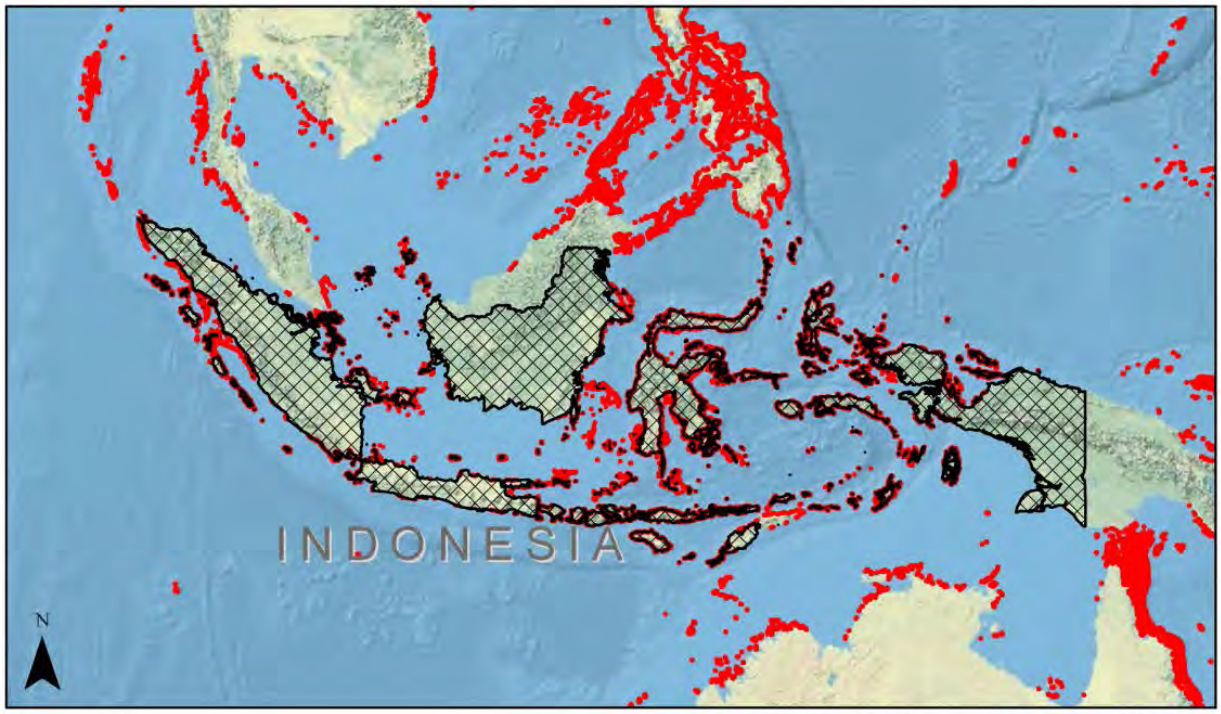
Under the forests program, WWF is working to reduce illegal logging, promote responsible management and certification of forests, and restore degraded forests. Focusing on the large palm oil and pulp wood industry, WWF is cooperating with companies and communities to promote smarter palm oil and pulp wood production, engaging the finance sector to prevent investment flows to companies with poor management practices, and increasing knowledge and awareness on issues of sustainability.
http://wwf.panda.org/who_we_are/wwf_offices/indonesia/wwf_indonesia_conservation/

ANNEX J. MAPS OF INDONESIA

Map 1. Map of Indonesia



Map 2. Coral Reefs of Indonesia

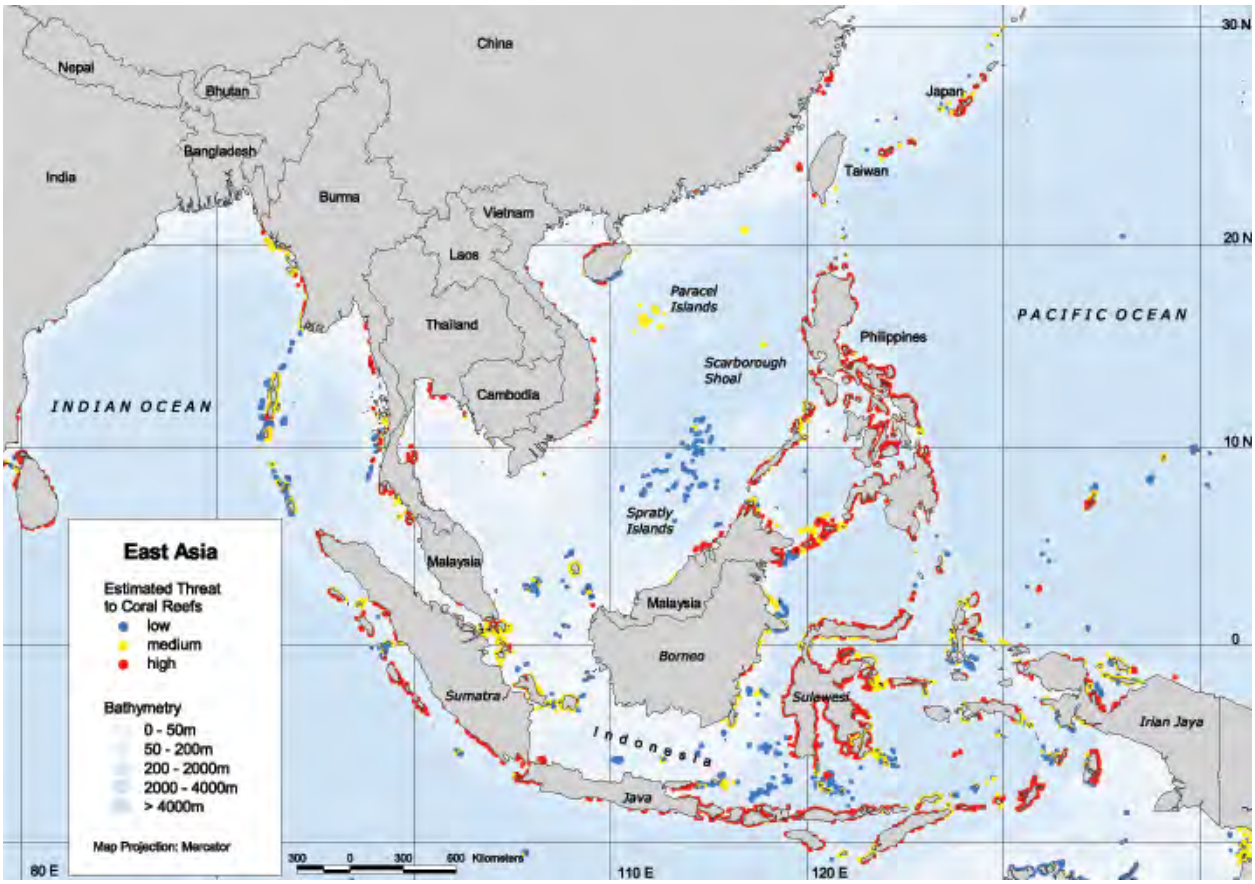


Legend

Coral Reefs

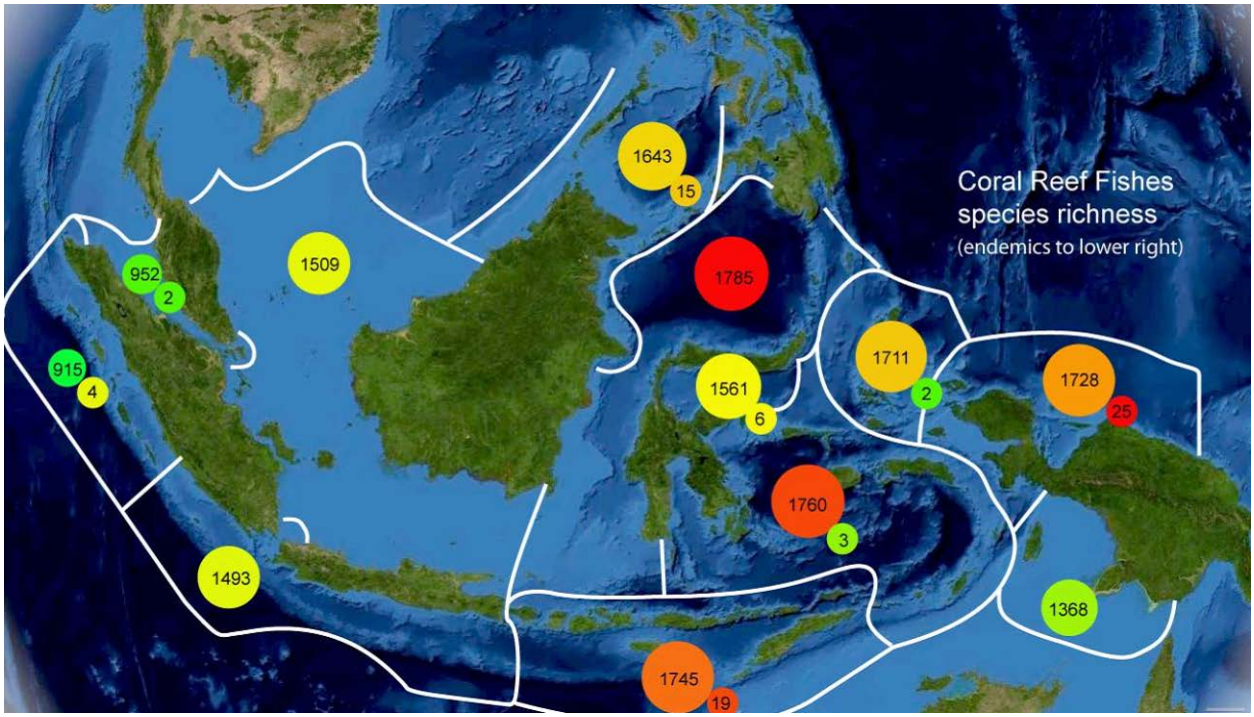
Source: Millennium Coral Reef Mapping Project validated maps provided by the Institute for Marine Remote Sensing, University of South Florida (IMaRS/USF) and Institut de Recherche pour le Développement (IRD, Centre de Nouméa), with support from NASA.

Map 3. Coral Reefs Threatened in East Asia (2008)



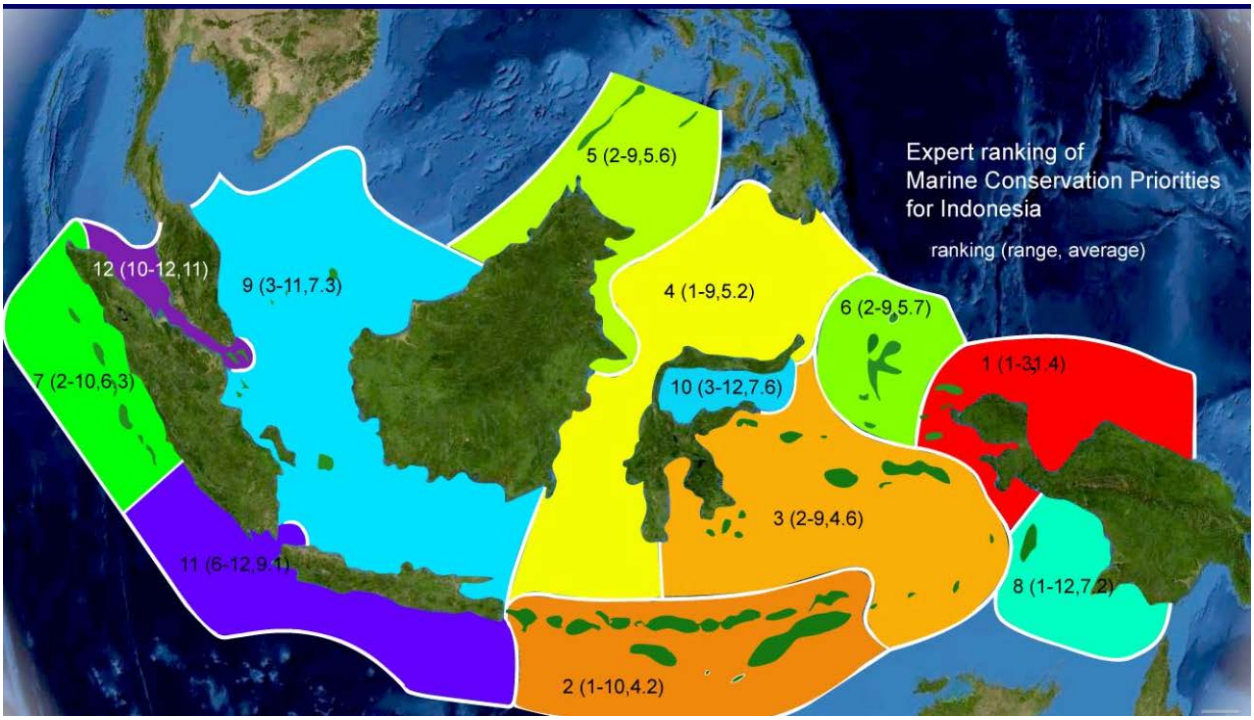
Source: WRI (2008)

Map 4. Coral Reef Species Richness and Endemics in Indonesia



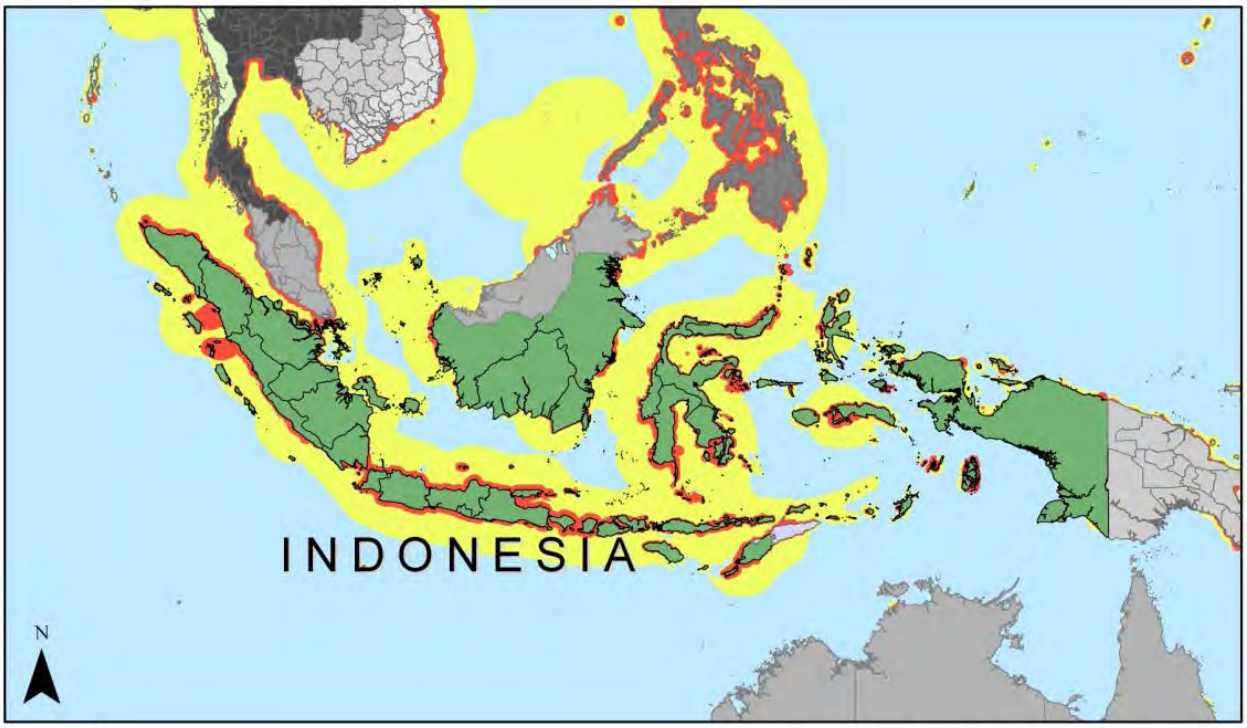
Source: Huffard et al. 2012

Map 5. Ranking of Marine Conservation Priorities for Indonesia



Source: Huffard et al. 2012

Map 6. Overfishing and Destructive Fishing



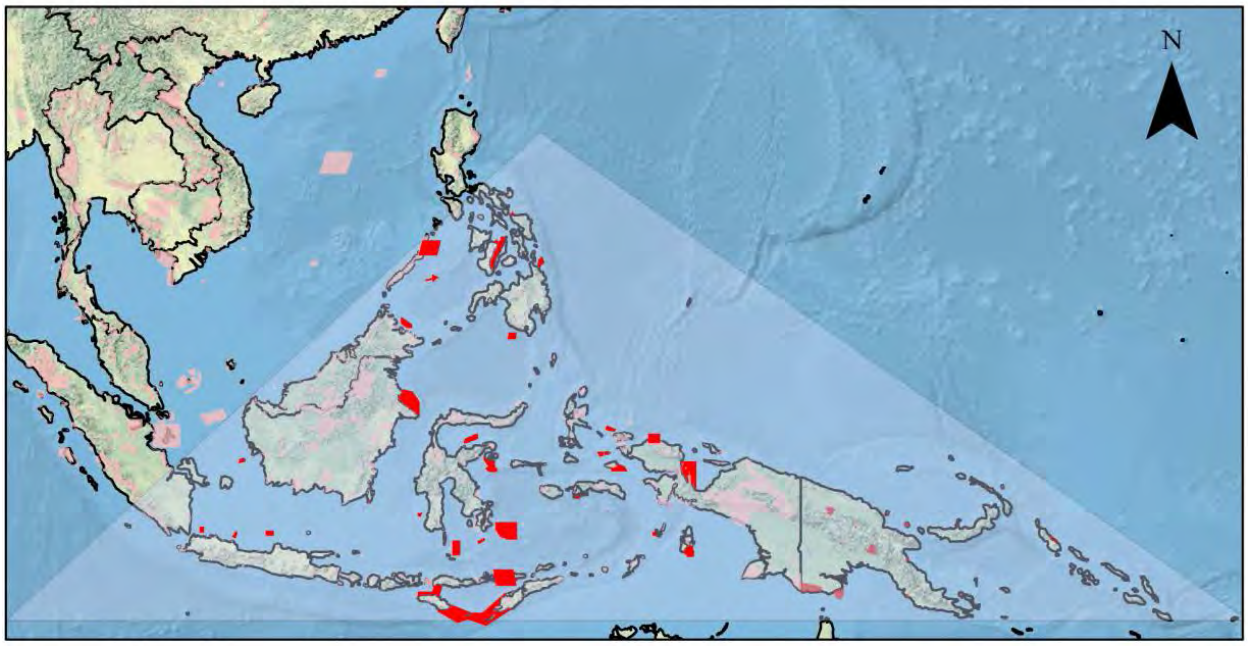
Legend

Threat level

- Low
- Medium
- High

Source: Burke, L., K. Reytar, M. Spalding, and A. Perry. Reefs at Risk Revisited. (Washington, DC, USA: World Resources Institute, 2011).

Map 7. Protected Areas of Indonesia



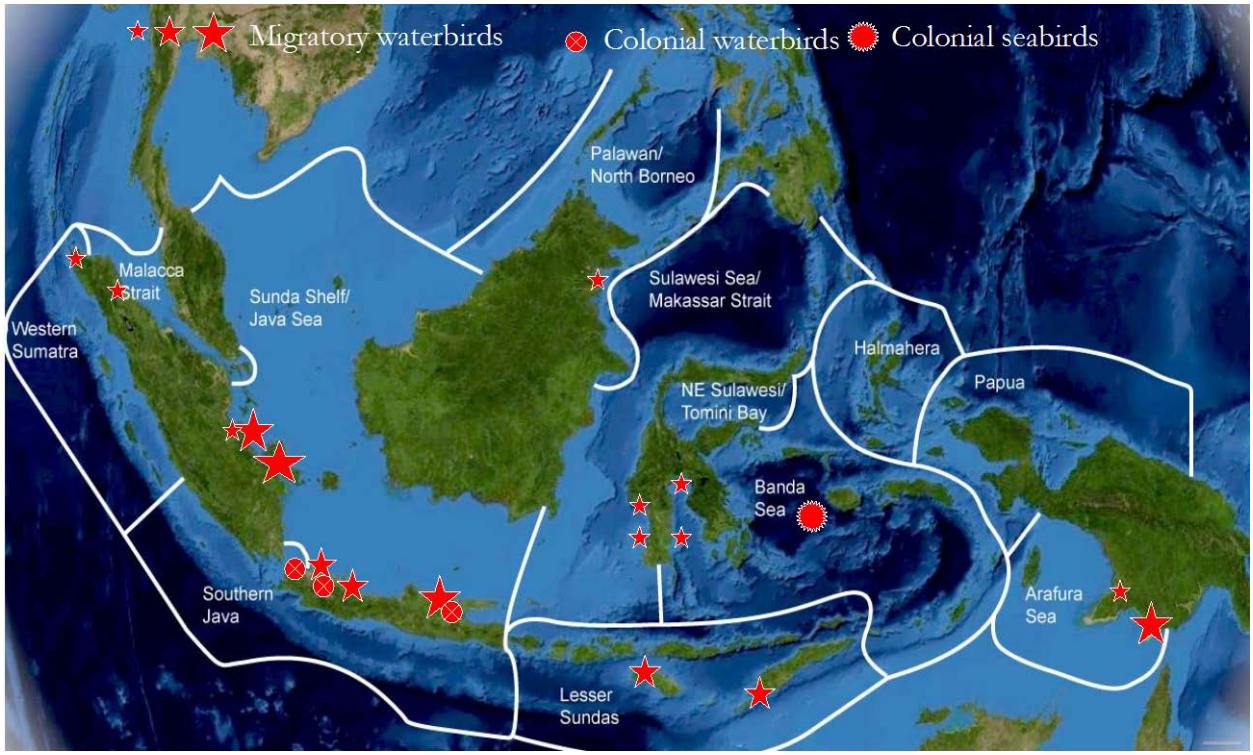
Legend

Marine Protected Areas within the Coral Triangle

Other Protected Areas

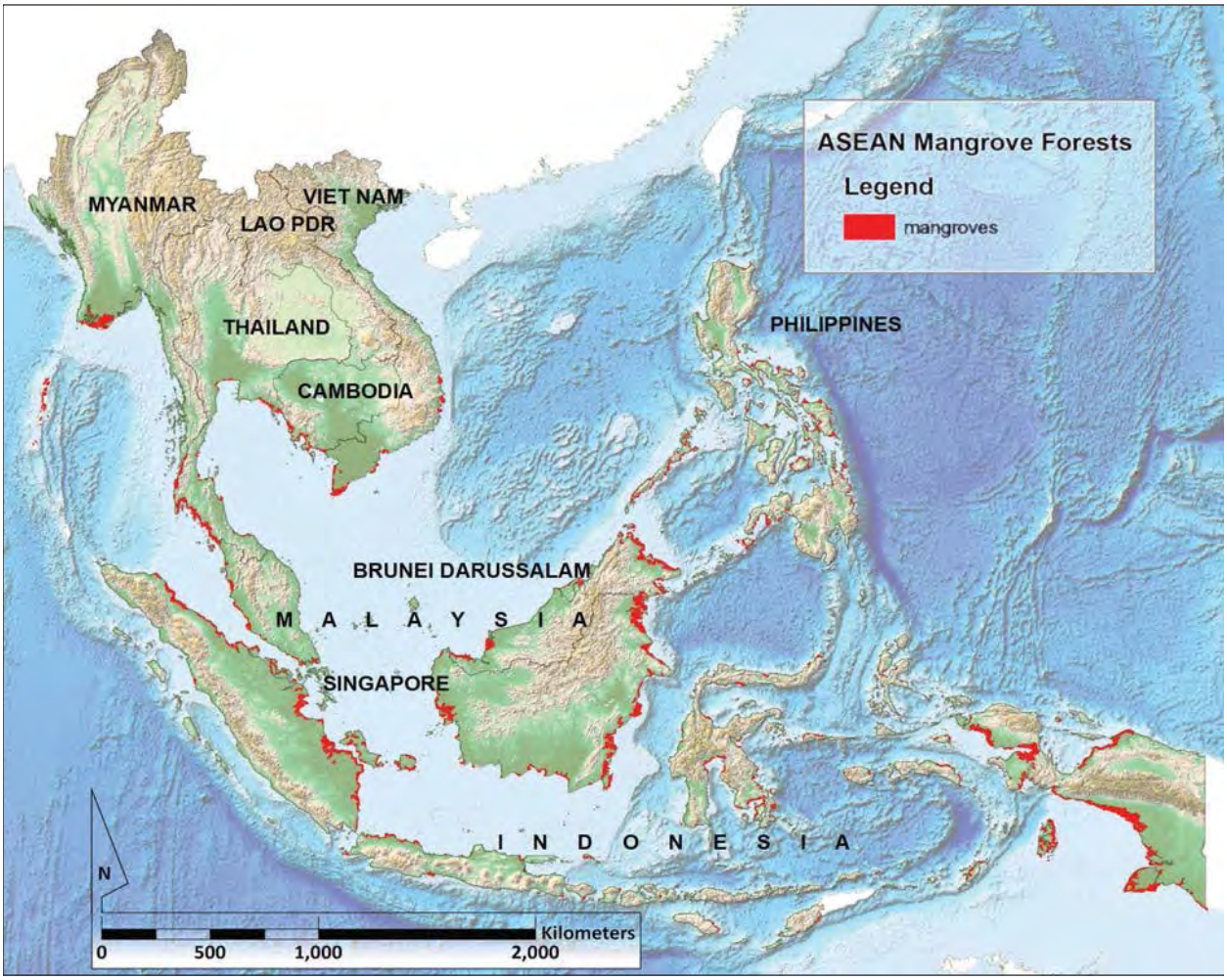
IUCN and UNEP. 2009. The World Database on Protected Areas (WDPA). UNEP-WCMC. Cambridge, UK.

Map 8. Important Coastal and Mangrove



Source: Huffard et al. 2012

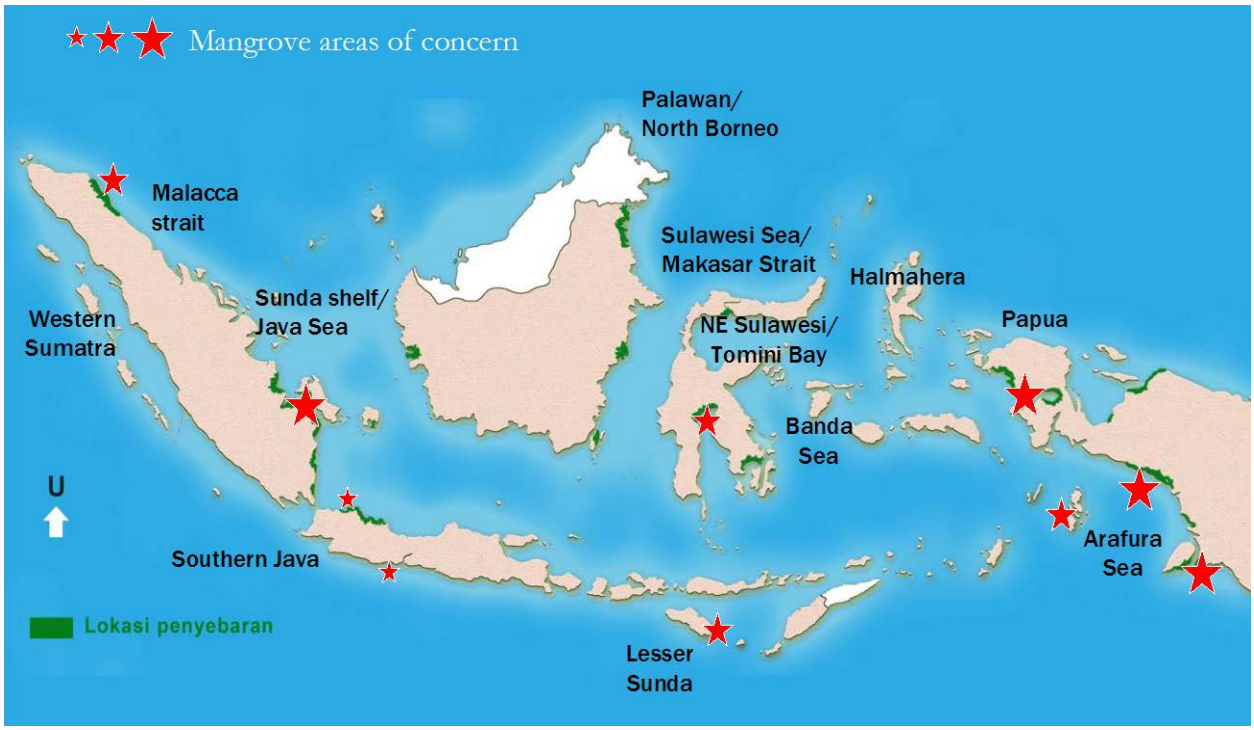
Map 9. Mangroves of Southeast Asia



Source: ASEAN 2011

Source: World Conservation Monitoring Center. Mangroves of the World data set. Relief: USGS GTOPO30
Note: Mangrove areas are enhanced for visibility. Data quality varies by country.

Map 10. Mangrove Areas of Concern in Indonesia



Source: Huffard et al. 2012

Map 11. Major Watersheds in Indonesia

Source: WEPA. 2012.

Map 12. Forest Cover in Indonesia

Basic Data of Forestry

Borders of Water Catchment Areas

- Borders of water catchment areas

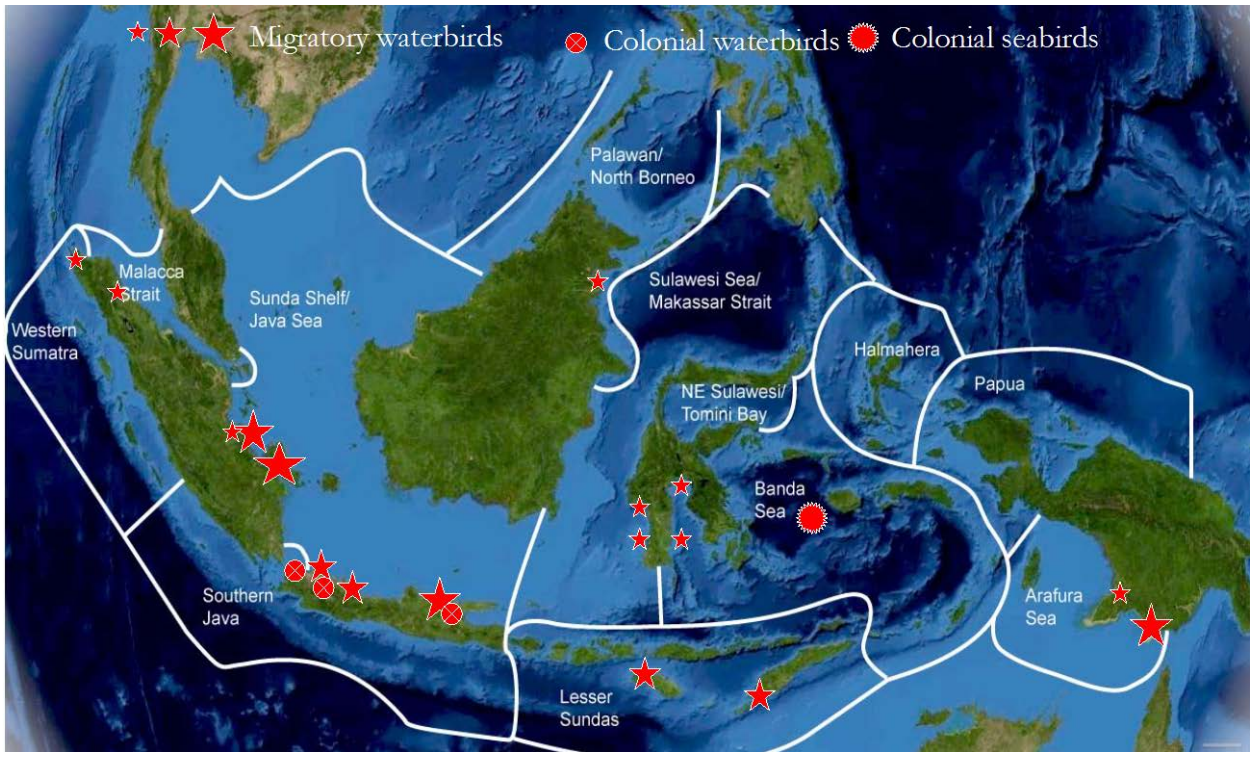
Forest Areas

- Nature reserve and conservation areas
- Marine protected area
- Protected forest
- Limited production forest
- Production forest
- Converted production forest
- Areas allocated for other non-forestry use

Forest Cover 2009

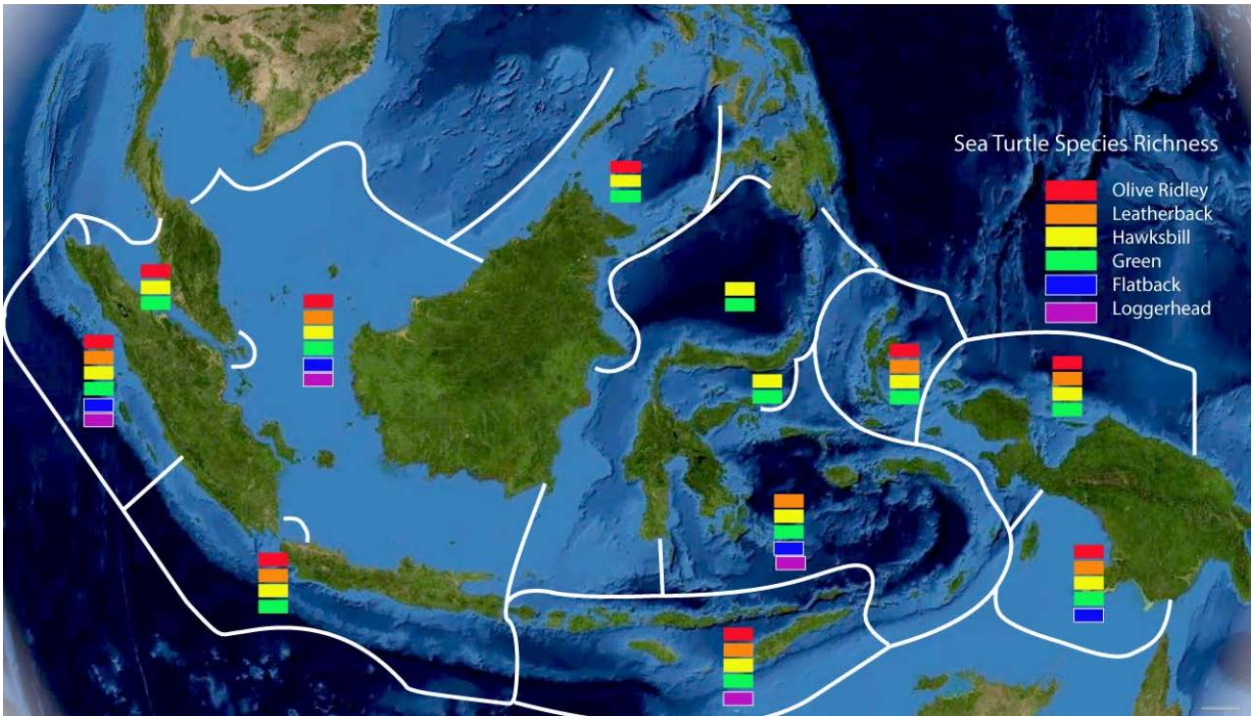
- Primary dryland forest
- Secondary dryland forest
- Primary swamp forest
- Secondary swamp forest
- Primary mangrove forest
- Secondary mangrove forest

Map 13. Important Coastal and Mangrove Avifauna Sites in Indonesia



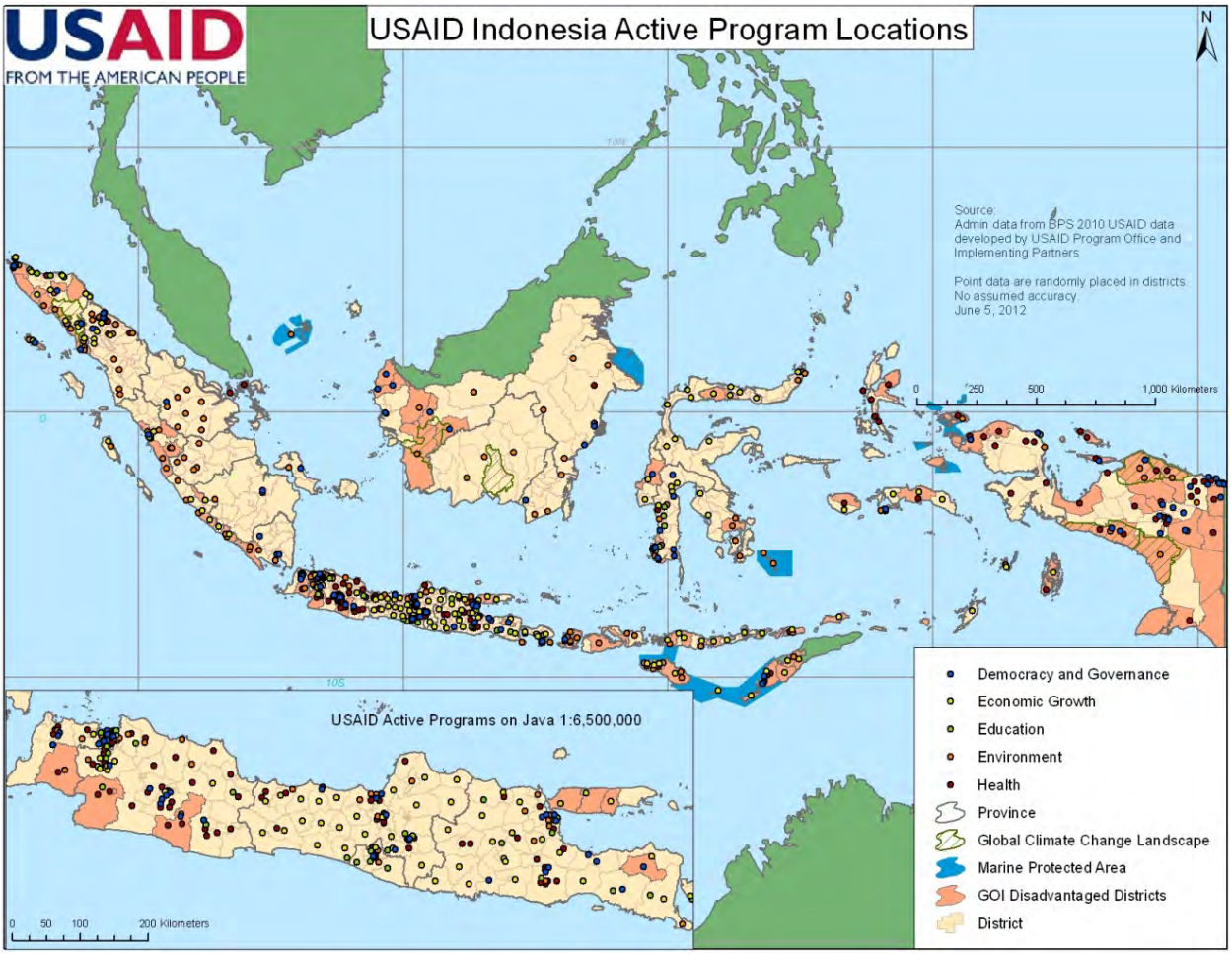
Source: Huffard et al. 2012

Map 14. Sea Turtle Species Richness in Indonesia

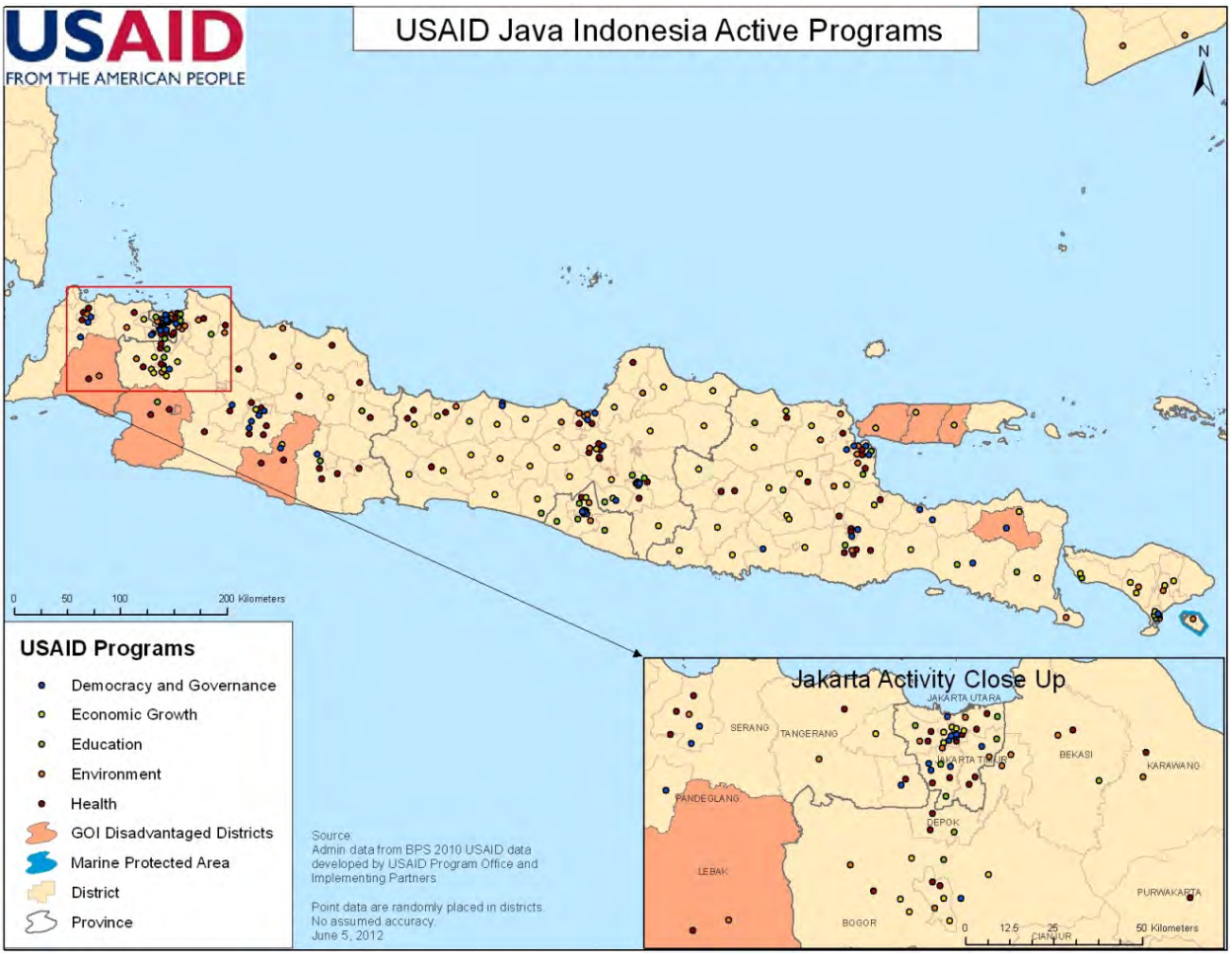


Source: Huffard et al. 2012

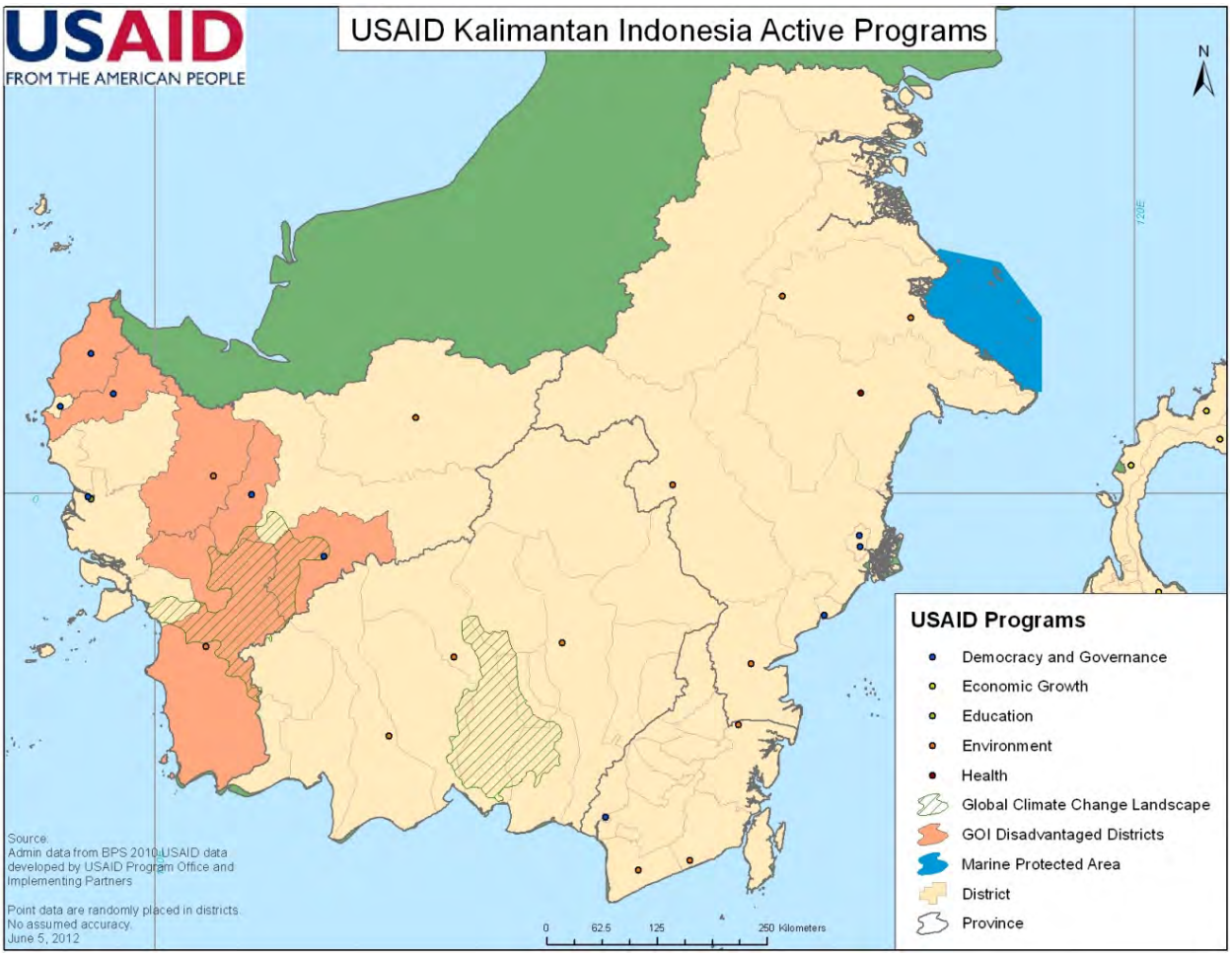
Map 15. USAID Indonesia Active Program Locations



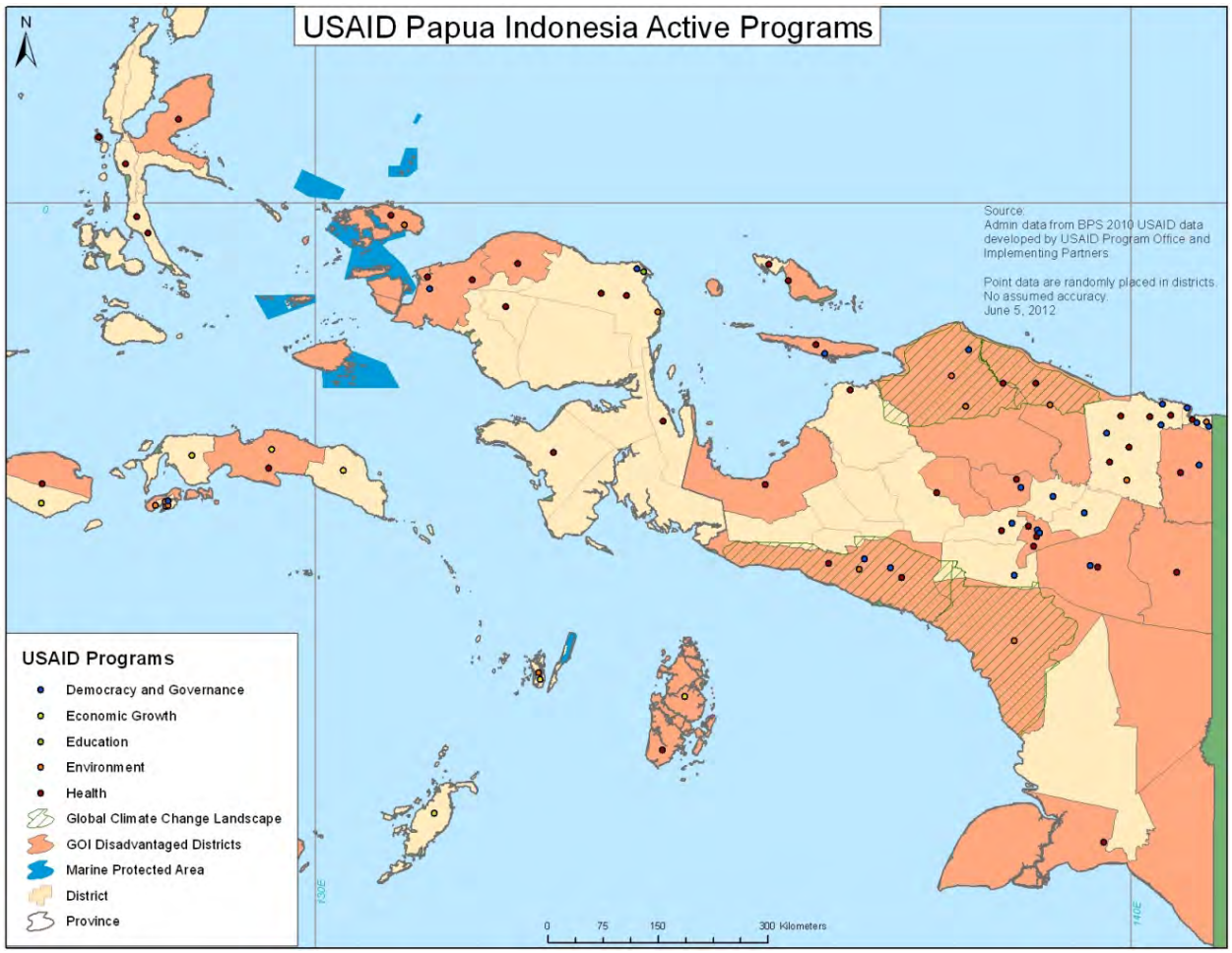
Map 16. USAID Java Indonesia Active Programs



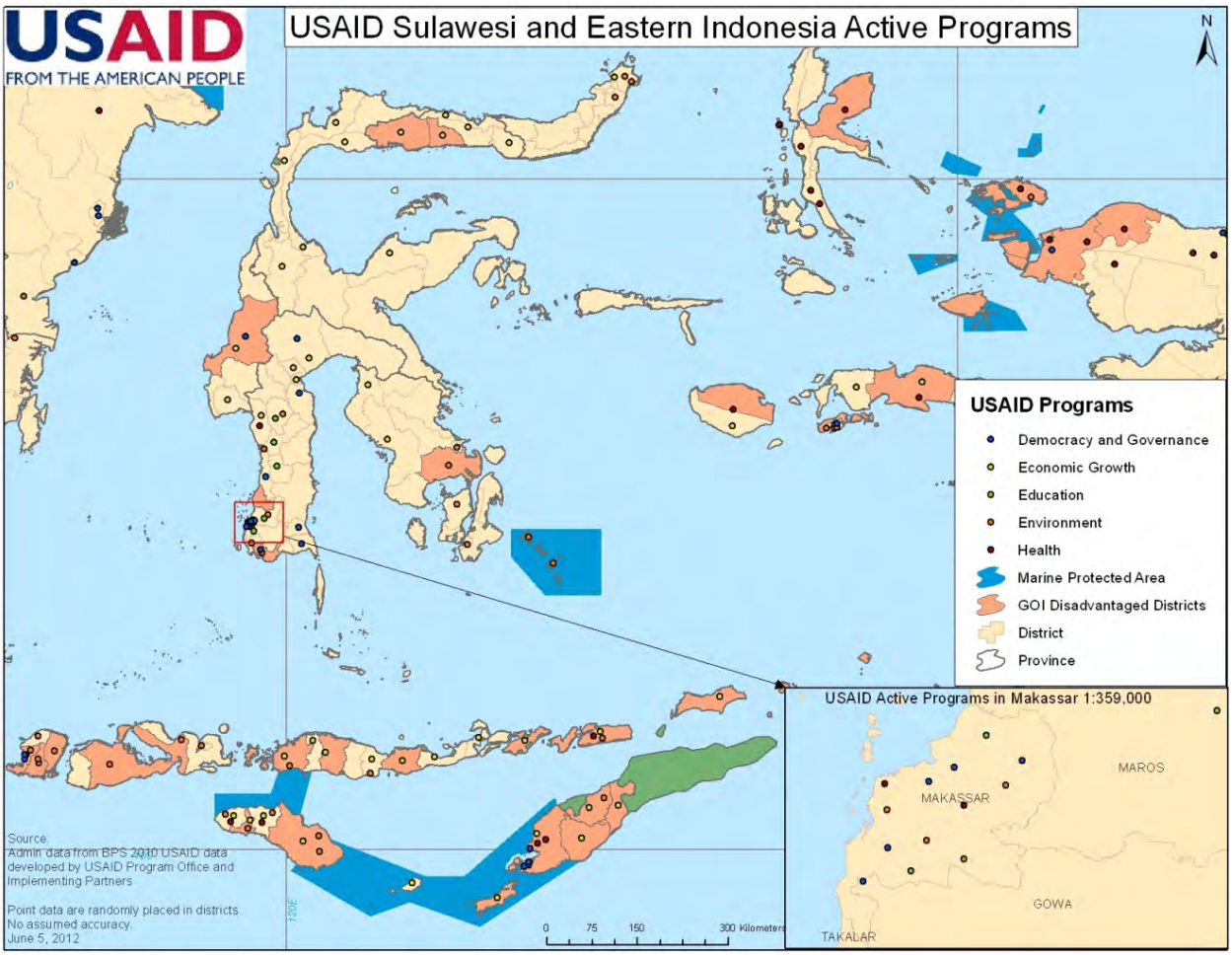
Map 17. USAID Kalimantan Indonesia Active Programs



Map 18. USAID Papua Indonesia Active Programs



Map 19. USAID Sulawesi and Eastern Indonesia Active Programs



Map 20. USAID Sumatera Indonesia Active Programs