

# ANNEX I.1 KEY COASTAL-MARINE POLICIES IN TIMOR-LESTE

Relevant coastal and marine conservation and management policies in Timor-Leste (as of September 2018)

Existing Coastal & Marine Policies & Plans	Responsible Ministry	Partner	Linkages to SDG 14	Status
Integrated Coastal Management				
National Strategic Development Plan (2011-2030)	All Ministries		national development priorities	Approved
National Oceans Policy (NOP)	MAF	PEMSEA	integrated oceans management	Draft (2017)
National Integrated Coastal Management Plan and Coastal Adaptation Strategy (2018)	MAF	UNDP	integrated coastal management, coastal adaptation, climate change impacts	Approved
National Coastal Vulnerability Assessment (2018)	MAF	UNDP	coastal vulnerability mapping & assessment	Approved
National Spatial Plan of Timor-Leste (2014)	MPV	Portugal	coastal spatial planning, infrastructure planning	Approved
Biodiversity Conservation				
National Biodiversity Strategy & Action Plan (2011-2020) (NBSAP)	MCIA	UNDP	coastal and marine biodiversity	Approved
TL Program of Works on Protected Areas (PoWPA) Strategic Action Plan (2011)	MAF	UNDP	national Protected Area Network (PAN), including Marine Protected Areas	Approved
National Ecological Gap Assessment (2010)	MAF	UNDP	national protected area gap analysis	Approved
Environmental Management				
Environmental Policy (2012)	MCIE		environmental management framework	Approved
National Adaptation Program of Action (NAPA) on Climate Change (2010)	MCIA	UNDP	climate change vulnerability, mitigation & adaptation	Approved
National Disaster Risk Management Policy (2008)	MSS		disaster risk management	Approved
Natural Resource Management				
MAF Strategic Action Plan (2014-2020)	MAF		MAF coordination, strategic priorities	Approved
Fish for Sustainability – Our Strategic Plan for Fisheries (2006-2016) (revised 'Fish for the Future 2001)	MAF		sustainable fisheries development	Approved
Timor-Leste National Aquaculture Development Strategy (NADS) (2012-2030)	MAF	NORAD-Worldfish	aquaculture planning & development	Approved
National Tourism Policy for Timor-Leste (2017)	MTAC	UNWTO	coastal & marine tourism development	Approved
National Water Supply Policy & National Terrestrial Water Resources Policy	MoPTC	AusAID, WaterAID	water resource management in coastal areas	Draft (2012)
National Action Program to Combat Land Degradation (2008)	MAF		coastal land degradation	Draft (2008)

# ANNEX I.2 MARINE & COASTAL LEGISLATION

## RELEVANT COASTAL AND MARINE LEGISLATION IN TIMOR-LESTE

Existing Legislation	Responsible Ministry	Potential linkages to SDG 14	Status
Constitution of RDTL, Article 6, 61 and 139	All Ministries	Prevent/protect destruction of environment & natural resources for the benefit of the human life	Approved
Decree Law No. 7/2002 on Maritime Boundaries of the Territory of the RDTL	MAF	Jurisdictional boundaries for marine and coastal zone management	Approved
Decree Law No. 3/2003 on the establishment of the Port Authority	MAF	IUU fishing, control of imports and exports of ozone depleting substances	Approved
Decree Law No. 5/2004 General Fisheries Regulations	MAF	Additional regulations for fisheries and aquaculture management	Approved (28 July 2004)
Decree Law No. 6/2004 General Bases of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture	MAF	General regulations to support management of fisheries and aquaculture	Approved (21 April 2004)
Decree Law No. 21/2008 Implementation of the Satellite System For Monitoring Fishing Vessels	MAF	Regulations for vessel monitoring systems (VMS) for fishing vessels.	Approved (25 June 2008)
Decree Law No. 5 /2011 on the Environmental Licensing	MCIA	Environmental licensing and also, environmental impact assessments (EIA) for large projects.	Approved (9 February 2011)
Decree Law No. 26/2012 on the Basic Environmental Law	MCIA	Protecting & preserving TL's environment	Approved (4 July 2012)
Decree Law on Pollution Control and Hazardous Waste	MCIA	Pollution control	Drafted
Degree Law No. on Biodiversity	MCIA	Defines national biodiversity policy, including protection and conservation of ecosystems, habitats and species, including endangered species.	<u>Drafted (circulated March 2012)</u>
Joint Ministerial Order No. 18/MAF/MCIA/II/2017 establishing the List of Protected Aquatic Species	MAF-MCIA	Establishes the List of Protected Aquatic Species in national maritime waters	Approved (12 April 2017)
Decree Law No 5/2016 establishing the National System of Protected Areas	MAF	Legislation to support a National System of Protected Areas – replaces UNTAET 19/2000 on Protected Places.	Approved (16 March 2016)
Decree No. 14/2017 establishing the Procedures for Submitting a Proposal for the Classification of Protected Area	MAF	Procedures for classification of protected areas	Approved (29 March 2017)
Decree Law No.33/2017 Legal Framework for Cultural Heritage	MTAC		Approved (6 June 2017)

## ANNEX I.3 MARINE ENVIRONMENTAL AGREEMENTS, FORUMS AND AREAS OF INTERNATIONAL COOPERATION IN TIMOR-LESTE

<b>Bilateral Partnerships</b>	<b>Responsible Ministry</b>	<b>Area of Cooperation</b>
Blue Ventures	MAF	conservation, MPAs, livelihoods
Conservation International-ADB	MAF	conservation, MPAs
WorldFish-NORAD-NZAID	MAF	fisheries, aquaculture (livelihoods)
KOICA	MAF	fisheries, aquaculture (training)
MMAF (Indonesia)	MAF	fisheries, aquaculture
JICA	MAF	watersheds, forestry
Mercy Corps-EU, Hivos	MAF	aquaculture, agriculture
<b>Regional Forums/Partnerships</b>		
PEMSEA (Partnerships in Environmental Management of the Seas of East Asia)	MAF	integrated coastal management
ATSEA (Arafura Timor Seas Ecosystem Action) Plan	MAF	sustainability, MPAs
CTI-CFF (Coral Triangle Initiative)	MAF	MPAs, conservation
SEAFDEC (Southeast Asia Fisheries Development Center)	MAF	fisheries
FAO Central (Rome) & FAO Regional (Bangkok)	MAF	fisheries, MPAs, coastal livelihoods
RPOA-IUU	MAF	combating IUU fishing
African, Caribbean & Pacific Group of States (ACP)	MAF	sustainable development, poverty reduction, greater integration into the world's economy
<b>International Agreements/Responsibilities</b>		
UN Convention on the Law of the Sea (UNCLOS)		maritime boundaries
UN Convention on Biological Diversity (CBD)	MCIA	biodiversity conservation, protected areas
UN Framework Convention on Climate Change (FCCC)	MCIA	climate change
Kyoto Protocol to the UNFCCC	MCIA	climate change
UN Convention to Combat Desertification (CCD)	MAF	land degradation
UN Convention on Land Degradation	MAF	land degradation
UNEP Convention of Migratory Species (CMS)	MAF	dugongs, seagrasses
<b>Potential or Pending</b>		
Secretariat of the Pacific Community (SPC)		observer
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)		combating trade in endangered species
RAMSAR Convention		wetlands of international importance
International Whaling Commission (IWC)		cetacean conservation and management
Nagoya Protocol		access to biodiversity genetic resources (observer)

## ANNEX 1.4 COASTAL AND MARINE ENVIRONMENTAL PROGRAMS IN TIMOR-LESTE

### Major Coastal and Marine Environmental Programs and Activities in Timor-Leste

Current GEF Major Programs, Partners, Activities Supporting EBM in Timor-Leste. [B=Biodiversity, LD=Land Degradation, CC=Climate Change, IW=International Waters ]

GEF ID	Title	Project Duration	GEF Focal Areas	Implementing Agency	Executing Agency	Type	GEF Grant (US\$)	Co-financing (US\$)	Status
National Projects									
9434	Securing the Long-term Conservation of Timor Leste Biodiversity and Ecosystem Services through the Establishment of a Functioning National Protected Area Network and the Improvement of Natural Resource Management in Priority Catchment Corridors	2018-2021	B, LD	CI	CI-Timor-Leste, MAF & MCIE	Full-size Project	3,340,367	12,292,000	Project Approved (2016)
	Conservation Agriculture, Permaculture and Sustainable Fisheries Management: Enhancing Food and Nutrition Security and Reducing Disaster Risk in Timor-Leste	2015-2018		FAO	CI-Timor-Leste		1,428,772		Project Approved (2015)
	Developing Small Island Management Approaches in the Sunda Banda Seascape <sup>##</sup>	2015–2018		CI-Timor Leste	Margaret Ann Cargill Foundation (MACF)		650,000		Status unknown.
9341	Strengthening Targeted National Capacities to Improve Decision-making and Mainstream Global Environmental Obligations into National Development Priorities	2018-2021		UNDP	MCIE	Medium-size Project	1,450,000	1,500,000	Project Approved (2016)

5671	Building Shoreline Resilience of Timor Leste to Protect Local Communities and their Livelihoods	2016-2019	CC	UNDP	UNDP	Full-size Project	7,000,000	31,644,402	Project Approved (2015)
							<b>13,869,139</b>	<b>45,436,402</b>	
	<b>Total</b>								
	<b>Regional/Global Projects</b>								
3591	PAS: Strengthening Coastal and Marine Resources Management in the Coral Triangle of the Pacific - under the Pacific Alliance for Sustainability Program (ADB CTP2 – Extension)	2016-2018	B, IW, CC	ADB	MAF / CI-Timor-Leste		689,078 (TL allocation)		Project Approved (2008)
6920	Implementation of the Arafura and Timor Seas Regional and National Strategic Action Programs	2017-2021	B, IW	UNDP	PEMSEA Resource Facility	Full-size Project	9,745,662 (2,120,000 to TL)	60,201,173	Project Approved (2015)
5768	Enabling Transboundary Cooperation for Sustainable Management of the Indonesian Seas	2016-2020	IW	FAO	MoMAF (Indonesia), MAF (Timor Leste)	Full-size Project	4,000,000	25,114,000	Project Approved (2014)
5405	EAS: Scaling up the Implementation of the Sustainable Development Strategy for the Seas of East Asia	2014-2018	IW	UNDP	PEMSEA	Full-size Project	10,643,992	157,265,467	Project Approved (2013)
4930	Enhancing the Conservation Effectiveness of Seagrass Ecosystems Supporting Globally Significant opulations of Dugong Across the Indian and Pacific Ocean Basins (Short Title: The Dugong and Seagrass Conservation Project)	2014-2018	B	UNDP	# CI-Timor-Leste, BV, MAF	Full-size Project	5,884,018 (829,353 to TL)	99,299,043	Project Approved (2012)

4936	EAS Reducing Pollution and Rebuilding Degraded Marine Resources in the East Asian Seas through Implementation of Intergovernmental Agreements and Catalyzed Investments (PROGRAM)		IW	UNDP	TBD	Full-size Project	0	0	Concept Approved (2013)
4623	Support to GEF Eligible Parties (LDCs and SIDS) for the Revision of the NBSAPs and Development of Fifth National Report to the CBD - Phase II	2012-2015	B	UNDP	National Government Ministries	Full-size Project	6,118,200	5,513,637	Completed (2015)
3647	CTI The Coral Triangle Initiative (PROGRAM)	2009-2014		ADB (lead), UNDP, FAO, World Bank	<sup>+</sup> Lead Government, Bilateral, & Inter-governmental Agencies; & NGOs	Full-size Project	72,545,000	398,862,500	Concept Proposed (2008)
3591	PAS: Strengthening Coastal and Marine Resources Management in the Coral Triangle of the Pacific - under the Pacific Alliance for Sustainability Program	2010-2015	B, IW, CC	ADB	*CTI NCCs MAF / FCG ANZDEC (Timor-Leste)	Full-size Project	13,118,183 (2,700,00 to TL)	23,849,000	Project Approved (2008)
3522	CTI Arafura and Timor Seas Ecosystem Action Programme (ATSEA) - under the Coral Triangle Initiative	2009-2013	IW	UNDP	@MoMAF (Indonesia), MAFF (Timor Leste), DEW (Australia), UNOPS	Full-size Project	2,500,000	6,248,047	Completed (2014)
2700	Implementation of Sustainable Development Strategy for the Seas of East Asia (SDS-SEA)	2007-2012	IW	UNDP	IMO, UNOPS	Full-size Project	10,876,336	33,374,400	Completed (2007)
	<b>Total</b>						<b>55,104,229</b>	<b>413,013,669</b>	

#Lead Executing Agency - Mohamed bin Zayed Species Conservation Fund; UNEP/CMS Dugong MoU Secretariat provides technical oversight of project. Technical Partners: UNEP/CMS Dugong MoU Secretariat & its Technical Advisory Team, UNEP-DEPI, Blue Ventures, GRID-arendal and Forest Trends. Key National Partner in Timor Leste - Ministry of Agriculture and Fisheries (MAF).

<sup>†</sup>Lead Government agencies in each country: Bilateral Development Assistance Agencies; Inter-governmental Agencies; and Nongovernmental Organizations (NGOs). CTTI National Coordinating Committees (NCCs) of Governments of Papua New Guinea, Solomon Islands, and Timor Leste, plus Governments of Fiji and Vanuatu.

@Ministry of Marine Affairs and Fisheries, Indonesia (BRKP), in cooperation with Ministry of Agriculture, Fisheries and Forestry (MAFF) (Timor Leste), Department of Environment and Water Resources (DEW) (Australia) in collaboration with UNOPS.

\*\*CEPF (Critical Ecosystem Partnership Fund). CEPF is a joint initiative of l'Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility (GEF), the Government of Japan, the MacArthur Foundation and the World Bank.

# Funding under the Margaret Ann Cargill Foundation (MACF)is to support the establishment of a Nino Konis Santana National Park Steering Committee and also, the preparation of a NKS management plan. Status of project unknown.

\*\* Conservation International, through its program office in Timor-Leste, is providing training in applied biodiversity science to government counterparts in the Ministry of Agriculture and Fisheries and community and NGO partners, leading rapid biological surveys of three protected areas (Mt. Maurei, Mt. Legumau, and Mt.

Fatumasin), and preparing a protected area management plan in Mt. Maurei. This grant leads into a much larger GEF-funded program (GEF ID. 9434) to strengthen the protected area network of Timor-Leste.

## ANNEX 2.1 CONSERVATION TARGETS IN TIMOR-LESTE

### CURRENT CONSERVATION AND ENVIRONMENTAL TARGETS IN TIMOR-LESTE (NEGA 2011, NBSAP 2011, SDP 2013)

Protected Area Targets - National Ecological Gap Assessment (2011)
<b>Marine, Aquatic and Coastal Ecosystems Targets</b>
<ul style="list-style-type: none"> <li>• Maintain / restore 50% habitat connectivity within and around marine protected areas</li> <li>• A minimum of 50% of the current extent of estuaries to be protected</li> <li>• 30% of the distribution of rivers and lakes are in PAs.</li> <li>• 50% of critical habitats for marine threatened species to be captured in a protected area</li> <li>• 100% fish spawning areas protected</li> <li>• 80% of mangrove areas protected</li> <li>• 30% of each coral reef type in MPAs</li> <li>• 30% for seagrass habitats in MPA's</li> <li>• 50% of the known range of marine endemic species to be captured in MPAs</li> <li>• 80% of the current distribution of mangroves to be protected in PAs based on securing the Carbon of these mangroves</li> </ul>
<b>Terrestrial Ecosystems Targets</b>
<ul style="list-style-type: none"> <li>• Ensure a minimum of 30% of the original extent for each major vegetation type to be placed in protected areas</li> <li>• Maintain / restore 100% habitat connectivity within and around terrestrial protected areas</li> <li>• Capture 100% of the critical habitats for threatened terrestrial species to be captured in a protected area</li> <li>• A minimum of 30% of the distribution of each known taxa to be within a protected area</li> <li>• 100% of the known range of terrestrial endemic species to be captured in protected areas</li> <li>• 100% of the known range of terrestrial migratory species to be captured in a protected area</li> <li>• 50% of the known range of marine migratory species to be captured in protected areas</li> <li>• 30% of the nation's sequestered carbon found in living terrestrial vegetation is captured inside protected areas.</li> <li>• Ensure that protected areas are as large as they can possibly be</li> <li>• Ensure that protected areas are connected to one another especially along elevation gradients for terrestrial protected areas</li> <li>• Ensure climate refugia are protected especially in areas representative of major geological features in the protected area system</li> </ul>

**Table A2.1.1** National protected area and biodiversity targets recommended in NEGA Report (from NBSAP 2011).



Biodiversity Targets - National Biodiversity Strategy & Action Plan (2011-2020)
<p><b>By 2015:</b>  <b>Priority Strategy 2: Protecting biodiversity and promoting sustainable use</b></p> <p>Target: By 2015, rehabilitation activities in critical watersheds and degraded lands have been undertaken and at least one million trees have been planted per year, and sustainable livelihoods have been provided to local communities through ecosystem restoration activities</p> <ul style="list-style-type: none"> <li>• Enhance and develop national biodiversity laws and relevant environmental policies on nature conservation, pollution and other related concerns, including traditional laws</li> <li>• Intensively rehabilitate critical and damaged habitats and ecosystems and degraded watersheds through massive tree planting, including mangroves reforestation</li> </ul>
<p><b>By 2020:</b>  <b>Priority Strategy 3: Building climate-resilient ecosystems through effectively managing protected areas and reducing threats to biodiversity</b></p> <p>Target: By 2020, the status of biodiversity has improved through the safeguarding of ecosystems, species and genetic diversity in the 30 declared protected areas</p> <ul style="list-style-type: none"> <li>• Effectively manage representative samples of Timor-Leste's biodiversity in the 30 declared protected areas and create natural conservation zones to protect specific biodiversity and ecosystems</li> <li>• Develop and implement a comprehensive and integrated coastal and marine policy and fisheries management programme</li> </ul> <p><b>Priority Strategy 4: Enhancing biodiversity and ecosystems services to ensure benefits to all</b></p> <p>Target: By 2020, ecosystem services have been enhanced through promoting economic values of biodiversity and ecosystems and promoting benefits sharing</p> <ul style="list-style-type: none"> <li>• Value and account direct and indirect goods and services of biodiversity and ecosystems</li> <li>• Safeguard and maintain ecosystems services through promoting Integrated Water Resource Management</li> </ul>

**Table A2.1.2.** Relevant environmental and conservation targets under NBSAP 2011-2020.

Environmental & Conservation Targets - Timor Leste Strategic Development Plan (2011-2030)
<p><b>By 2015:</b></p> <ul style="list-style-type: none"> <li>- Publication of the Law on Environment, which is the legal framework for the environment protection and conservation.</li> <li>- Publication of legislation for the forest protection.</li> <li>- Constitution of the National Authority designated for the Mechanisms of the Kyoto Protocol and the National Climate Change Centre</li> <li>- Establishment of community plant nurseries</li> <li>- Afforestation Operations - planting 1,000,000 trees / year</li> <li>- Publication of the National Law on Biodiversity</li> <li>- Publication of the Law on Wildlife Conservation</li> <li>- Publication of regulations on air, noise, soil pollution and gas emissions per vehicle</li> <li>- Definition of the forest protection programs and measures to combat fire</li> <li>- Promoting awareness and environmental education</li> </ul>
<p><b>By 2020:</b></p> <ul style="list-style-type: none"> <li>- Achieving 70% of the measures contemplated by the National Program of Climate Change Adaptation</li> <li>- 100% of families in Dili replaced wood as a source of energy for cooking</li> </ul>
<p><b>By 2030:</b></p> <ul style="list-style-type: none"> <li>- Network of terrestrial and marine protected area, implemented ensuring the integrated management of representative biodiversity areas of Timor-Leste</li> </ul>

**Table A2.1.3.** Environmental and conservation targets under the SDP 2011-2030.

## ANNEX 2.2 PROPOSED TL PROTECTED AREA NETWORK (PAN)

### LIST OF 30 PROTECTED AREAS UNDER PROPOSED PAN (FROM NEGA 2011)

Name of Protected Area	Land / Sea
1. Atauro (marine)	Marine
2. Behau (marine)	Marine
3. Nino Konis Santana National Park (marine)	Marine
4. Lamsanak (marine)	Marine
5. Mount of Cblaque & Lake of Welenas*	Terrestrial
6. Mount of Tapo/Saburai*	Terrestrial
7. Mount of Loelako*	Terrestrial
8. Mount of Taroman*	Terrestrial
9. Mount of Kuri*	Terrestrial
10. Mount of Laretame*	Terrestrial
11. Mount of Builo*	Terrestrial
12. Mount of Guguleur*	Terrestrial
13. Lake of Maurei*	Terrestrial
14. Mount of Mundo Perdido*	Terrestrial
15. Area Protegida Reserva De Tilomar	Terrestrial
16. Mount Tatamailau & Talobu/Laumeta	Terrestrial
17. Manucoco Protected Area	Terrestrial
18. Ribeira de Clere & Lake of Modomahut*	Terrestrial
19. Mount of Matebian	Terrestrial
20. Mount of Fatumasin	Terrestrial
21. Mount Cutete*	Terrestrial
22. Mount Manoleu* & Area Mangal Citrana	Terrestrial
23. Mount of Burabo*	Terrestrial
24. Cristo Rei Protected Area	Terrestrial
25. Mount Legumau*	Terrestrial
26. Mount of Aitana*	Terrestrial
27. Mount of Bibileo*	Terrestrial
28. Nino Konis Santana National Park	Terrestrial
29. New Diatuto	Terrestrial
30. Tasitolu	Terrestrial

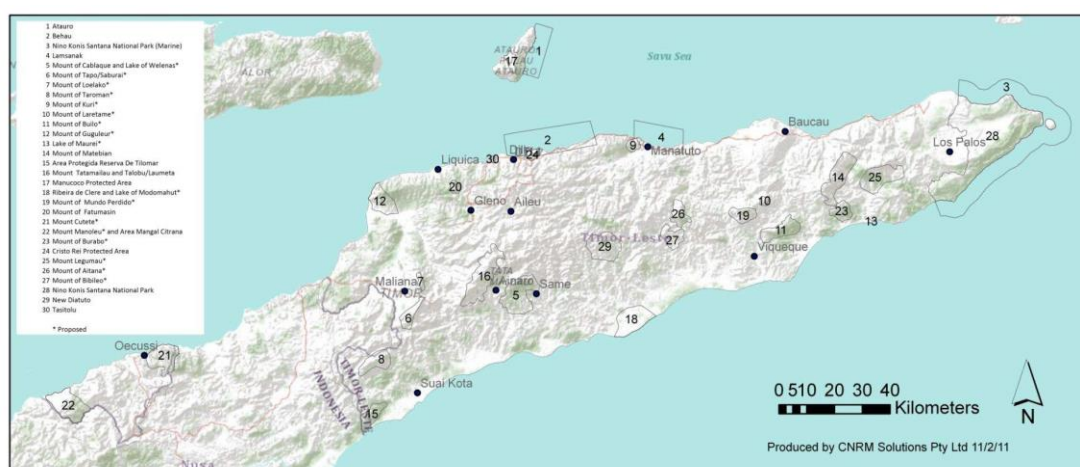
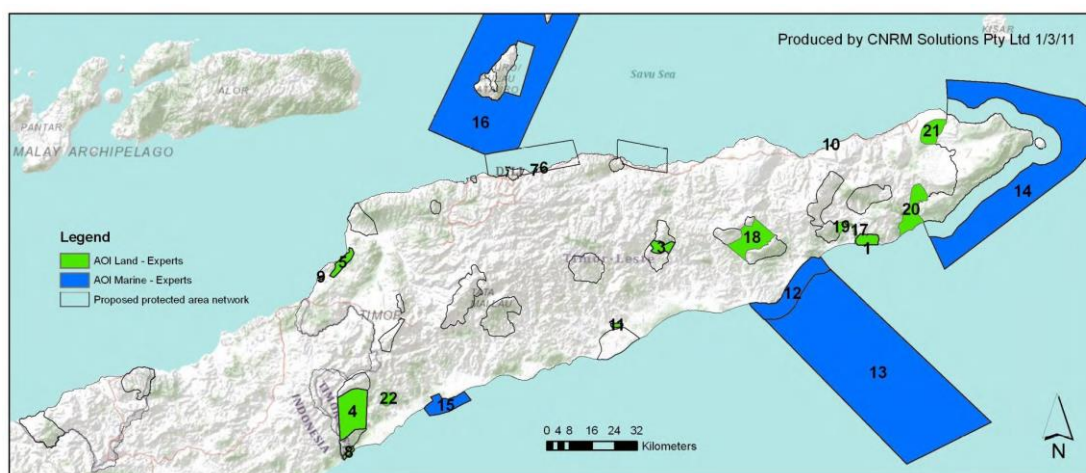


Figure A2.2.1. Proposed Protected Areas Network (PAN) for Timor Leste (Grantham et al. 2011).



**Figure A2.2.2.** The spatial location of 22 areas of interest (AOI's) identified by expert opinion in Timor-Leste. More detailed images of each AOI are given in Appendix 3 (from Grantham et al. 2011).

AOI	Reasons
1	Important Wetland
2	Intact Forest / threatened species (e.g. Yellow Cockatoo)
3	Connectivity
4	Connectivity
5	Intact Forest
6	Important Mangroves
7	Important Mangroves
8	Important Coastal Forest / coral reefs
9	Important Estuary
10	Important Wetland
11	Important Wetland
12	Important Marine Area
13	Important Marine Area
14	Important Marine Area
15	Important Marine Area
16	Important Marine Area
17	Important Marine Area
18	Connectivity
19	Connectivity
20	Connectivity
21	Connectivity
22	Connectivity

**Table A2.2.1.** Rationale for selection of the 22 Areas of Interest (AOI) identified in the PAN (from NEGA 2011).

## ANNEX 2.3 GAZETTED PROTECTED AREAS IN TIMOR-LESTE

### GAZETTED PROTECTED AREAS IN TIMOR-LESTE

No.	Protected Area	Municipality	Post Administrative	Area Estimates (ha)
1.	Parque Nacional Nino Konis Santana	Lautem	Tutuala, Lospalos, Lautem/Moro	123,600
2.	Monte Legumau	Lautem, Baucau	Luro, Laga, Laga Baguia	35,967
3.	Lago Maurei	Lautem, Viqueque	Iliomar, Uato Carbau	500
4.	Be Matan Irabere	Viqueque	Uato Carbau	
5.	Monte Matebian	Baucau, Viqueque	Quelica, Laga, Baguia, Uato Lari, Uato Carbau	24,000
6.	Monte Mundo Perdido	Viqueque	Osso	25,000
7.	Monte Laretame	Viqueque, Baucau	Osso, Venilale	16,429
8.	Monte Builo	Viqueque	Osso, Uato Lari	8,000
9.	Monte Burabo	Viqueque	Uato Carbau	18,500
10.	Monte Aitana	Viqueque	Lakluta	17,000
11.	Monte Bibileo	Manatuto, Viqueque	Laleia, Lakluta	19,000
12.	Monte Diatuto	Manatuto	Soibada, Laclubar	15,000
13.	Monte Kuri	Manatuto	Laclo	
14.	Parque Nacional Kay Rala Xamana Gusmao	Manufahi, Ainaro	Same, Ainaro	18,000
15.	Ribeira De Clere	Manufahi	Fatuberliu	30,000
16.	Lagoa Modomahut	Manufahi	Fatuberliu	22
17.	Lagoa Welenas	Manufahi	Fatuberliu	20
18.	Monte Manucoco	Dili	Atauro	4,000
19.	Cristo Rei	Dili	Cristo Rei	1,558
20.	Lagoa Tasitolu	Dili	Dom Aleixo	
21.	Monte Fatumasin	Liquiça	Bazartete	4,000
22.	Monte Guguleur	Liquiça	Maubara	13,159
23.	Lagoa Maubara	Liquiça	Maubara	
24.	Monte Tatamailau	Ainaro, Ermera	Hatobuilico, Ainaro, Letefoho, Atsabe	20,000
25.	Monte Talobu /Laumeta	Ainaro	Ainaro	15,000

No.	Protected Area	Municipality	Post Administrative	Area Estimates (ha)
26.	Monte Loelako	Bobonaro, Ermera	Bobonaro, Maliana, Cailaco, Atsabe	4,700
27.	Monte Tapo/Saburai	Bobonaro	Lolotoe, Bobonaro, Maliana	5,000
28.	Lagoa Be Malae	Bobonaro	Balibo	??
29.	Korluli	Bobonaro	Maliana, Cailaco	??
30.	Monte Lakus/Sabi	Bobonaro	Lolotoe	??
31.	Monte Taroman	Covalima	Fatululik, Fohorem	19,155
32.	Reserva Tilomar	Covalima	Tilomar	7,000
33.	Cutete	Oecusse	Pante Makassar	13,300
34.	Monte Manoleu	Oecusse	Nitibe	20,000
35.	Area Mangal Citrana	Oecusse	Nitibe	1,000
36.	Oebatan	Oecusse	Nitibe	400
37.	Ek Oni	Oecusse	Nitibe	700
38.	Us Metan	Oecusse	Pantai Makasar	200
39.	Makfahik	Manatuto	Barique	??
40.	Area Mangal Metinaro	Dili		??
41.	Area Mangal Hera	Dili	Cristo Rei	??
42.	Lagoa Hasan Foun & Onu Bot	Covalima	Tilomar	12
43.	Lagoa Bikan Tidi	Ainaro	Leolima	110
44.	Samik Saron	Manatuto	Barique, Soibada Laclubar	??
<b>Total (Terrestrial)</b>				
45.	Reserva Natural Aquatica	Bobonaro	Balibo	11,259
46.	Reserva Natural Aquatica	Dili	Atauro	5,085
<b>Total (Aquatic Natural Reserves)</b>				<b>16,344</b>
<b>Total (Terrestrial &amp; Marine) (ha)</b>				<b>460,910</b>

**Note :** 80,742 ha of the total of 460,910 ha are still estimates for new Protected Area proposals.  
Parque Nacional Nino Konis Santana (123,600ha) includes 55,600 ha of marine waters.

**Table A2.3.1.** Protected Areas (marine and terrestrial) gazetted under Decree Law 5/2016 National System of Protected Areas (enacted 16 March 2016). [Note: LMMAs/MPAs are currently being progressed for several of these protected areas. See Annex 2.8.]

## ANNEX 2.4 NATIONAL PLAN OF ACTION FOR THE CORAL TRIANGLE INITIATIVE

**Table A2.4.1.** Goals, targets and activities proposed for Timor Leste (2009-2014), under the National Plan of Action for the Coral Triangle Initiative (2009).

CTI Goals	Targets	Activities
Goal 1 – Priority Coastal and Marine Areas Designated and Effectively Managed	Target #1: "Priority Areas" designated, with investment plans completed and sequenced.	<p>1.1 By Q2 of 2011 Timor-Leste will finalize rapid assessment and mapping of marine resources (coral reef, mangroves, seagrass, etc.) to define and identify coastal and marine priority areas<sup>1</sup>;</p> <p>1.2 Timor-Leste will facilitate the incorporation of the CTI results into other key Programs such as the National Biodiversity Action Plan (NBSAP), National Adaptation Plan of Action (NAPA), PoWPA (Program of Works on Protected areas)<sup>2</sup>;</p> <p>1.3 By Q3 2011 Timor-Leste will complete its measurements of pelagic and benthic primary production and respiration and finalize its estimation of ecosystem production for the South coast<sup>3</sup>;</p> <p>1.4 By Q3 2011 Timor-Leste will complete a study for sedimentation rates and changes in sedimentation rates in catchments in the South Coast (?) and propose improvements to current management practices;</p> <p>1.5 By Q4 of 2014 Timor-Leste will have strengthened its laws and regulations providing the required enabling environment for coastal and marine spatial planning and management of coastal and marine priority areas to occur<sup>4</sup>;</p> <p>1.6 By Q4 2013 Timor-Leste will have generated an all-inclusive, multi-sector investment program for Timor-Leste's priority marine and coastal areas.</p>
	Target #2: Marine and coastal resources within selected priority areas are sustainably managed using Integrated Coastal Management approach.	<p>1.2.1 By Q4 of 2013, Timor Leste will complete the development of coastal-marine spatial planning for selected priority management areas<sup>5</sup>;</p> <p>1.2.2 By Q4 of 2014, Timor Leste will start implementing integrated coastal-marine spatial plan for priority management area (Jaku Island – Lore Forest; Ataúru Island; Batugade).</p>
Goal 2 – Ecosystem Approach To Fisheries Management	Target #1: Generate and consolidate data management systems and procedures to enable adequate management of coastal resources.	<p>2.1 By Q3 2011 Timor-Leste will finalize study on fish-stock assessment as a basis for Total Allowable Catch and fisheries licensing system;</p> <p>2.2 By Q4 2014 Timor-Leste will finalize and implement fisheries recording and reporting system to strengthen national fisheries statistics;</p> <p>2.3 By Q4 of 2013 Timor-Leste will finalize draft National Legislation on marine resource conservation;</p> <p>2.4 By Q4 of 2012 Timor-Leste will enforce all existing laws and regulations of particular importance to achieving EAFM and ICM<sup>7</sup>.</p>
	Target #2: Support sustainable alternative livelihoods and Food Security programs for communities in Coastal Communities through Poverty Reduction Initiatives that take into account EAFM and ICM.	<p>2.2.1 By Q4 of 2010, Timor-Leste will finalize a rapid assessment study to identify and map fish production and poverty areas in the coastal zones;</p> <p>2.2.2 By Q2 2012 Timor-Leste will finalize an in depth national census to better understand to role of fisheries in coastal communities livelihoods;</p> <p>2.2.3 By Q4 of 2010 Timor Leste will start implementing community-based fisheries management scheme in selected priority areas;</p> <p>2.2.4 By Q4 of 2014 Timor-Leste will have developed a Aquaculture Development plan that will become a part of Timor-Leste's coming National Development/Strategic Plan;</p> <p>2.2.5 By Q4 of 2014 Timor-Leste will develop alternative income generating package program, including capacity building and support for the small-scale enterprise at the community level (e.g., marketing) ready to submit for present in Timor-Leste's Development Partner Meeting in 2015.</p>

Goal 3 – Marine Protected Areas Proposed, Managed and Establish	Target #1: Testing the Marine and Coastal Priority Area Network system and Regional Marine and Coastal Protected Areas with an emphasis in spatial planning.	<p>3.1.1. By Q2 of 2011 Timor-Leste will finalize National Grand Strategy on PAs and PA network development;</p> <p>3.1.2. By Q4 of 2011 Timor Leste will finalize zoning and management plan for Nino Konis Santana National Park (marine part);</p> <p>3.1.3. By Q3 of 2011 Timor-Leste will propose to the Council of Minister the formal declaration of two new protected areas: Atauru, Batugadé;</p> <p>3.1.4. By Q4 of 2014 Timor-Leste will start its discussion with the Indonesian Government on the establishment of a trans-boundary protected area network;</p> <p>3.1.5. Starting Q2 of 2010 Timor-Leste will develop and implement capacity building activities targeting mainly Environmental Managers in the Fisheries, Environment and Forestry Directorates (central Government) and local government officers;</p> <p>3.1.6. By Q3 of 2014 Timor-Leste will finalize study on cost estimate and sustainable financial plan for protected areas such of Atauru and Batugadé;</p> <p>3.1.7. By Q4 of 2014 Timor-Leste will strengthening ecotourism sector contribution to protected area sustainable management of coastal and marine resources.</p>
Goal 4 – Climate Change	Target #1: Region-Wide Early Action Climate Adaptation Plan for the near-shore marine and coastal environment developed and implemented.	<p>4.1.1. By Q2 of 2010 Timor Leste will adopt coral reef resilient to climate change principles in the MPA zoning/network design (linked to Action 2 of GOALS 3);</p> <p>4.1.2. By Q4 of 2010 Timor Leste will finalize studies on social resilient / vulnerability to climate change impacts;</p> <p>4.1.3. By Q2 of 2011 Timor Leste will develop and implement early warning and response plan to climate adaptation;</p> <p>4.1.4. By Q2 of 2009 Timor Leste will continue coastal rehabilitation program to anticipate climate change impacts;</p> <p>4.1.5. By Q1 of 2010 Timor Leste will continue the development and implementation of community awareness on early warning system that lead by Ministry of Transportation and Communication;</p> <p>4.1.6. By Q1 of 2011 Timor Leste will start to strictly implementing commitment to UNFCCC.</p>
	Target #2: Networked National Centers Of Excellence On Climate Change Adaptation For Marine And Coastal Environments Are Established And In Full Operation.	<p>4.2.1. By Q1 of 2012 Timor-Leste will establish a Research Center on Climate Change</p> <p>4.2.2. By Q2 of 2012 Timor-Leste will develop and operate national information network on climate change early warning and response.</p>
Goal 5 – Threatened Species Status Improving		<p>5.1. By Q3 of 2010 Timor-Leste will have started the cost-benefit analysis for the adhesion to CITES, and RAMSAR</p> <p>5.2. By Q2 of 2010 Timor-Leste will have started a cost-benefit analysis to join the IUCN</p> <p>5.3. By Q2 of 2011 Timor Leste will finalize assessment on threat status of species under different ecosystem categories to culminate the gaps identified by NBSAP;</p> <p>5.4. By Q3 of 2012 Timor-Leste will have started discussion on the development of a threatened species act and have produced at least on draft management plan for the most threatened species and/or habitat identified by NBSAP.</p>

<sup>1</sup> This activity is take into account traditional ecological knowledge through a rapid appraisal of ethnoecological knowledge

<sup>2</sup> Government has expressed the idea of creating an INFORMAL INFORMATION SHARING NETWORK, where lessons learned from other development programs are presented to Government officials (Technical staff)

<sup>3</sup> This activity and 1.4 will be conducted in collaboration with Australian Institute of Maritime Sciences (AIMS) and another research institution; the skills transfer and capacity building component of this activity requires further development, the Ministry of Agriculture and Fisheries is open to comments on this issue

<sup>4</sup> The strengthening of the legislation is to be harmonized to practices found in the Adat system in the different priority areas

<sup>5</sup> This is to be achieved by using Participatory GIS Practices or Collaborative GIS

<sup>6</sup> This should be linked to the broader "Lei de Bases para o Ambiente" proposed by other Development Partners (Project is currently on hold)

<sup>7</sup> Enforcement is intrinsically linked to the degree of understanding of the existing legislation, the Government proposed better communication, awareness and education strategies to expand communities understanding of the current legislation.



## ANNEX 2.5 TIMOR-LESTE CTI NATIONAL COORDINATING COMMITTEE

No	Position	
	CTI NCC	Government
1	National Focal Point	Director General for Forestry (MAF)
2	Administration Officer	Chief of Department for Fisheries and Aquaculture, Agriculture and Fisheries of Liquica District
3	Administration Officer	Department for Post Harvest and Quality Control of Fisheries Products, National Directorate for Fisheries and Aquaculture, Directorate General For Fisheries (MAF)
4	Monitoring and Evaluation Officer	Chief of Department for Conservation and Protection Aquatic Resources, National Directorate for Fisheries Management and Fisheries Inspection, Directorate General For Fisheries (MAF)
5	Monitoring and Evaluation Officer	Manager for Protected Area Programs, Department for Protected Area and Natural Conservation, Directorate General For Forestry (MAF)
6	EAFM Focal Point	Department for Conservation and Protection Aquatic Resources, National Directorate for Fisheries Management and Fisheries Inspection, Directorate General For Fisheries (MAF)
7	Seascape Focal Point	Director General Office, Directorate General For Fisheries (MAF)
8	MPA/TS Focal Point	Department for Conservation and Protection Aquatic Resources, National Directorate for Fisheries Management and Fisheries Inspection, Directorate General for Fisheries (MAF)
9	Climate Change Focal Point	National Director for Protection and Recovery of Biodiversity (MCIE)
10	Partners Responsibility for Research and Development Agency	Conservation International
11	Partners Responsibility for Research and Development Agency	Department for Conservation and Protection Aquatic Resources, National Directorate for Fisheries Management and Fisheries Inspection, Directorate General For Fisheries (MAF)

**Table A2.5.1.** Membership of the Timor Leste CTI National Coordinating Committee (CTI-NCC).

## ANNEX 2.6 MARINE PROTECTED AREA PLANNING PROGRAMS IN TIMOR-LESTE

Table A2.6.1. Major Marine Protected Areas planning programs, partners and activities in Timor-Leste.

Government Agency	Partner	Name of Program/Activity	Reports / Outputs	Comments
<b>UNDP TL Program of Work on Protected Areas for Timor-Leste (UN CBD)</b>				
MCIA	UNDP	National Biodiversity Strategy & Action Plan (2011-2020) (NBSAP)	NBSAP (2011)	National commitments and setting of targets for biodiversity conservation, including the establishment of a PAN.
MAF-Forestry (Protected Areas)	UNDP PoWPA	NEGA Gap Analysis (2011)	Grantham et al. (2011)	Gap analysis and proposed national Protected Area Network (PAN). Used the MPA recommendations from the LSE MPA network design.
MAF-Forestry (Protected Areas)	UNDP PoWPA	Strategic Action Plan for the Protected Area Network	McInyre (2011)	Strategic action plan for establishing a national Protected Areas Network (PAN) in Timor-Leste. Includes both terrestrial and marine areas.
MAF-Forestry (Protected Areas)	UNDP PoWPA	Capacity Building Plan for the Protected Area Network	McInyre (2011)	Capacity building and training plan to support the establishment of the national Protected Areas Network in Timor-Leste..
MAF-Forestry (Protected Areas)	UNDP PoWPA	Management Plan for the Nino Konis Santana National Park	MAF – DPANP (2011)	Management plan for NKS National Park (and Marine Park).
<b>Coral Triangle Initiative</b>				
MAF-Fisheries	CTI-CFF	CTI National Plan of Action for Timor-Leste	CTI-CFF NCC (2009)	NPOA for Timor-Leste produced under the CTI-CFF, based on RPOA (2009). Includes priorities and targets for MPAs.
MAF-Fisheries	CTI-TNC	Lesser Sunda Ecoregion MPA Network	Wilson et al. (2011)	Design of the Lesser Sunda Ecoregion MPA Network – including MPA network for the waters of Timor-Leste.
MAF-Fisheries	CTI-CFF	Coral Triangle MPA System (CTMPAS) Framework and Action Plan	CTI-CFF MPA TWG (2013)	Framework and action plan for establishing a regional, Coral Triangle MPA System, including the waters of Timor-Leste.
MAF-Fisheries	USAID-CTSP	Guidelines for Establishing Co-Management of Natural Resources in Timor-Leste	CTI-CFF NCC (2013)	Guidelines for establishing co-management regimes with local communities.
MAF-Fisheries	CTSP	Co-management of marine resources in the NKS National Park. Capacity Development Strategy.	CTI-CFF NCC (2013)	Capacity-building strategy for the the NKS Marine Park.
MAF-Fisheries	USAID-CTSP	Marine Zoning Recommendations For The Nino Konis Santana National Park Timor-Leste	CTI-CFF NCC (2013)	Zoning recommendations for the NKS Marine Park.
<b>Other Programs</b>				
MAF-Fisheries	CI	Management Plan for the Nino Konis Santana National Park (Margaret Ann Cargill Foundation)	<i>In Progress</i>	Establishment of NKS NP Steering Committee, and preparation of the NKS NP management plan.
MAF-Fisheries	UNDP-PEMSEA	Aratura Timor Seas Regional MPA Network (GEF Project 6920)	<i>In Progress</i>	Design of a regional MPA network for the ATS (based on updated data inputs). Proposed activity under the ATSEA 2 program.
MAF-Forestry	CI	Establishment of a National Protected Area System (GEF Project 9434)	<i>In Progress</i>	National Protected Areas Strategy, legislative review, biophysical, socio-economic gap analysis (major focus on terrestrial).
MAF-Fisheries	CEPF	Identification of KBAs in the Wallacea Region	CEPF (2014)	Identification of Key Biodiversity Areas in Timor-Leste, including marine.
MAF-Fisheries	CDU	Assessment and Planning of the NKS Marine Park	Edyane et al (2009)	NKS Marine Park issues, strategies, planning and management.

## ANNEX 2.7 PROPOSED LESSER SUNDA MPA NETWORK

### PROPOSED MPA NETWORK FOR TIMOR-LESTE, AS PART OF THE LESSER SUNDA ECOREGION MPA NETWORK

**Table A2.7.1.** Details of each proposed MPA in Lesser Sunda MPA network in Timor-Leste waters, including status, designation, management level, size and the main coastal and deep sea conservation targets (from Wilson et al. 2011). No = MPA identification number as per Figures 13-17; Mgt = management; CR = coral reef; SG = seagrass; M = mangrove; Tur = turtle nesting beach; Dug = dugong; UP = upwelling; ST = strait; SC = Satellite island/canyon/seamount/oceanic islands; CT = cetaceans. Size (ha) only includes the component of the protected area that covers marine waters or coastal marine targets such as mangroves. CKKLD – Proposed Marine Conservation Area; AOI – Area of Interest; TBAOI – Transboundary Area of Interest; DSAOI – Deep Sea Area of Interest.

Shallow Water MPAs														
No	Name	Status	Designation	Level	Size (ha)	Coastal features					Deepsea features			
						CR	SG	M	Tur	Dug	UP	ST	SC	CT
Timor-Leste														
77	Batu Gade*	Proposed	CKKLD	District	12,491	X	X	X				X		
78	Suai	AOI		National	7,136			X				X		
79	Behau	Proposed	CKKLD	District	27,934	X	X	X				X		
80	Atauro Is	Proposed	CKKLD	District	10,882	X	X					X	X	
81	Lamsanak	Proposed	CKKLD	District	15,242	X	X	X				X	X	
82	Manufahi#	AOI		National	18,329	X	X					X		
83	Nino Konis Santana	Existing	TN	National	55,600+	X	X					X	X	X
Deep Sea MPAs														
Indonesia - Timor-Leste														
96	Ombai transboundary	Proposed	TBAOI	transboundary	594,766	X	X	X				X	X	X
97	Liran-Atauro transboundary	Proposed	TBAOI	transboundary	186,407	X	X					X	X	X
98	South Wetar transboundary	Proposed	TBAOI	transboundary	230,823	X	X					X	X	X
Timor-Leste														
99	Manufahi - Deep Sea	Proposed	DSAOI	National	223,648							X		
100	Nino Konis Santana-Deep Sea	Proposed	DSAOI	National	113,538							X	X	X

\*77. Batu Gade MPA is actually in the waters of Timor-Leste, not in Indonesia (see Wilson et al 2011, Figure 17, page 33 and Table 11, page 80).

#82. Manufahi MPA is actually in Viqueque District, not Manufahi.

+ The area estimate provided by Wilson et al (2011) (125,699 ha) is for the entire park (marine-terrestrial). The marine component is 55,600 ha.

Note: This Table (from Wilson et al 2011) is out-of-date (data insufficient) and/or inaccurate for Timor-Leste waters. Especially with regard to information on turtles, dugongs, cetaceans, mangroves and upwellings.

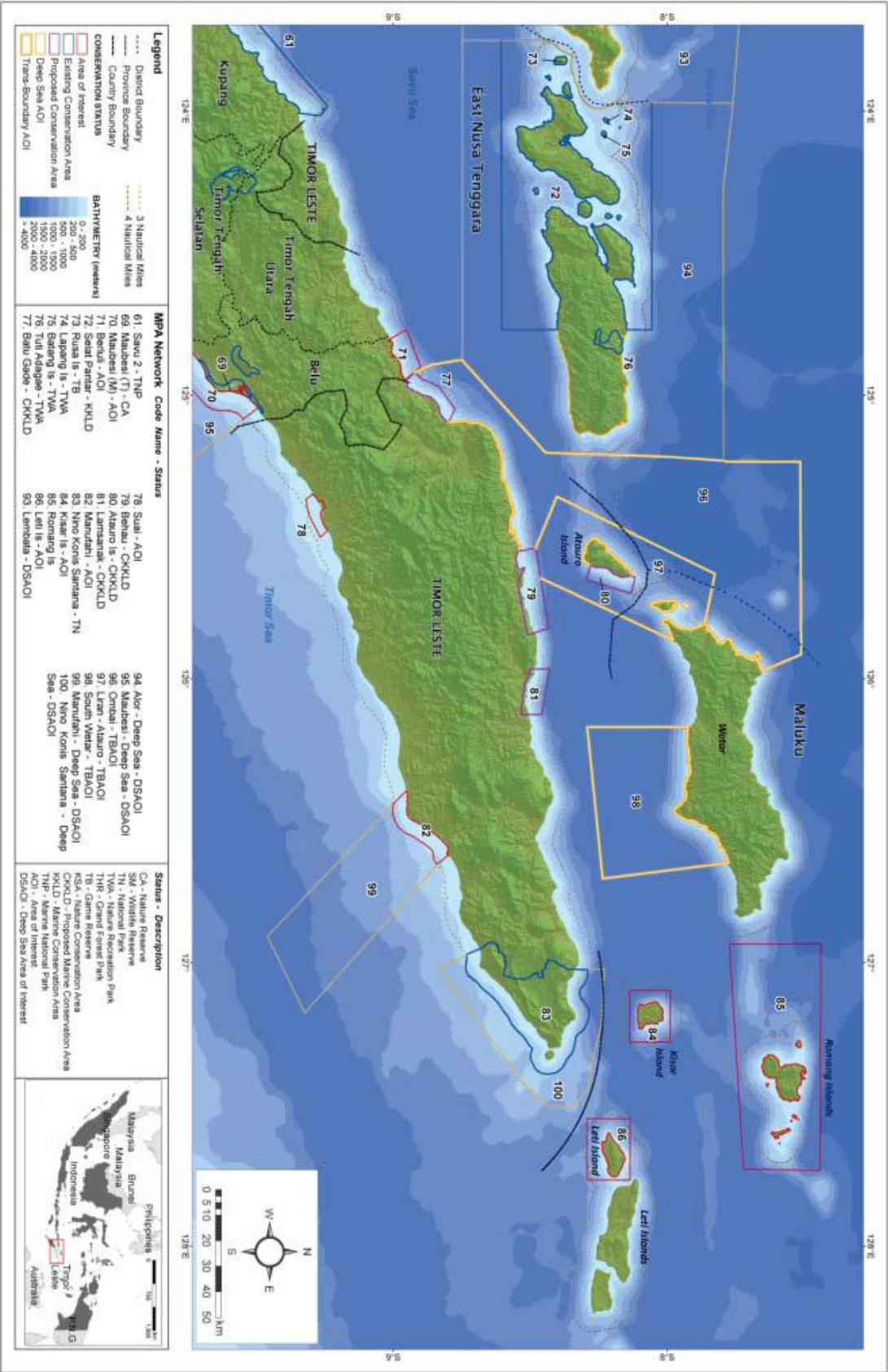


Figure A.2.7.1. Proposed MPA Network for Timor-Leste, identified as part of the regional Lesser Sunda Ecoregion MPA Network (from Wilson et al. 2011).

## ANNEX 2.8 CURRENT MARINE CONSERVATION ESTATE IN TIMOR-LESTE

**Table A2.8.1.** Current and proposed Marine Protected Areas (MPAs) and Locally Marine Managed Areas (LMMAs) in Timor-Leste (as of September 2018).

### CURRENT / PROPOSED MPAs AND LMMAs IN TIMOR-LESTE

Name, Municipality	TOTAL AREA (HA)	DATE OF DECLARATION	PARTNERS	PROGRESS
<b>NATIONAL PARKS</b>				
Parque Nacional Nino Konis Santana (marine) (Lautem)	55,600	1 August 2007	NSW Parks & Wildlife, BirdLife International, Charles Darwin University	surveys, gazetted, management plan
<b>AQUATIC NATURAL RESERVES</b>				
Vila Reserva Natural Aquatica (Atauro Island)	5,085	25 February 2015	ADB-ANZDEC	surveys, <i>tara bandu</i> ceremony, gazetted, management plan
Batugade Reserva Natural Aquatica (Bobonaro)	11,259	25 February 2015	ADB-ANZDEC	surveys, <i>tara bandu</i> ceremony, gazetted, management plan
<b>TOTAL AREA</b>	<b>71,944</b>			
<b>LOCALLY MARINE MANAGED AREAS</b>				
Nino Konis Santana LMMAs (3) – Tutuala Lore Com	1,600 270 100	2016 2016 2016	USAID-CTSP (CI)	<i>tara bandu</i> ceremonies, management plans (3), no gazettals
<b>Subtotal</b>	<b>1,970</b>			
Atauro Island LMMA network (5)* – Beloi (& 3 NTZs)@ Uaro-ana Akrema Adara Vila#	537 32 45 25 138	15 December 2017 20 September 2017 20 September 2017 15 December 2017 21 September 2017	ADB-CI (LMMAs), Coral Triangle Center (network), WorldFish, BV	<i>tara bandu</i> ceremonies 4 Suco regulations - Adara, Vila, Beloi, Bikeli (Uaro-ana, Akrema), no gazettal or management plans
<b>Subtotal</b>	<b>777</b>			
<b>TOTAL AREA</b>	<b>2,747</b>			
<b>NO-TAKE ZONES (FISHERIES REGULATIONS)</b>				
Nino Konis Santana - 7 NTZs (Lautem)	207 km <sup>2</sup>	2 June 2013	USAID-CTSP (CI)	Fisheries Regulation
<b>PROPOSED MPAS &amp; LMMAS</b>				

Name, Municipality	TOTAL AREA (HA)	DATE OF DECLARATION	PARTNERS	PROGRESS
Batugade-Atapupu (FMA 714) (Bobonaro)	-	-	FAO	Transboundary MPA (Indonesia- Timor-Leste) proposed under ISLME project (FAO)
Ilik-namu, Biqueli (Atauro)	45		BV, Darwin Initiative	Suco regulations finalized, but not formalised.
Kaitehu-Ulmera (Liquica)	-	-	CTC (TNC)	MPA being progressed by TL CTI NCC
Ilimanu, Behau (Dili)	20	-	BV, KFF, Darwin Initiative	Suco regulations at consultation stage.
Lamsanak or Ma'abat (Manatuto)^	-	-	BV, Oriental University, KFF, Lighthouse Foundation, PEMSEA	Mangrove restoration, 'tara bandu' consultations
Betano-Clacuc (Manufahi)	90,000	-	PEMSEA	MPA proposed under ATSEA2
<p># Vila LMMA is based on the Vila Aquatic Natural Reserve, but has extended the boundary. It is expected that the new extended boundary will be updated for the Aquatic Natural Reserve.</p> <p>* LSE MPA Network proposed a MPA on the east of the island (10,882 ha), but this has been superseded by 'whole of island' approach and LMMA network . With the support of CI and CTC, a network of 13 LMMAs are proposed for Atauro Island. Whole of island' protected area (marine-terrestrial) currently been proposed under ADB CTP2 program – incorporating the network of LMMAs.</p> <p>@ Beloi MPA (537 ha), with 3 No-Take Zones (NTZs) in Usubemaso and Lagoa aldeias.</p> <p>^Original MPA (8ha) regulations formalised in 2013 on lulik land and waters, but now degraded. Regulations now obsolete. New <i>tara bandu</i> discussions underway. Lamsanak MPA (15,242 ha) proposed under LSE MPA Network.</p>				



**Table A2.8.2.** Current status of MPA and LMMA planning in Timor-Leste (based on data provided by the TL CTI NCC) (as of 15 October 2018).

No	Location	Municipality	Ministerial Diploma	Suco Regulation / Customary Law	Ongoing Md Process	Ongoing Physical & Consultation	Implementing Partner/s
<b>Atauro Island</b>							
1	Vila Maumeta	Dili	Need to revise MD <sup>1</sup>			Complete	CI, BV <sup>2</sup>
1	Vila Maumeta	Dili	MD-MAF 2015	Existed	Complete	Complete	FZ ANZDEC
2	Uaroana	Dili		Existed, Tarabandu-2017	Drafted	Complete	CI, WorldFish <sup>3</sup>
3	Acrema	Dili		Existed, Tarabandu-2017	Drafted	Complete	CI
4	Vatuu	Dili		Drafted		Ongoing	CI
5	Adara (expanded MPA)	Dili		Existed, Tarabandu-2016	Drafted	Complete	CI
5	Adara	Dili		Existed, Tarabandu-2013	None	Ongoing	WorldFish
6	Atekru	Dili		Drafted	Drafted	Ongoing	CI
7	Maker	Dili		Drafted	Drafted	Ongoing	CI
8	Beloi-1, 2, 3	Dili		Existed, Tarabandu-2017	Drafted	Complete	CI, WorldFish, BV
9	Berau	Dili		Drafted	Drafted	Complete	CI
10	Doro-Ilana	Dili		Drafted	Drafted	Ongoing	CI

<sup>1</sup> Need to revise existing MD due to area expansion.

<sup>2</sup> Blue Ventures (BV) is is Beloi and Vila's community's partner for monitoring coral reefs (Reef Check) and seagrasses (Seagrass Watch).

<sup>3</sup> WorldFish have undertaken coral reef fisheries stock assessments at Adara, Beloi, Uaro-ana (and Vemasse). As part of the development of a national fisheries catch (and effort) system, WorldFish also have 8 fish landing sites on Atauro Island (and to-date, another 8 landing sites on the mainland) to assess fisheries catches. CI is also undertaking fisheries assessments and catch monitoring in LMMAs. The Coral Triangle Centre (TNC) is also undertaking coral reef and fisheries assessments on Atauro Island. As a matter of priority, LMMA/MPA planning and management, coral reef and fisheries monitoring in LMMAs/MPAs and across Timor-Leste needs to be coordinated (particularly on Atauro Island).

11	Ilik-namu (Biqueil)	Dili		Drafted		Ongoing	BV <sup>4</sup>
<b>Nino Konis Santana Marine Park<sup>5</sup></b>							
12	Kusu-Com	Laurem		Existed, Tarabandu-2013	Drafted	Complete	CTSP-CI
13	Dionu-Turtuala	Laurem		Existed, Tarabandu-2013	Drafted	Complete	CTSP-CI
14	Pereveno-Turtuala	Laurem		Existed, Tarabandu-2013	Drafted	Complete	CTSP-CI
15	Helapuna-Turtuala	Laurem		Existed, Tarabandu-2013	Drafted	Complete	CTSP-CI
16	Vinano-Lore I	Laurem		Existed, Tarabandu-2013	Drafted	Complete	CTSP-CI
17	Souco-Lore I	Laurem		Existed, Tarabandu-2013	Drafted	Complete	CTSP-CI
18	Com-Parlamento, DS MPA	Laurem		Drafted	None	Complete	CI
<b>North Coast</b>							
19	Kaitehu, Ulmera	Liquica		None	None	Ongoing	MAF-CTC
20	Lagoa-Maubara and coastal habitat, Vatuvo	Liquica		None	None	Ongoing	CI
21	Beacou-Aidabalete and Palaka-Sanirin	Bobonaro		None	Existed	Ongoing	CI
22	Beacou	Bobonaro		Existed, Tarabandu-2012	None	Ongoing	FAO-RFLP
23	Lagoa-Be Malae, (Sanirin-Aidabaleten)	Bobonaro		None	None	Ongoing	CI
24	Nu-Badak, Batugade	Bobonaro	Need to revise MD <sup>6</sup>		None	Complete	CI
24	Nu-Badak, Batugade	Bobonaro	MD-MAF 2015		Complete	Complete	FZ ANZDEC

<sup>4</sup> Darwin Initiative is a key donor/partner.

<sup>5</sup> Under ATSEA2, funding has been allocated to PEMSEA to strengthen LMMAs in the Nino Konis Santana Marine Park.

<sup>6</sup> Need to revise existing MD due to area expansion.



25	Lamsana, Obrato	Manaturo		Existed, Tarabandu-2013	None	Complete	PEMSEA, BV, Oriental University <sup>7</sup>
26	Behau, Ilimano-Umacaduc-Lacio	Manaturo		None	None	Ongoing	BV, KFF <sup>8</sup>
27	Mangrove forests, Hera-Metnaro	Dili	SNAP, 2016, need to create Marine NTZ	Drafted	None	Ongoing	
28	Lagoa Tacitolu and its coastal habitat	Dili	SNAP, 2016, need to create Marine NTZ	None	None	None	
29	Mt. Gugleur-Inur Karimbala		SNAP, 2016, need to create Marine NTZ				
30	Citrana Mangrove forests-Coastal habitat	Oecussi	SNAP, 2016, need to create Marine NTZ	None	None	None	
31	Sacato	Oecussi		None	None	None	
<b>South Coast</b>							
32	Modomahur <sup>9</sup>	Manufahi		Tara Bandu	Drafted	Complete	PEMSEA

<sup>7</sup> Lighthouse Foundation is a key donor/partner. BV to implement fisheries and mangrove restoration monitoring. No 'in-water' monitoring due to the presence of crocodiles.

<sup>8</sup> Darwin Initiative is a key donor/partner. BV to implement fisheries monitoring, KFF to implement coral reef monitoring (using 'ReefCheck').

<sup>9</sup> Under ATSEA2, funding has been allocated to PEMSEA for the establishment of the Betano-Clacuc (Manufahi) MPA (90,000 ha).

## ANNEX 2.9 NINO KONIS SANTANA MARINE PARK

The Nino Konis Santana (NKS) National Park, located on the eastern-most tip of Timor-Leste (Figure 7), is the nation's first and only national park. Declared in 2007, five years after Timor-Leste's independence, the park encompasses over 1,236 km<sup>2</sup> of terrestrial estate and 556 km<sup>2</sup> of marine territorial waters (1.3% of the national EEZ), and encompasses 29.5% of the coral reefs of Timor-Leste. The NKS Park is home to numerous endangered and endemic species including the critically endangered Yellow-crested Cockatoo, the endemic Timor-Green Pigeon, and the endangered Timor Imperial Pigeon.

**Table A2.9.1.** Declaration of the Nino Konis Santana National Park (under Government Resolution 8/2007).

<b>Objective</b>	Creates the Nino Konis Santana National Park due to the high natural values involved, namely the great diversity of species, ecosystems and habitats of high level of endemism and marine biodiversity.
<b>Incidence Area</b>	The Park covers a total area of 123,600 ha, covering an onshore area of 68.000ha and marine area of 55.600ha, which include three areas: Jaco Island and surrounding area, the Tutuala beach and the Lore Reserve.
<b>General Objectives</b>	For the preservation and enhancement of habitats and the promotion of sustainable development in the region are determined
<b>Specific Objectives</b>	<ol style="list-style-type: none"> <li>1. To preserve and enhance the natural landscape, terrestrial or marine heritage through a proper planning as the potential and characteristics of each area aimed at the preservation of biodiversity and the sustainable use of species, habitats and ecosystems;</li> <li>2. Support traditional human activities enhancing their economic development and the welfare of local residents, in harmony with the conservation of nature;</li> <li>3. Enhance and protect the architectural, archaeological and ethnological heritage of the region, promoting their dissemination and environmental education;</li> <li>4. Guiding and disciplining the tourism and recreational activities in order to avoid degradation of the heritage of the region and enable their sustainable use.</li> </ol>
<b>Use and management regime</b>	<p>The following acts and activities are prohibited:</p> <ul style="list-style-type: none"> <li>• to change the morphology of the soil by the institution or expansion of deposits of junkyard, junk, vehicles, or other solid waste that cause negative visual impact or pollute the soil, air or water, as well as the leakage of waste, debris, rubble or scraps outside places intended for such;</li> <li>• release of industrial or household wastewater in the natural aquifer, soil or subsoil likely to cause pollution;</li> <li>• harvest, capture, slaughtering or detention of specimens of plants or animals, terrestrial or marine species, subject to measures of legal protection at any stage of its evolution, with the exception of actions undertaken by the Natural Park and the scope of scientific activities specifically authorized by it;</li> <li>• the collection of geological samples and animal and plant species subject to protection measures which, by their nature, are not derived from normal agricultural activity;</li> <li>• the transit of boats through the park area where this navigation is likely to disturb or harm its ecosystem;</li> <li>• any kind of fishing in the area that includes the Strait of Jaco, except line and hook fishing for subsistence from residents in the district Tutuala.</li> </ul>

From: Resolução do Governo n.º 8/2007 de 1 de Agosto

## ANNEX 2.10 MARINE PROGRAMS, ACTIVITIES IN THE NKS MARINE PARK

Table A2.10.1. Major marine programs, partners, and outputs for the Nino Konis Santana Marine Park.

Agencies	Partners	Donor	Activities	Key Sites	Outputs
MAF-Fisheries	Conservation International	To be advised.	community-based participatory mapping of NKS Park.	NKS Park	No reports, datasets or outputs yet.
MAF-Fisheries	Conservation International	CMS Dugong & Seagrass Project	dugong monitoring, seagrass monitoring, ecotourism development	Com	See project website, reports. No available data yet.
MAF-Fisheries	WorldFish	AUSAID, NORAD	LMMPs, fisheries, coastal livelihood assessments	NKS Marine Park	No available reports, datasets on fisheries catch and effort, coral reef health, available.
MAF-Fisheries	Conservation International	FAO	training and marine monitoring (fisheries, conservation, LMMPs) by local community (using WorldFish software, training, technical support), fisheries management plans	Com, Tutuala and Lore	See progress reports. No available data yet.
MAF-Fisheries	Conservation International	USAID-CTSP	establishment of 3 co-managed LMMPs; training and marine monitoring by local community; zoning plan for NKS Marine Park; capacity development strategy for NKS Marine Park	Com, Tutuala and Lore	LMMPs established, Zoning Plan (CTSP 2013) Capacity Development Strategy (CTSP 2013). Suco regulations and management plans (not available)
MAF-Fisheries	Conservation International	Margaret Ann Cargill Foundation	establishment of a NKS Steering Committee; preparation of NKS management plan	NKS Park	Project status unknown. Reports not accessible/available.
MAF-Protected Areas	UNDP	UNDP	preparation of NKS management plan (including Marine Park)	NKS Park	NKS Management Plan (McIntyre 2011)
MAF-Fisheries	NOAA-CREP	USAID-CTSP	coastal-marine habitat mapping, coral reef and fish survey of northern coast of Timor-Leste (June 2013)	NKS Marine Park	PISC (2017)
MAF-Fisheries	Conservation International	USAID-CTSP	systematic survey of coral reefs of the NKS Marine Park - Marine Rapid Assessment Program (MRAP) for NKS Marine Park (August 2012)	NKS Marine Park	Allen & Erdmann (2012), Turak & DeVantier (2012, 2013)
MAF-Fisheries	Australian Museum	AM	coral reef survey of the north coast of Timor-Leste – (September 2012)	NKS Marine Park	Scientific papers (marine taxonomy).
MAF-Fisheries	Charles Darwin University	CDU, RDTL	systematic survey of coral reefs (coral, invertebrates, fish) of the NKS Marine Park (November 2008)	NKS Marine Park	Ayling et al. (2009), Edyvane et al. (2009b)
MTAC, UNTL	Charles Darwin University	None.	cetacean monitoring - public sightings/reporting program, scientific surveys (CDU)	NKS Marine Park	Whales & Dolphins (Baleia no Golfinhu) of Timor-Leste
MTAC	Charles Darwin University	CDU, RDTL	assessment of NKS Marine Park issues, strategies, planning and management	NKS Marine Park	Edyvane et al. (2009b)
MAF-Fisheries	Charles Darwin University	CDU, RDTL	coastal-marine habitat mapping and survey of the north coast of Timor-Leste	NKS Marine Park	Boggs et al. (2009)
MAF-Fisheries	Charles Darwin University (CDU)	CDU, RDTL	turtle and marine megafauna surveys of the north coast of Timor-Leste	NKS Marine Park	Dethmers et al (2009),
MTAC	CDU-Australian National University	CDU, RDTL	natural-cultural-heritage assessment of the north coast of Timor-Leste for coastal ecotourism	NKS Marine Park	Edyvane et al. (2009a)

## ANNEX 2.11 MARINE PROGRAMS, ACTIVITIES ON ATAURO ISLAND

Table A2.11.1. Major marine programs, partners, and outputs for Atauro Island.

Agencies	Partners	Donor	Activities	Key Sites	Outputs
MAF-Fisheries	WorldFish	AUSAID, NORAD	fisheries and coastal livelihood assessments, FADS, LMMAs, climate change adaptation	whole of island	Adara LMMMA, Park et al. (2010), Mills et al. (2011)
MAF-Fisheries	Blue Ventures	CMS Dugong & Seagrass Project	seagrass, dugong, coral reef & fisheries monitoring, ecotourism development	BeloI, Vila	See project website, reports.
MAF-Fisheries	Conservation International	FAO	training and marine monitoring (fisheries, conservation, LMMAs) by local community (using WorldFish software), fisheries management plans	BeloI	See progress reports. No available data yet.
MAF-Fisheries	Conservation International	ADB-CTP2 (extension)	establishment of co-managed LMMMA, training and monitoring by local community	BeloI, Vila, Uaro-ana, Akrema, Adara	BeloI, Uaro-ana. Akrema LMMAs, 4 suco regulations, revision of Vila and Adara LMMAs
MAF-Fisheries	Blue Ventures	Darwin Initiative	establishment of co-managed LMMMA, BV (community's partner) monitoring coral reefs (Reef Check), seagrasses & fisheries	Ililik-namu (Biqueil)	Ililik-namu LMMMA, draft suco regulations
MAF-Fisheries	ANZ DEC FG	ADB-CTP2	planning, establishment of Vila Aquatic Nature Reserve – including biophysical, socio-economic surveys & reports.	Vila	Vila Aquatic Nature Reserve Management Plan (2015)
MAF-Fisheries	Conservation International	To be advised.	Marine Rapid Assessment Program (MRAP) of Atauro Island (hard corals and fish surveys (June 2016)	whole of island	No available data/reports.
MAF-Fisheries	Coral Triangle Centre	TNC, CTI	establishing island-scale, LMMMA network – including biophysical, socio-economic surveys.	whole of island	No available data/reports.
MAF-Fisheries	NOAA-CREP	USAID	coastal-marine habitat mapping, coral reef and fish surveys of northern coast of Timor-Leste (2013)	whole of island	PISC (2017)
MTAC, UNTL	Charles Darwin University-Blue Ventures	None.	cetacean monitoring and ecotourism development - public sightings/reporting program, cetacean monitoring (BV, local fishers), scientific surveys (CDU)	whole of island	'Whales & Dolphins (Baleia no Golfinhu) of Timor-Leste'
MTAC	Charles Darwin University	CDU, RDTL	turtle and marine megafauna surveys (2008)	whole of island	Dethmers et al (2009)
MTAC	Charles Darwin University	CDU, RDTL	community-based ecotourism mapping, planning/development	whole of island	Quintas (2014)
MTAC	Charles Darwin University	CDU, RDTL	coastal-marine (and terrestrial) habitat mapping (2010)	whole of island	Lieper et al. (2011)
	Roman Luan	None.	traditional knowledge mapping of Atauro Island – local names, 'tara bandu'	whole of island	Maps available.
MAF-Fisheries	UNESCO, Roman Luan	UNESCO	revitalising traditional ecological knowledge (TEK) – coastal ecosystems (Bikeli), fishing methods (Makili)	Bikeli, Makili	'Ekosistema Tasi Nini' (UNESCO 2013), 'Metodu Peska' (UNESCO 2013)
MAF-Fisheries	WWF-Pacific, TRC, DMS	AUSAID, CTI, WWF	'Coral Triangle Sustainable Tourism Project' - marine ecotourism destination marketing, brand development	whole of island	'Nature-based Marine Tourism in the Coral Triangle' (2015); 'Atauro Island Destination Plan' (2018)
MAF-Fisheries	Helen Abbott	ANU	traditional fishing, maritime customary knowledge, practices	Makili	PhD thesis.
-	Cintia Gilliam	St Marys University, Halifax, Canada	LMMAs, social resilience, 'tara bandu' on Atauro Island	-	PhD (in-progress).

## ANNEX 2.12 MPAS MANAGEMENT EFFECTIVENESS ASSESSMENT TOOL (MEAT)

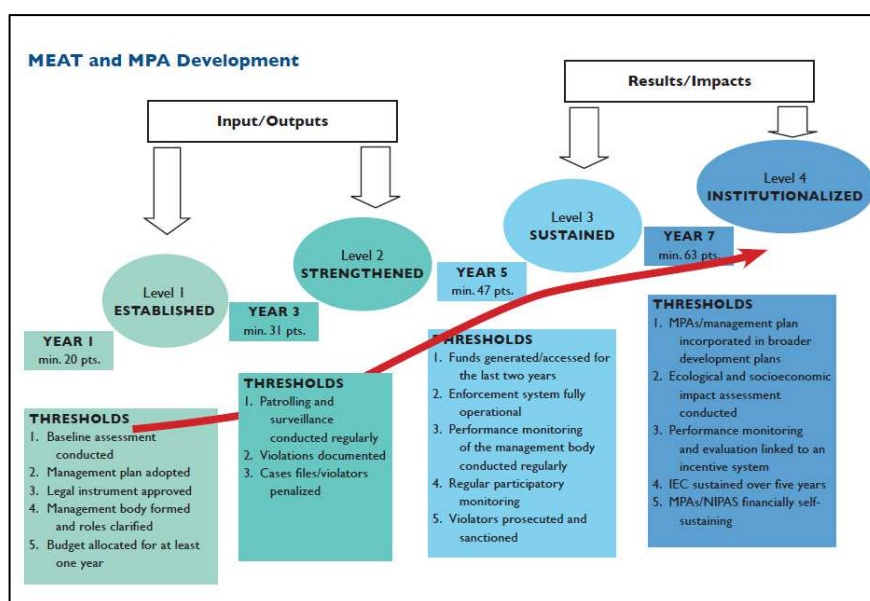
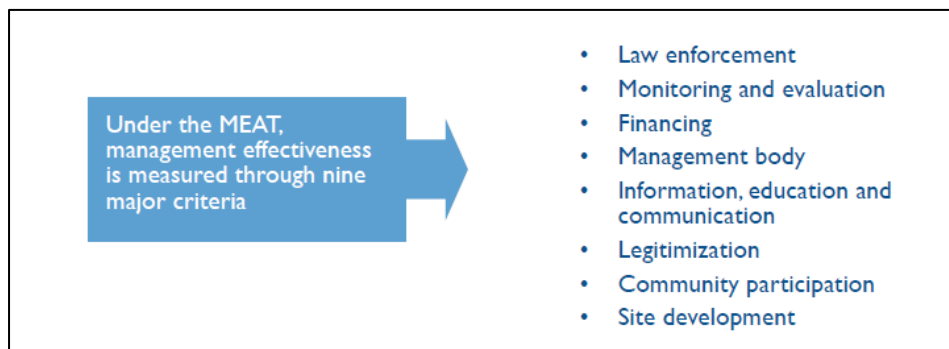
### CTI MPAS Management Effectiveness (MEAT)

In establishing a Marine Protected Areas network in Timor-Leste, as part of the regional Coral Triangle MPA System (CTMPAS), Timor-Leste is committed to assessing the management effectiveness (ME) of its MPAs, through the use of the Management Effectiveness Assessment Tool (MEAT) (CTSP 2013). A key component of this is monitoring and evaluation through baseline assessments, annual participatory biophysical monitoring, socio-economic monitoring and impact assessments.

The MEAT assesses ME of individual MPAs, according to nine major management effectiveness criteria:

1. **community participation** in establishment process
2. presence of **management plan** drafted, adopted, implemented, reviewed, updated and incorporated in broader development plans
3. presence of **management body** with identified members with clear roles and responsibilities and are capable of supervising management activities and sourcing funds
4. presence of a **legal instrument** that is sufficient to enforce the MPA such as municipal ordinance for locally-managed, and presidential proclamation or republic act for nationally-managed MPAs
5. availability of sufficient **funds** for the operations of the MPA through annual budget allocations from the barangay, municipal or provincial LGUs, sourced out from assisting NGOs, revenues from user fees, entrance fees and other sustainable financing schemes with the end view of maintaining a self-sufficient MPAs
6. regular **awareness campaigns** to disseminate information on the MPA, its boundaries, its policies, its management
7. presence of an **enforcement** system with a composite, capacitated team that conducts regular monitoring, control and surveillance, with records of violations, number of cases filed or violators penalized and sanctions enforced
8. presence of **monitoring and evaluation** system with baseline assessments, annual participatory biophysical monitoring, socioeconomic monitoring and impact assessments
9. development of the site through construction of various support facilities and infrastructure and expansion strategies or resource enhancement programs.

To-date, Timor-Leste remains the only country in the CT6 not to have conducted a formal assessment of the ME of its MPAs and LMMAs.

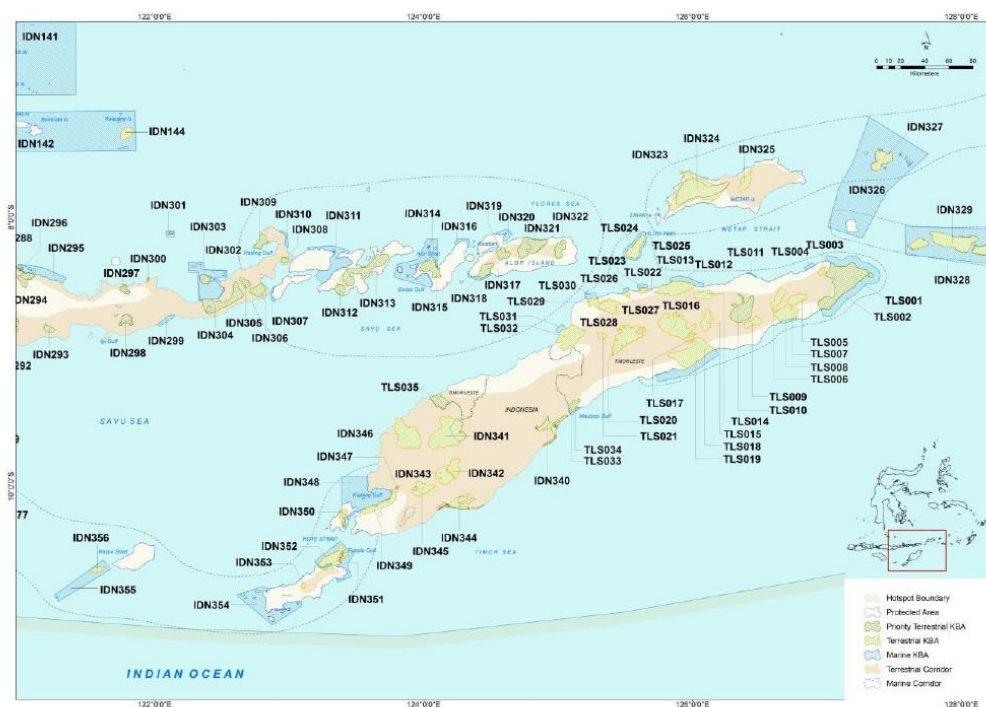


**Figure A2.12.1.** From *‘Benchmarking MPA Performance Towards Promoting Effective Management.’* CTSP (2013).

## ANNEX 3.1 KEY MARINE BIODIVERSITY AREAS (KBA'S) IN TIMOR-LESTE

### IDENTIFIED AREAS OF KEY MARINE BIODIVERSITY (KBA'S) IN TIMOR-LESTE

**Figure A3.1.1.** Map of KBAs in eastern Lesser Sundas (including Timor-Leste) (from CEPF 2014).



KBA Code	KBA Name	Municipality	Area (Ha)	KBA Status	Protected Area Status
TLS002	Perairan Nino Konis Santana	Lautem	60,256	Confirmed	Yes
TLS004	Raumoco	Lautem	2,036	Confirmed	No
TLS008	Perairan Irabere–Iliomar	Viqueque & Lautem	2,489	Candidate	No
TLS011	Kaibada	Baucau	571	Confirmed	No
TLS012	Perairan Subaun	Dili and Manatuto	10,654	Confirmed	No
TLS019	Perairan Sungai Klere	Manufahi & Manatuto	31,643	Candidate	No
TLS023	Perairan Areia Branca no Dolok Oan	Dili	2,384	Confirmed	No
TLS025	Perairan Atauro	Dili	10,542	Confirmed	No
TLS026	Perairan Tasitolu	Dili	1,208	Confirmed	No
TLS030	Perairan Maubara	Liquica	3,624	Candidate	No
TLS031	Perairan Be Malae	Bobonara	2,945	Candidate	No
TLS034	Perairan Tilomar	Covalima	1,200	Candidate	No
<b>Total Area (Marine KBAs)</b>			<b>129,552 (ha)</b>		

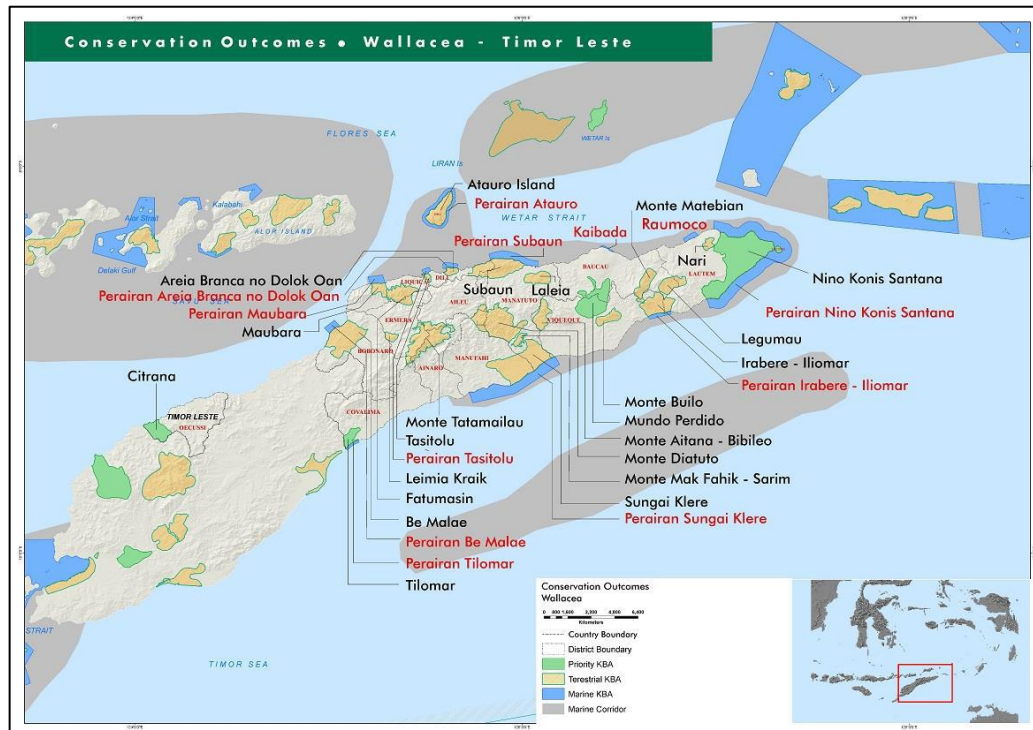
**Table A3.1.1.** Twelve priority marine Key Biodiversity Areas (KBAs) (and candidate KBAs) identified in Timor-Leste (from CEPF 2014). [Perairan='water']. Several of these KBAs are now protected (under Decree Law 5/2016) or currently being progressed for establishment of LMMAs (see Annex 2.8).



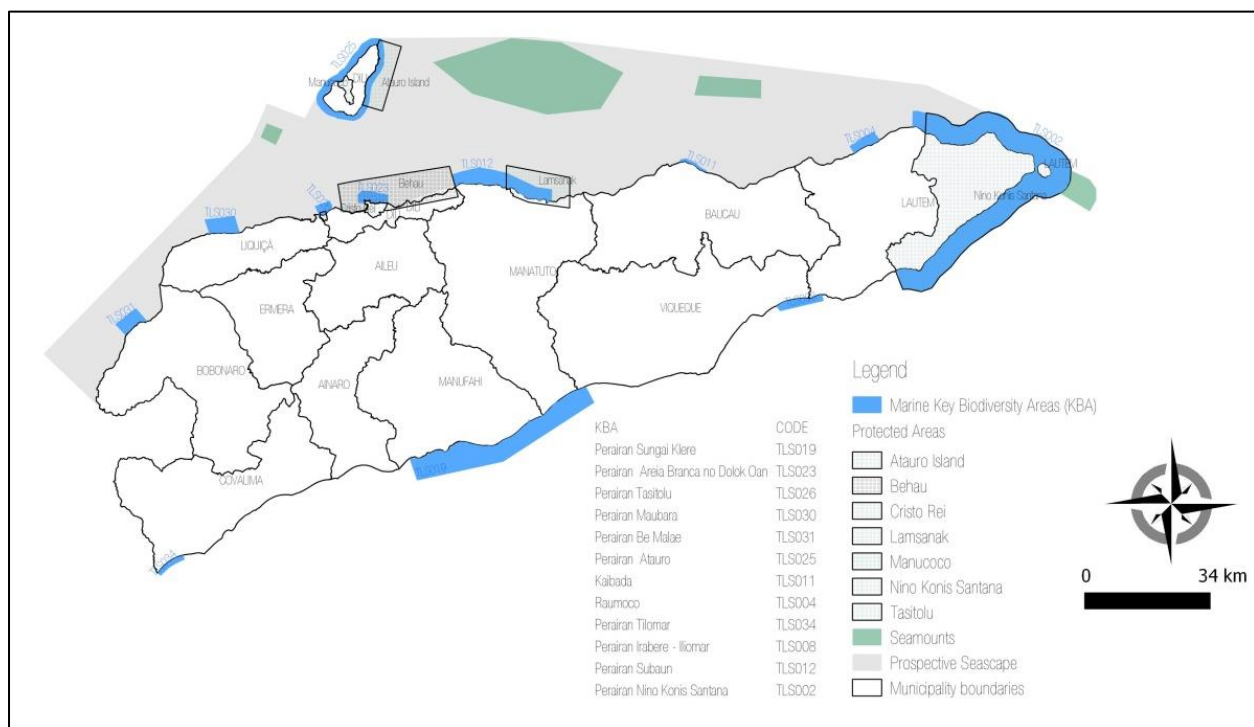
**Table A3.1.2.** List of contiguous Terrestrial and Marine KBAs in Timor-Leste (from CEPF 2014).

Terrestrial Code and Name		Marine KBA/Candidate KBA Code and Name		Province/Timor-Leste Municipality	Relationship between KBAs
TLS001	Nino Konis Santana	TLS002	Perairan Nino Konis Santana	Lautem	Adjacent
TLS007	Irabere-Iliomar	TLS008	Perairan Irabere-Iliomar	Viqueque and Lautem	Adjacent
TLS013	Subaun	TLS012	Perairan Subaun	Dili and Manatuto	Adjacent
TLS018	Sungai Klere	TLS019	Perairan Sungai Klere	Manufahi and Manatuto	Adjacent
TLS022	Areia Branca no Dolok Oan	TLS023	Perairan Areia Branca no Dolok Oan	Dili	Adjacent
TLS024	Atauro Island	TLS025	Perairan Atauro	Dili	Inside
TLS027	Tasitolu	TLS026	Perairan Tasitolu	Dili	Adjacent
TLS029	Maubara	TLS030	Perairan Maubara	Liquica	Adjacent
TLS032	Be Malae	TLS031	Perairan Be Malae	Bobonara	Adjacent
TLS033	Tilomar	TLS034	Perairan Tilomar	Covalima	Adjacent

**Figure A3.1.2.** Proposed marine (red font) and terrestrial (black font) key biodiversity areas (KBAs) in Timor-Leste (priority terrestrial KBAs highlighted in darker green) (from CEPF 2014).







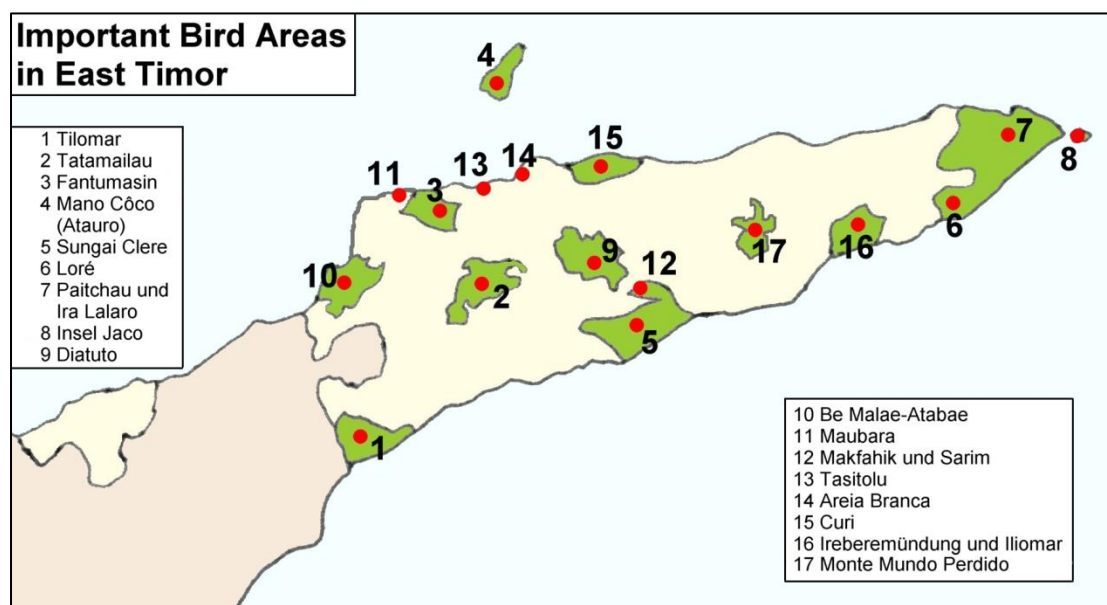
## ANNEX 3.2 AREAS OF HIGH CONSERVATION SIGNIFICANCE FOR BIRDS

### LIST OF RECOGNISED IMPORTANT BIRD AREAS (IBA'S) AND ENDEMIC BIRD AREAS (EBA'S) FOR TIMOR-LESTE

**Table A3.2.1.** Recognised Important Bird Areas (IBA) in Timor Leste, including previous assessments (from Trainor *et al.* 2007).

IBA No.	Location	Assessment Undertaken			Area (ha)
		1982 FAO/UNDP	1989 Report	2000 UNTAET	
TL1	Tilomar	✓	✓	✓	22,708
TL2	Tata Mailau	✓	✓	✓	20,372
TL3	Fatumasin	✓	✓	✓	13,616
TL4	Ataúro Island – Manucoco	✓	✓	✓	14,118
TL5	Sungai Clere	✓	✓	✓	42,266
TL6	Lore	✓	✓	✓	10,906
TL7	Monte Paitchao and Lake Iralalaru	✓	✓	✓	55,797
TL8	Jaco Island	✓	✓	✓	1,099
TL9	Mount Diatuto	✓	✓	✓	34,462
TL10	Be Malae-Atabae			✓	27,848
TL11	Maubara			✓	5,292
TL12	Mount Mak Fahik and Mount Sarim			✓	2,961
TL13	Tasitulo			✓	1,540
TL14	Areia Branca Beach and Hinterland			✓	2,994
TL15	Mount Curi			✓	20,086
TL16	Irabere Estuary and Tilomar Forest			✓	16,564

**Figure A3.2.1.** Map of Important Bird Areas in Timor Leste (from WikiCommons)



COUNTRY	Timor-Leste
AREA	14,874 km <sup>2</sup>
BIRDLIFE PARTNER	NONE
SPECIES	
Total number of birds	<u>236</u>
Globally threatened birds	<u>6</u>
Country endemics	<u>0</u>
IMPORTANT BIRD & BIODIVERSITY AREAS	
Number of IBAs	<u>16</u>
Total IBA area	290,725 ha
Number of IBAs in Danger	<u>0</u>
ENDEMIC BIRD AREAS	
Number of EBAs	<u>1</u>
Number triggered by individual criteria	
Globally threatened species (A1)	<u>8</u>
Restricted-range species (A2)	<u>13</u>
Biome-restricted species (A3)	<u>0</u>
Congregatory species (A4)	<u>0</u>
Number of AZE sites identified for birds	<u>0</u>

**Table 3.3.2.** Current status of Important Bird Areas in Timor-Leste (from BirdLife International, DataZone - <http://datazone.birdlife.org/country/timor-leste/ibas>).

## ANNEX 3.3 WETLANDS OF HIGH CONSERVATION SIGNIFICANCE

### WETLANDS OF NATIONAL IMPORTANCE FOR TIMOR-LESTE

**Table A3.3.1.** Recognised wetlands of national significance in Timor-Leste, based on waterbird and wader species (Trainor *et al.* 2007, NBSAP 2012). T=threatened; NTS=near threatened species.

No.	Site	Habitats	Total No. of Species (T & NTS)	Threatened and Near Threatened Species (T & NTS)
1	Tasitulo (IBA)	Saline lakes, mudflats, beach	59 (31)	Malaysian clover ( <i>Charadrius peronii</i> ), Black-tailed codwit ( <i>Limosa limosa</i> )
2	Seical Estuary	mangroves, mudflats	51 (260)	Beach thick-knee ( <i>Esacus giganteus</i> ), Malaysian plover ( <i>Charadrius peronii</i> ), Black-tailed codwit ( <i>Limosa limosa</i> )
3	Lake Iralalaru (part of IBA)	Freshwater lake, swamps, stream	51 (20)	Malaysian plover ( <i>Charadrius peronii</i> ), Black-tailed codwit ( <i>Limosa limosa</i> )
4	Lake Laga	Saline lake, beach	39 (250)	Malaysian plover ( <i>Charadrius peronii</i> ), Black-tailed codwit ( <i>Limosa limosa</i> )
5	Loes river estuary	Braided stream, estuary, mudflats	41 (20)	Beach Thick-knee ( <i>Esacus giganteus</i> ), Malaysian plover ( <i>Charadrius peronii</i> )
6	Manatuto mudflats	Mudflats, mangrove, fishponds	39 (11)	Malaysian Plover ( <i>Charadrius peronii</i> )
7	Tibar aquaculture	Mudflats, mangroves, fishponds	35 (22)	Malaysian plover ( <i>Charadrius peronii</i> ), Black-tailed codwit ( <i>Limosa limosa</i> )
8	Lake Be Malae (part of IBA)	Shallow saline lake, estuary	35 (15)	Malaysian plover ( <i>Charadrius peronii</i> )
9	Dili foreshore	Beach, estuary	30 (12)	
10	Lore coast (part of IBA)	Beach, exposed reef	27 (13)	Beach thick-knee ( <i>Esacus giganteus</i> ), Malaysian plover ( <i>Charadrius peronii</i> )
11	Comoro estuary	Beach, Gravel river channel	24 (14)	Christmas Island frigatebird ( <i>Fregata andrewsi</i> ), Malaysian plover ( <i>Charadrius peronii</i> )
12	O' Swamp	Spring feed marsh, reedbed, shortgrass	23 (18)	
13	Lake Welenas and Lake Welada (part of IBA)	Freshwater lake	23 (2)	
14	Lake Eraulo	Freshwater marsh	23 (7)	Black-tailed codwit ( <i>Limosa limosa</i> )
15	Raumoko estuary	Beach, exposed reef	21 (11)	Malaysian plover ( <i>Charadrius peronii</i> )
16	Vero river (part of IBA)	Beach, exposed reef, small estuary	20 (11)	Beach thick-knee ( <i>Esacus giganteus</i> ), Malaysian plover ( <i>Charadrius peronii</i> )
17	Lake Maubara	Shallow saline lake	20 (9)	
18	Lake Selo	Freshwater marsh	18 (8)	Black-tailed codwit ( <i>Limosa limosa</i> )
19	Dili sewerage	Treatment ponds	17 (10)	
20	Jaco Island (part of IBA)	Beach, exposed reef	17 (7)	Beach thick-knee ( <i>Esacus giganteus</i> )
21	Areia Brance beach (part of IBA)	Mangrove, mudflats, beaches	17 (5)	Christmas Island Frigatebird ( <i>Fregata andrewsi</i> )
22	Lake Modo Mahut (part of IBA)	Freshwater lake	15 (3)	
23	Hera	Mangrove, mudflats, sandflats	12 (5)	Asian dowitcher ( <i>Limnodromus semipalmatus</i> )
24	Irabere estuary (part of IBA)	Beach, estuary	10 (4)	Beach thick-knee ( <i>Esacus giganteus</i> ), Malaysian plover ( <i>Charadrius peronii</i> )

In Timor Leste, coastal wetlands (and particularly the avifauna) have been relatively well-studied by BirdLife International, including bird surveys of 93 inland and coastal wetland sites (Trainor 2005, Trainor et al. 2007, 2011).

During 2005-2006, 74 wetland sites were surveyed, primarily to record aquatic bird life and their key wetland habitat (Trainor 2005). Most of these sites were concentrated on the northern and eastern coast of Timor Leste. Sixteen of these sites were identified and nominated as internationally, Important Bird Areas (IBAs) (Appendix 3.2, Table A.3.2.1) – four of these sites contain mangroves (Sungai Clere, Be Malae, Tasitolu and Areia Branca). A total of 24 key wetland sites were identified as environmentally significant at the national scale, and in need of conservation and improved management, both to support threatened and near threatened birdlife, also, to protect wetland habitat and improve the coastal protection against sea storms and inundation (Trainor et al. 2007, NBSAP 2011) (Table A.3.3.1).

During 2010, an additional 19 wetland areas were surveyed (Trainor et al. 2011):

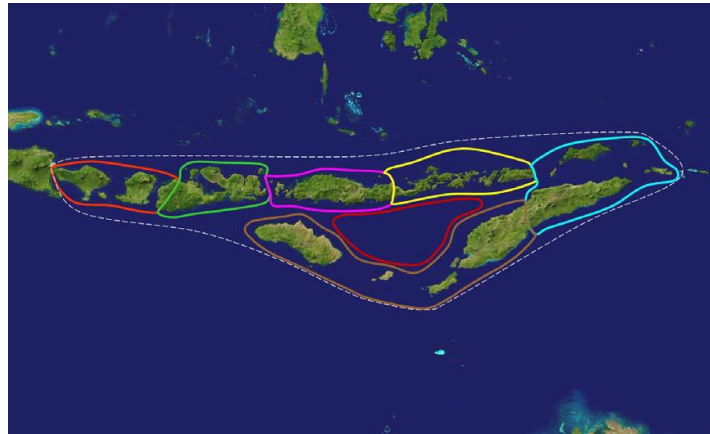
Site No.	Wetland site	Municipality	Area (ha)	Elevation (m)	Habitat
75	Lifao River estuary	Oecusse	10	0	Braided stream estuary
76	Oecussi swamp	Oecusse	200	1	Mangrove lined floodplain and short grass
77	Lake Onu Laran	Covalima	30	2	Freshwater lake (reedbed-lined)
78	Lake Asan Foun	Covalima	5	1	Saline coastal lagoons
79	Maliana ricefields	Bobonaro	300	210	Ricefields
80	Suai airfield	Covalima	100	21	Short grass
81	Queorema dam (Hatu Builico)	Ainaro	0.3	2,110	Shallow saline lake
82	Mount Manucoco, Makadade	Dili	600	600	Springs on mountain
83	Lake Welada	Manufahi	7	42	Freshwater lake, mangrove-lined
84	Lake Welenas	Manufahi	12	44	Freshwater lake, mangrove-lined
85	Sahen River channel	Manatuto	300	30	Braided stream channel
86	Lake Naan Kuro	Manatuto	100	0	Saline coastal lagoon, mangrove-lined
87	Manatuto Lake/ mangroves	Manatuto	24	0	Saline mudflats
88	Laleia River	Baucau	200	20	Braided stream channel
89	Carabella	Baucau	100	5	Short grass, ricefields
90	Parlemento-Moro	Lautem	100	0	Beach, coastal
91	Nari	Lautem	1,500	580	Short grass
92	Chin River	Lautem	20,000	360	Secondary forest, springs
93	Fuiloro	Lautem	500	420	Short grass

**Table A3.3.2.** Summary of the 19 newly surveyed Timor-Leste sites additional to the 74 sites listed in Trainor (2005)(from Trainor 2011).

## ANNEX 3.4. SEASCAPES AND REEFSCAPES

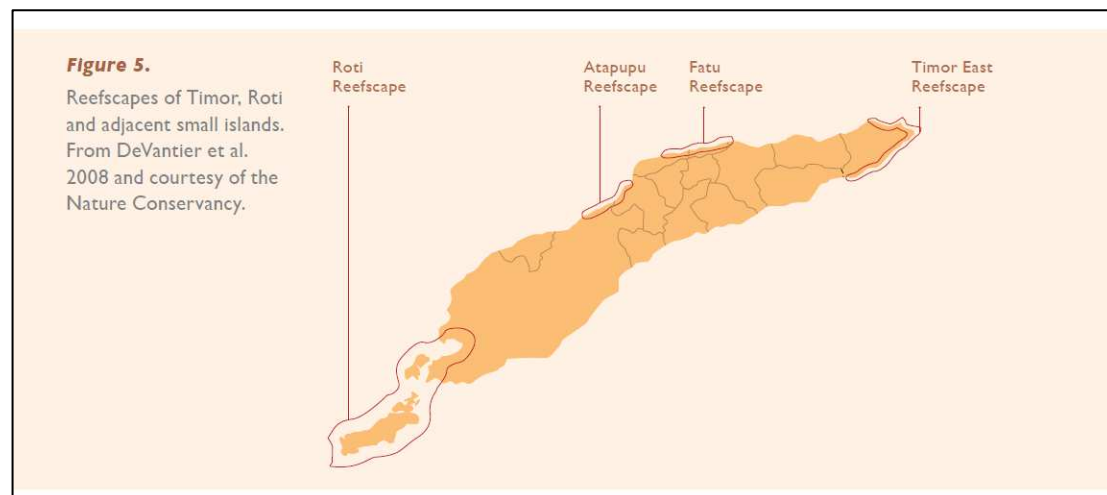
### Seascapes and Reefscapes of Timor-Leste

Within the Lesser Sunda ecoregion, seven smaller areas titled ‘seascapes’ have been defined, based on a range of oceanographic, geomorphological and biogeographic patterns<sup>10</sup>, the most eastern of which included Timor-Leste (DeVantier et al. 2008). On its northern extent, the seascape is under the influence of the Banda Sea and the smaller, semi-enclosed Wetar Strait, and on its south extent the Timor Sea.



**Figure A3.4.1.** Seascape 5, Pulau Romang – East Timor Seascape (from DeVantier et al. 2008).

Around the island of Timor itself, a further reef habitat stratification identified four ‘reefscapes’ (DeVantier et al. 2008) - three of which occur in Timor-Leste, and incorporate fringing reefs and associated seagrass and mangrove habitats: **Atapupu**, **Fatu** and **Timor East** reefscapes (see Fig. 5):



**Figure A3.4.2.** Coral ‘reefscapes’ of the island of Timor (from DeVantier et al. 2008).

<sup>10</sup> The nested stratification of the Lesser Sunda Ecoregion delineated 24 coral reefscapes nested within seven functional seascapes, using published and unpublished information and expert opinion, specifically on oceanography, bathymetry and physico-chemical parameters, habitats and distributions of corals, fishes, stomatopods, mangrove and seagrass communities and cetaceans (DeVantier et al. 2008).

## ANNEX 3.5. NOAA'S MARINE HABITAT MAPPING OF TIMOR-LESTE

### RESULTS OF WORLDVIEW2 MARINE MAPPING BY NOAA-CRED (PISC 2017)

**Table A3.5.1.** Summary of the satellite-derived bathymetry and habitat classification efforts (from PISC 2017). 'Derived Bathymetry' and 'Benthic Habitat' is the area mapped by region (km<sup>2</sup>). 'Unknown' is the area that could not be classified and is therefore excluded from the 'Benthic Habitat' area. The remaining columns in light green show the benthic habitat characterized for each region (km<sup>2</sup>) that are included in the 'Benthic Habitat' area.

Region	Derived Bathymetry (km <sup>2</sup> )	Benthic Habitat (km <sup>2</sup> )	Hard Substrate (km <sup>2</sup> )	Soft Substrate (km <sup>2</sup> )	Seagrass (km <sup>2</sup> )	Mangrove (km <sup>2</sup> )	Macroalgae (km <sup>2</sup> )	Intertidal (km <sup>2</sup> )	Emergent Rocks (km <sup>2</sup> )	Lagoon (km <sup>2</sup> )	Unknown (km <sup>2</sup> )
Atauro Island	15.1	13.1	7.1	3.6	2.4	0.1	-	-	-	-	7.7
Oecusse	19.3	12.6	3.8	6.8	2.0	< 0.1	-	-	-	-	16.8
North Shore	85.6	76.9	35.1	16.3	10.5	2.7	6.2	3.3	0.5	2.3	249.1
South Shore	-	32.7	14.3	15.3	3.0	0.1	-	-	-	-	120.0
Total	120.0	135.3	60.3	41.9	17.9	2.9	6.2	3.3	0.5	2.3	393.6

# ANNEX 3.6 OVERVIEW OF MARINE HABITAT MAPPING IN TIMOR-LESTE

## REVIEW OF NATIONAL-SCALE MARINE HABITAT MAPPING PROGRAMS IN TIMOR-LESTE

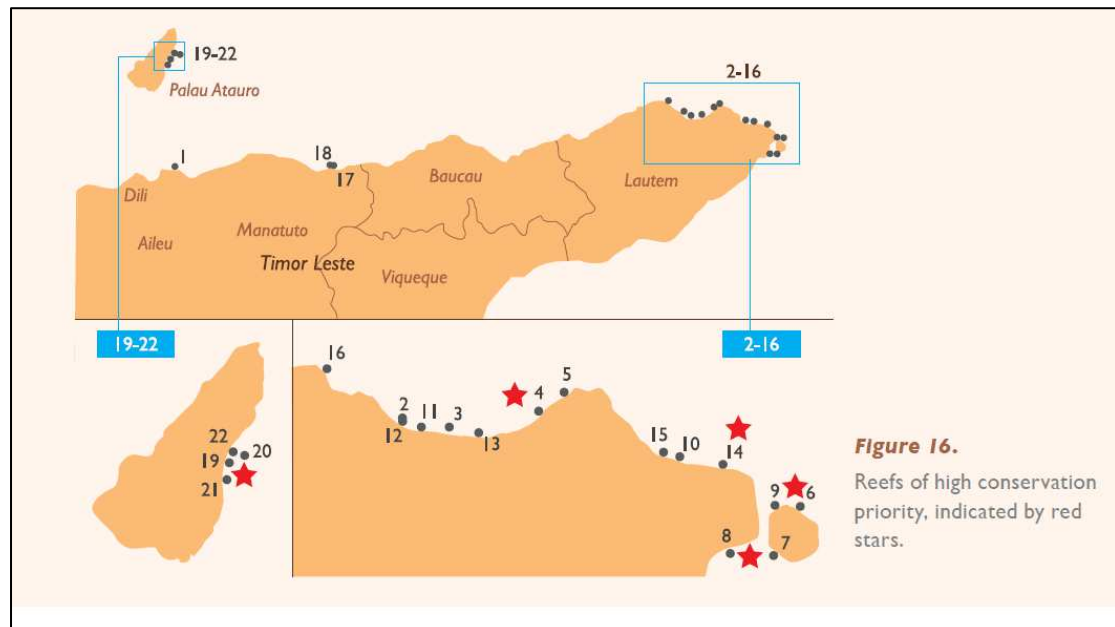
**Table A3.6.1.** Total estimated shallow, coastal-marine habitat in Timor Leste. [N=northeast coast; S=south and northwest coast]

Habitat Types	Total Area (km <sup>2</sup> ) (N + S)	Scale of Mapping	Data Source	Date of Imagery	Mapping Resolution	Partner	Publication	Comments
Hard Substrate	60.3	national	WorldView 2	(2010-14)	2m	NOAA-CRED	PISC (2017)	limited 'ground-truthing'
Coral Reefs	100	national	MCRM	-	-	-	Andrefouet et al., (2004), Grantham et al. (2011)	geomorphological classification, limited 'ground-truthing',
Coral Reefs	40.16 - 52.82 (20.16 + 12.66 <sup>#</sup> +20)	national	Landstat 5TM	(2004-8)	1:100K (30m)	CDU	Boggs et al. (2009), Lieper et al. (2013)	detailed surveys and 'ground-truthing' along the north coast only
Mangroves	13	national	Boggs et al. (2009)	NA	NA	AIMS-CDU	Alongi (2014)	review paper
Mangroves	2.9 (2.7 + 0.2)	national	WorldView 2	(2010-14)	2m	NOAA-CRED	PISC (2017)	limited 'ground-truthing'
Mangroves	8.54 (7.54 + 1)	national	Landstat 5 TM	(2004-8)	1:100K (30m)	CDU	Boggs et al. (2009), Lieper et al. (2013)	detailed floristic surveys, finer-scale mapping and 'ground-truthing' along the north coast only
Seagrasses	17.9 (10.5 + 7.4)	national	WorldView 2	(2010-14)	2m	NOAA-CRED	PISC (2017)	limited 'ground-truthing'
Seagrasses	30 (22 + 8)	national	Landstat 5TM	(2004-8)	1:100K (30m)	CDU	Boggs et al. (2009), Lieper et al. (2013)	surveys and 'ground-truthing' along the north coast only
Seagrasses	8	national	TNC	-	-	TNC	Grantham et al. (2011)	limited 'ground-truthing'
<b>Total</b>	<b>121</b>							

<sup>#</sup> 2.66 km<sup>2</sup> was classified as mixed coral-seagrass and open reef flat.



## ANNEX 3.7 HIGH CONSERVATION PRIORITY CORAL REEFS



**Figure A3.7.1.** Reefs of high conservation priority, identified during MRAP survey, Timor-Leste, August 2012 (from Turak & DeVantier 2013).

Rapid Ecological Assessment (REA) surveys were conducted using SCUBA at 20 reef locations (herein named 'stations', each with a specific GPS position) around Timor-Leste in August 2012 (Fig. 6, Annex 1).

**Table 10.** Conservation values of survey stations. Replenishment Index (CI) scores from highest to lowest; Rarity Index (RI) ranked from highest (1, most unusual faunistically) to lowest. Species richness - reef-building Scleractinia; Hard coral cover is the average of the two sites at each location (except station 22). Station numbers and community types correspond with those in Figures. High scores are bolded.

Station Name	Station No.	Replenishment Index (CI)	Rarity Index (RI)	HC Cover	Species Richness	Community Type
<b>Jako Island SW</b>	7	<b>7.1</b>	12	<b>70</b>	161	A
<b>Djonu East</b>	14	<b>6</b>	1	32.5	<b>214</b>	B
<b>Loikere</b>	4	<b>5.5</b>	4	32.5	<b>193</b>	B
<b>Jako Island NW</b>	6	<b>5.5</b>	14	<b>52.5</b>	151	A
<b>Tutuala 3 Terraces</b>	15	<b>5.3</b>	2	32.5	<b>195</b>	B
Djonu Twin Rocks	10	4.9	8	<b>42.5</b>	174	B
Ete Asa Lepek	11	4.5	13	<b>37.5</b>	144	C
Hilapuna	8	4.3	7	27.5	162	A
<b>Belio Barrier Reef</b>	19	4.2	3	27.5	<b>190</b>	B
East Loikere	5	4.1	10	30	178	B
Atauro Belio Lagoon S	21	3.6	6	20	163	C
Lamsana inlet West	18	3.4	11	25	159	C
W. Jako Island	9	3	17	35	125	A
Com Vailovaia	2	2.5	18	20	122	D
Lamsana inlet East	17	2.1	5	12.5	133	C
Atauro Belio Harbor	22	1.7	9	10	122	D
Hera West	1	1.6	16	20	95	D
Com Koto Vari	3	1.6	19	15	121	D
Belio "Saddle" Patch R.	20	1.3	15	10	139	D
Tenu. Japanese Bunker	16	0.9	20	5	114	D

**Table A3.7.1.** Reefs of high conservation priority, identified during MRAP survey, Timor-Leste, August 2012 (from Turak & DeVantier 2013).

## ANNEX 3.8 GLOBALLY THREATENED SPECIES IN TIMOR-LESTE

### KNOWN GLOBALLY THREATENED SPECIES IN TIMOR-LESTE AND THE WALLACEA REGION

**Table A3.8.1.** Numbers of globally threatened species (terrestrial and marine) in Wallacea, and totals per region and country (from CEPF 2014). CR=Critically Endangered, EN=endangered, VU=vulnerable

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

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

<sup>#</sup>Endangered reptiles include 2 species of marine turtles, including Hawksbill sea turtle (*Eretmochelys imbricata*) (CR).

<sup>\*</sup> Endangered marine mammals include 3 species of whales (see Table XX below).

**Table A3.8.2.** Globally threatened marine species in Wallacea and representation in Key Biodiversity Areas (from CEPF 2014). CR=Critically Endangered, EN=endangered, VU=vulnerable

Group & Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	No. of KBA Confirmed Presence	Adjusted Number KBAs
<b>Marine Mammals</b>							
61499	<i>Balaenoptera borealis</i>	Sei whale	EN	No	No	0	140
61501	<i>Balaenoptera musculus</i>	Blue whale	EN	No	No	2	9
61502	<i>Balaenoptera physalus</i>	Fin whale	EN	No	No	0	140
65385	<i>Dugong dugon</i>	Dugong	VU	No	No	31	48
61536	<i>Physeter macrocephalus</i>	Sperm whale	VU	No	No	3	140
<b>Marine Reptile</b>							
66263	<i>Caretta caretta</i>	Loggerhead seaturtle	EN	No	No	1	140
66264	<i>Chelonia mydas</i>	Green Sea turtle	EN	No	No	12	140

66271	<i>Dermochelys coriacea</i>	Leatherback sea turtle	VU	No	No	1	140
66265	<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	CR	No	No	14	140
66267	<i>Lepidochelys olivacea</i>	Olive Ridley sea turtle	VU	No	No	1	140
<b>Marine Fish</b>							
60691	<i>Aetomylaeus nichofii</i>	Banded eagle ray	VU	No	No	1	140
	<i>Albula glossodonta</i>	Shortjaw bonefish	VU	No	No	0	107
110881	<i>Alopias pelagicus</i>	Pelagic thresher shark	VU	No	No	0	140
	<i>Alopias superciliosus</i>	Bigeye thresher shark	VU	No	No	0	140
60605	<i>Alopias vulpinus</i>	Common thresher shark	VU	No	No	0	140
60710	<i>Anoxypristis cuspidata</i>	Knifetooth sawfish	EN	No	No	0	133
105018	<i>Bolbometopon muricatum</i>	Bumphead parrotfish	VU	No	No	12	140
60353	<i>Carcharhinus hemiodon</i>	Pondicherry shark	CR	No	No	0	140
60357	<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	VU	No	No	0	140
	<i>Carcharhinus obscurus</i>	Dusky shark	VU	No	No	0	140
60362	<i>Carcharhinus plumbeus</i>	Sandbar shark	VU	No	No	2	17
111090	<i>Chaenogaleus macrostoma</i>	Hooktooth shark	VU	No	No	0	51
53875	<i>Cheilinus undulatus</i>	Humphead wrasse	EN	No	No	28	139
53918	<i>Cromileptes altivelis</i>	Baramundi cod	VU	No	No	10	140
53933	<i>Epinephelus lanceolatus</i>	Brindle bass	VU	No	No	8	140
59087	<i>Glaucostegus typus</i>	Common shovelnose ray	VU	No	No	0	140
	<i>Himantura gerrardi</i>	Whitespotted whipray	VU	No	No	0	140
1003002	<i>Himantura leoparda</i>	Leopard whipray	VU	No	No	0	129
111078	<i>Himantura uarnak</i>	Honeycomb stingray	VU	No	No	0	140
111078	<i>Himantura undulata</i>	Bleeker's variegated whipray	VU	No	No	1	140
52892	<i>Hippocampus barbouri</i>	Barbour's seahorse	VU	No	No	0	74
52898	<i>Hippocampus comes</i>	Tiger tail seahorse	VU	No	No	1	11-100
	<i>Hippocampus histrix</i>	Spiny seahorse	VU	No	No	0	140
	<i>Hippocampus kelloggi</i>	Great seahorse	VU	No	No	0	126
52910	<i>Hippocampus kuda</i>	Common seahorse	VU	No	No	0	140

52916	<i>Hippocampus spinosissimus</i>	Hedgehog seahorse	VU	No	No	0	140
52918	<i>Hippocampus trimaculatus</i>	Flat-faced seahorse	EN	No	No	0	140
60608	<i>Isurus oxyrinchus</i>	Shortfin mako	VU	No	No	0	140
	<i>Isurus paucus</i>	Longfin mako	EN	No	No	0	140
110854	<i>Lamiopsis temmincki</i>	Broadfin shark	VU	No	No	0	10
108599	<i>Latimeria menadoensis</i>	Coelacanth	VU	No	No	3	3
1007076	<i>Makaira nigricans</i>	Blue marlin	VU	No	No	0	133
1002709	<i>Manta alfredi</i>	Coastal manta ray	VU	No	No	2	9
1014277	<i>Manta birostris</i>	Giant manta ray	VU	No	No	2	138
60621	<i>Nebrius ferrugineus</i>	Tawny nurse shark	VU	No	No	2	140
60372	<i>Negaprion acutidens</i>	Sharptooth lemon shark	VU	No	No	0	13
1002859	<i>Nemipterus virgatus</i>	Golden threadfin bream	VU	No	No	0	133
	<i>Odontaspis ferox</i>	Herbst's nurse shark	VU	No	No	0	52
106555	<i>Plectropomus areolatus</i>	Squartetail leopard grouper	VU	No	No	10	139
106556	<i>Plectropomus laevis</i>	Blacksaddled coral grouper	VU	No	No	11	134
	<i>Pristis clavata</i>	Dwarf sawfish	EN	No	No	0	140
60712	<i>Pristis pristis</i>	Largetooth sawfish	CR	No	No	0	140
60716	<i>Pristis zijsron</i>	Narrowsnout sawfish	VU	No	No	0	140
105019	<i>Pterapogon kauderni</i>	Banggai cardinalfish	VU	No	Yes	5	5
60744	<i>Rhina ancylostoma</i>	Bowmouth guitarfish	VU	No	No	0	140
60641	<i>Rhincodon typus</i>	Whale shark	VU	No	No	9	140
59095	<i>Rhinoptera javanica</i>	Flapnose ray	VU	No	No	0	140
59097	<i>Rhynchobatus australiae</i>	White-spotted Guitarfish	VU	No	No	0	40
60455	<i>Sphyrna lewini</i>	Scalloped hammerhead	EN	No	No	2	140
60457	<i>Sphyrna mokarran</i>	Great hammerhead	VU	No	No	0	14
60642	<i>Stegostoma fasciatum</i>	Leopard shark, zebra shark	VU	No	No	0	61
60672	<i>Taeniurops meyeri</i>	Black-blotched Stingray	VU	No	No	1	8
53912	<i>Thunnus maccoyii</i>	Southern bluefin tuna	VU	No	No	0	8
53913	<i>Thunnus obesus</i>	Bigeye tuna	VU	No	No	0	88
<b>Calanoidea (Crustaceans: Copepods)</b>							
50190	<i>Neodiaptomus lymphatus</i>		VU	Yes	Yes	1	1
<b>Decapoda (Crustaceans: Crabs And Shrimps etc)</b>							
<i>Caridina acutirostris</i>			VU	Yes	Yes	1	1
<i>Caridina caerulea</i>		Blue morph shrimp	VU	Yes	Yes	1	1
<i>Caridina dennerli</i>		Cardinal shrimp	EN	Yes	Yes	1	1

<i>Caridina ensifera</i>		VU	Yes	Yes	1	1
<i>Caridina glaubrechti</i>	Red orchid shrimp	EN	Yes	Yes	1	1
<i>Caridina holthuisi</i>	Matano tiger shrimp	EN	No	Yes	3	3
<i>Caridina lanceolata</i>		EN	No	Yes	3	3
<i>Caridina leclerci</i>		VU	Yes	Yes	1	1
<i>Caridina linduensis</i>		CR	Yes	Yes	1	1
<i>Caridina lingkonae</i>		EN	Yes	Yes	1	1
<i>Caridina loehae</i>	Orange delight shrimp	EN	No	Yes	3	3
<i>Caridina longidigita</i>		VU	Yes	Yes	1	1
<i>Caridina masapi</i>	Six-banded Blue Bee	EN	No	Yes	3	3
<i>Caridina parvula</i>		EN	No	Yes	2	2
<i>Caridina profundicola</i>	Sun-striped Shrimp	EN	Yes	Yes	1	1
<i>Caridina sarasinorum</i>		VU	Yes	Yes	1	1
<i>Caridina schenkeli</i>		VU	Yes	Yes	1	1
<i>Caridina spinata</i>	Red gold flake shrimp	EN	Yes	Yes	1	1
<i>Caridina spongicola</i>	Celebes beauty	EN	Yes	Yes	1	1
<i>Caridina striata</i>	Red-lined Shrimp	EN	No	Yes	2	2
<i>Caridina tenuirostris</i>	White orchid bee	EN	No	Yes	2	2
<i>Caridina woltereckae</i>	Harlequin shrimp	EN	Yes	Yes	1	1
<i>Marosina brevirostris</i>		VU	Yes	Yes	1	1
<i>Marosina longirostris</i>		VU	Yes	Yes	1	1
<i>Migmathelphusa olivacea</i>		EN	Yes	Yes	1	1
<i>Nautilothelphusa zimmeri</i>		VU	No	Yes	3	3
<i>Parathelphusa crocea</i>		VU	Yes	Yes	1	1
<i>Parathelphusa pantherina</i>		VU	Yes	Yes	1	1
<i>Parathelphusa possoensis</i>		VU	Yes	Yes	1	1
<i>Parisia deharvengi</i>		VU	Yes	Yes	1	1
<i>Sundathelphusa minahassae</i>		VU	No	Yes	2	2

Coral							
Group & Species Code	Scientific Name	Common Name	Red List Category	Single Site Endemic	Wallacea Endemic?	Num of KBA Confirmed Presence	Adjusted Number KBAs
107186	<i>Acanthastrea bowerbanki</i>	Coral	VU	No	No	0	7
107295	<i>Acanthastrea brevis</i>	Coral	VU	No	No	7	140
107354	<i>Acanthastrea faviaformis</i>	Coral	VU	No	No	6	140
105998	<i>Acanthastrea hemprichii</i>	Coral	VU	No	No	12	140
106762	<i>Acanthastrea ishigakiensis</i>	Coral	VU	No	No	3	140
107120	<i>Acanthastrea regularis</i>	Coral	VU	No	No	11	140
106960	<i>Acropora abrolhosensis</i>	Coral	VU	No	No	3	140
107222	<i>Acropora aculeus</i>	Coral	VU	No	No	10	140
106741	<i>Acropora acuminata</i>	Coral	VU	No	No	6	140
107267	<i>Acropora anthocercis</i>	Coral	VU	No	No	7	140
106959	<i>Acropora aspera</i>	Coral	VU	No	No	9	140
107319	<i>Acropora awi</i>	Coral	VU	No	No	3	140
107079	<i>Acropora batunai</i>	Coral	VU	No	No	3	140
106940	<i>Acropora caroliniana</i>	Coral	VU	No	No	4	140

107116	<i>Acropora dendrum</i>	Coral	VU	No	No	4	140
106845	<i>Acropora derawanensis</i>	Coral	VU	No	No	3	140
107174	<i>Acropora desalwii</i>	Coral	VU	No	No	5	140
107036	<i>Acropora donei</i>	Coral	VU	No	No	6	140
107379	<i>Acropora echinata</i>	Coral	VU	No	No	10	140
107393	<i>Acropora elegans</i>	Coral	VU	No	No	4	140
107167	<i>Acropora globiceps</i>	Coral	VU	No	No	7	140
106842	<i>Acropora hoeksemai</i>	Coral	VU	No	No	6	140
107177	<i>Acropora horrida</i>	Coral	VU	No	No	7	140
107113	<i>Acropora indonesia</i>	Coral	VU	No	No	7	140
107333	<i>Acropora jacquelineae</i>	Coral	VU	No	No	2	140
107348	<i>Acropora kimbeensis</i>	Coral	VU	No	No	4	139
107045	<i>Acropora kirstyae</i>	Coral	VU	No	No	0	140
106915	<i>Acropora kosurini</i>	Coral	VU	No	No	0	52
107256	<i>Acropora listeri</i>	Coral	VU	No	No	7	140
106831	<i>Acropora loisetiae</i>	Coral	VU	No	No	0	140
107173	<i>Acropora lokani</i>	Coral	VU	No	No	4	140
107089	<i>Acropora lovelli</i>	Coral	VU	No	No	1	10
107121	<i>Acropora microclados</i>	Coral	VU	No	No	11	140
107151	<i>Acropora multiacuta</i>	Coral	VU	No	No	1	140
106851	<i>Acropora palmerae</i>	Coral	VU	No	No	3	140
107282	<i>Acropora paniculata</i>	Coral	VU	No	No	9	140
106833	<i>Acropora papillare</i>	Coral	VU	No	No	8	140
107250	<i>Acropora plumosa</i>	Coral	VU	No	No	2	140
106736	<i>Acropora polystoma</i>	Coral	VU	No	No	9	140
107366	<i>Acropora retusa</i>	Coral	VU	No	No	1	140
106943	<i>Acropora russelli</i>	Coral	VU	No	No	2	140
106629	<i>Acropora simplex</i>	Coral	VU	No	No	1	140
107114	<i>Acropora solitaryensis</i>	Coral	VU	No	No	7	140
107132	<i>Acropora speciosa</i>	Coral	VU	No	No	6	140
107196	<i>Acropora spicifera</i>	Coral	VU	No	No	4	140
107086	<i>Acropora striata</i>	Coral	VU	No	No	3	140
107020	<i>Acropora tenella</i>	Coral	VU	No	No	3	140
106723	<i>Acropora turaki</i>	Coral	VU	No	No	4	140
106875	<i>Acropora vaghani</i>	Coral	VU	No	No	7	140
107283	<i>Acropora verweyi</i>	Coral	VU	No	No	5	140
107203	<i>Acropora walindii</i>	Coral	VU	No	No	0	140

106371	<i>Acropora willisae</i>	Coral	VU	No	No	5	140
107126	<i>Alveopora allingi</i>	Coral	VU	No	No	2	140
106926	<i>Alveopora daedalea</i>	Coral	VU	No	No	1	140
107223	<i>Alveopora excelsa</i>	Coral	VU	No	No	0	140
107274	<i>Alveopora fenestrata</i>	Coral	VU	No	No	3	140
107257	<i>Alveopora gigas</i>	Coral	VU	No	No	5	73
106710	<i>Alveopora marionensis</i>	Coral	VU	No	No	1	140
106977	<i>Alveopora verrilliana</i>	Coral	VU	No	No	2	140
106834	<i>Anacropora matthai</i>	Coral	VU	No	No	4	140
107190	<i>Anacropora puertogalerae</i>	Coral	VU	No	No	5	140
107394	<i>Anacropora reticulata</i>	Coral	VU	No	No	3	140
106613	<i>Anacropora spinosa</i>	Coral	VU	No	No	3	140
106903	<i>Astreopora cucullata</i>	Coral	VU	No	No	10	140
106925	<i>Astreopora incrustans</i>	Coral	VU	No	No	3	140
107350	<i>Australogyra zelli</i>	Coral	VU	No	No	0	140
107163	<i>Barabattoia laddi</i>	Coral	VU	No	No	10	140
106704	<i>Catalaphyllia jardinei</i>	Coral	VU	No	No	1	140
107399	<i>Caulastrea curvata</i>	Coral	VU	No	No	4	140
107253	<i>Caulastrea echinulata</i>	Coral	VU	No	No	2	140
107358	<i>Cyphastrea agassizi</i>	Coral	VU	No	No	10	140
107115	<i>Cyphastrea ocellina</i>	Coral	VU	No	No	8	139
107375	<i>Echinophyllia costata</i>	Coral	VU	No	No	3	140
106732	<i>Echinopora ashmorensis</i>	Coral	VU	No	No	4	140
106992	<i>Euphyllia ancora</i>	Coral	VU	No	No	11	140
107323	<i>Euphyllia cristata</i>	Coral	VU	No	No	10	140
107084	<i>Euphyllia paraancora</i>	Coral	VU	No	No	2	140
106892	<i>Euphyllia paradivisa</i>	Coral	VU	No	No	4	140
107040	<i>Euphyllia paraglabrescens</i>	Coral	VU	No	No	1	11-100
106713	<i>Favia rosaria</i>	Coral	VU	No	No	2	140
107313	<i>Favites spinosa</i>	Coral	VU	No	No	1	11-100
101065	<i>Fungia curvata</i>	Coral	VU	No	No	0	140
106826	<i>Fungia taiwanensis</i>	Coral	VU	No	No	1	133
106937	<i>Galaxea achrhelia</i>	Coral	VU	No	No	5	140
107147	<i>Galaxea astreata</i>	Coral	VU	No	No	7	140
106869	<i>Galaxea cryptoramosa</i>	Coral	VU	No	No	3	140
107269	<i>Goniastrea ramosa</i>	Coral	VU	No	No	4	140
106755	<i>Goniopora albiconus</i>	Coral	VU	No	No	7	140



107170	<i>Goniopora burgosi</i>	Coral	VU	No	No	3	140
106856	<i>Goniopora planulata</i>	Coral	VU	No	No	2	140
106864	<i>Goniopora polyformis</i>	Coral	VU	No	No	1	140
106830	<i>Halomitra clavator</i>	Coral	VU	No	No	5	140
106326	<i>Heliopungia actiniformis</i>	Coral	VU	No	No	14	140
107011	<i>Heliopora coerulea</i>	Coral	VU	No	No	17	140
107001	<i>Isopora brueggemanni</i>	Coral	VU	No	No	10	140
107230	<i>Isopora crateriformis</i>	Coral	VU	No	No	4	140
107378	<i>Isopora cuneata</i>	Coral	VU	No	No	9	15
107335	<i>Isopora togianensis</i>	Coral	VU	No	No	0	53
107291	<i>Leptastrea aequalis</i>	Coral	VU	No	No	0	140
107104	<i>Leptoria irregularis</i>	Coral	VU	No	No	2	140
107288	<i>Leptoseris incrustans</i>	Coral	VU	No	No	8	140
106970	<i>Leptoseris yabei</i>	Coral	VU	No	No	6	140
107302	<i>Lobophyllia dentatus</i>	Coral	VU	No	No	5	140
107349	<i>Lobophyllia diminuta</i>	Coral	EN	No	No	2	102
107038	<i>Lobophyllia serratus</i>	Coral	VU	No	No	2	140
	<i>Millepora boschmai</i>	Coral	VU	No	No	0	51
106760	<i>Montastrea multipunctata</i>	Coral	VU	No	No	0	140
106983	<i>Montastrea salebrosa</i>	Coral	VU	No	No	9	140
107400	<i>Montipora altasepta</i>	Coral	VU	No	No	2	140
106683	<i>Montipora angulata</i>	Coral	VU	No	No	2	140
107205	<i>Montipora australiensis</i>	Coral	VU	No	No	1	140
106941	<i>Montipora cactus</i>	Coral	VU	No	No	4	140
107004	<i>Montipora calcarea</i>	Coral	VU	No	No	7	25
107034	<i>Montipora caliculata</i>	Coral	VU	No	No	14	140
106625	<i>Montipora capricornis</i>	Coral	VU	No	No	1	140
107353	<i>Montipora cebuensis</i>	Coral	VU	No	No	7	140
107219	<i>Montipora cocosensis</i>	Coral	VU	No	No	3	140
106761	<i>Montipora corbettensis</i>	Coral	VU	No	No	6	140
107197	<i>Montipora crassituberculata</i>	Coral	VU	No	No	7	140
107246	<i>Montipora delicatula</i>	Coral	VU	No	No	3	140

106898	<i>Montipora florida</i>	Coral	VU	No	No	3	140
106958	<i>Montipora friabilis</i>	Coral	VU	No	No	2	140
106370	<i>Montipora gaimardi</i>	Coral	VU	No	No	2	140
106706	<i>Montipora hodgsoni</i>	Coral	VU	No	No	5	140
107198	<i>Montipora mactanensis</i>	Coral	VU	No	No	4	140
106858	<i>Montipora malampaya</i>	Coral	VU	No	No	4	140
106913	<i>Montipora meandrina</i>	Coral	VU	No	No	2	23
106372	<i>Montipora orientalis</i>	Coral	VU	No	No	1	140
107180	<i>Montipora samarensis</i>	Coral	EN	No	No	2	140
107153	<i>Montipora setosa</i>	Coral	EN	No	No	0	7
107210	<i>Montipora turtlensis</i>	Coral	VU	No	No	7	140
107184	<i>Montipora verruculosus</i>	Coral	VU	No	No	3	140
107008	<i>Montipora vietnamensis</i>	Coral	VU	No	No	9	140
106687	<i>Moseleya latistellata</i>	Coral	VU	No	No	0	140
107129	<i>Mycidium steeni</i>	Coral	VU	No	No	1	140
107033	<i>Nemanzophyllia turbida</i>	Coral	VU	No	No	1	140
107381	<i>Pachyseris involuta</i>	Coral	VU	No	No	0	4
107213	<i>Pachyseris rugosa</i>	Coral	VU	No	No	6	140
107152	<i>Pavona bipartita</i>	Coral	VU	No	No	7	140
107296	<i>Pavona cactus</i>	Coral	VU	No	No	11	140
107068	<i>Pavona danai</i>	Coral	VU	No	No	0	140
106888	<i>Pavona decussata</i>	Coral	VU	No	No	11	139
106696	<i>Pavona venosa</i>	Coral	VU	No	No	14	140
106820	<i>Pectinia alcornis</i>	Coral	VU	No	No	4	140
106368	<i>Pectinia lactuca</i>	Coral	EN	No	No	18	140
107389	<i>Pectinia maxima</i>	Coral	VU	No	No	4	140
107216	<i>Physogyra lichtensteini</i>	Coral	VU	No	No	14	140
106901	<i>Platygyra yaeyamaensis</i>	Coral	VU	No	No	13	140
106835	<i>Plerogyra discus</i>	Coral	VU	No	No	0	140
106862	<i>Pocillopora ankei</i>	Coral	VU	No	No	5	140
106929	<i>Pocillopora danae</i>	Coral	VU	No	No	9	140
101074	<i>Pocillopora elegans</i>	Coral	VU	No	No	1	140
106973	<i>Porites araneai</i>	Coral	VU	No	No	1	140
106935	<i>Porites attenuata</i>	Coral	VU	No	No	8	140
107255	<i>Porites cocosensis</i>	Coral	VU	No	No	1	140
106951	<i>Porites cumulatus</i>	Coral	EN	No	No	3	140
106711	<i>Porites eridani</i>	Coral	VU	No	No	0	140

107243	<i>Porites horizontalata</i>	Coral	VU	No	No	10	140
107150	<i>Porites napopora</i>	Coral	VU	No	No	1	140
106885	<i>Porites nigrescens</i>	Coral	EN	No	No	18	139
107096	<i>Porites ornata</i>	Coral	VU	No	No	1	140
107305	<i>Porites rugosa</i>	Coral	VU	No	No	4	140
106946	<i>Porites sillimaniana</i>	Coral	VU	No	No	3	140
107091	<i>Porites tuberculosa</i>	Coral	VU	No	No	8	140
101052	<i>Psammocora stellata</i>	Coral	EN	No	No	1	12
107277	<i>Seriatopora aculeata</i>	Coral	VU	No	No	3	140
107199	<i>Seriatopora dendritica</i>	Coral	EN	No	No	6	140
106968	<i>Stylocoeniella cocosensis</i>	Coral	EN	No	No	0	140
106953	<i>Symphyllia hassi</i>	Coral	VU	No	No	7	140
106821	<i>Turbinaria bifrons</i>	Coral	VU	No	No	0	140
107047	<i>Turbinaria heronensis</i>	Coral	VU	No	No	0	140
107363	<i>Turbinaria mesenterina</i>	Coral	VU	No	No	15	140
106996	<i>Turbinaria patula</i>	Coral	VU	No	No	1	140
107254	<i>Turbinaria peltata</i>	Coral	VU	No	No	7	140
107401	<i>Turbinaria reniformis</i>	Coral	VU	No	No	12	140
107179	<i>Turbinaria stellulata</i>	Coral	VU	No	No	7	140
Marine Molluscs							
66671	<i>Tridacna derasa</i>	Giant clam	VU	No	No	2	140
66672	<i>Tridacna gigas</i>	Giant clam	VU	No	No	4	140
Sea Cucumber							
<i>Actinopyga echinites</i>		Brownfish, deep water redfish	VU	No	No	0	140
<i>Actinopyga mauritiana</i>		Surf redfish	VU	No	No	0	140
<i>Actinopyga miliaris</i>		Blackfish, hairy blackfish	VU	No	No	0	140
<i>Holothuria fuscogilva</i>		White teatfish	VU	No	No	4	134
<i>Holothuria lessoni</i>		Golden sandfish	EN	No	No	2	140
<i>Holothuria nobilis</i>		Black teatfish	EN	No	No	0	7
<i>Holothuria scabra</i>		Golden sandfish, sandfish	EN	No	No	0	140
<i>Holothuria whitmaei</i>		Black teatfish	EN	No	No	0	28
<i>Stichopus herrmanni</i>		Curryfish	VU	No	No	0	140
<i>Thelenota ananas</i>		Prickly redfish	EN	No	No	1	139

## ANNEX 3.9 PROTECTED AQUATIC SPECIES IN TIMOR-LESTE

This Joint Ministerial Order (proclaimed 12 April 2017) establishes the List of Protected Aquatic Species. Protection of aquatic species is essential to preserve biodiversity in national waters and must comply with scientific criteria and the need to protect certain species. To this end, it is necessary to harmonize the list of protected aquatic species in Timor-Leste with current international standards. This Joint Order in particular, lays down the list of protected aquatic species within national maritime waters.

**Table A3.9.1.** Joint Ministerial Order No.18/MAP/MCIA/II/2017 establishing the List of Protected Aquatic Species.

NAME				STATUS	COMMENTS
LOCAL	PORTUGUESE	ENGLISH	LATIN		
<i>Niru baliun</i>	<i>Bodião napoleão</i>	Maori wrasse	<i>Cheilinus Undulatus</i>	Threatened	
<i>Toninho</i>	<i>Golfinho</i>	Dolphin	<i>Delphinidae</i>	Threatened	All Species Except for authorised recreational activities.
<i>Baleia</i>	<i>Baleia, Cachalote, Baleote</i>	Whale	<i>Balaenidae</i>	Threatened	All Species
<i>Lenuk Tasi</i>	<i>Tartaruga</i>	Sea turtle	<i>Chelonioidae</i>	Threatened	All Species
<i>Ahu Ruin (funan no isin) / Ai-metan Tasi / Esponja</i>	<i>Coral</i>	Coral	<i>Anthozoa</i>	Threatened	All Species
<i>Duju/Karau-Tasi</i>	<i>Dugongo</i>	Dugong	<i>Dugong dugong</i>	Threatened	All Species
<i>Sipu mutiara</i>	<i>Ostra perlifera</i>	Pearl oyster	<i>Pinctada maxima</i>	Threatened	Except pearl oysters from properly authorized commercial holdings.
<i>Sipu kima</i>	<i>Ostra gigante</i>	Giant Clam	<i>Tridacna gigas</i>	Threatened	
<i>Sipu bo'ot</i>	<i>Ameijoa gigante</i>	Small Giant Clam	<i>Tridacna maxima</i>	Threatened	
<i>Sipu Kuda Ain-Fatin</i>	<i>Ameijoa gigante</i>	Horse hof	<i>Hippopus hippopus</i>	Threatened	
<i>Sipu Tarak</i>	<i>Ameijoa gigante de escamas</i>	Scaly Clam	<i>Tridacna squamosa</i>	Threatened	
<i>Sipu Sul</i>	<i>Ameijoa gigante do sul</i>	Southern Giant Clam	<i>Tridacna derasa</i>	Threatened	
<i>Sipu Asafrun/kinur</i>	<i>Ameijoa gigante cor de açafraão</i>	Saffron-Colored Giant Clam	<i>Tridacna crocea</i>	Threatened	
<i>Tubaraun Kadó</i>	<i>Tubarão serra</i>	Sawfish	<i>Pristis microdon</i>	Critically Endangered	
<i>Tubaraun Makikit</i>	<i>Tubarão águia</i>	Porbeagle Shark	<i>Lamna nasus</i>	Threatened	
<i>Tubaraun Mutin</i>	<i>Tubarão branco</i>	Great White Shark	<i>Carcharodon Carcharias</i>	Threatened	

<i>Tubaraun Koboy</i>	<i>Galha-branca-oceânico</i>	Oceanic White tip Shark	<i>Carcharinus Longimanus</i>	Threatened	
	<i>Tubarão martelo</i>	Scalloped Hammerhead Shark	<i>Sphyrna lewini</i>	Threatened	
	<i>Tubarão martelo</i>	Great Hammerhead Shark	<i>Sphyrna mokarran</i>	Threatened	
	<i>Tubarão martelo</i>	Smooth Hammerhead Shark	<i>Sphyrna zygaena</i>	Threatened	
	<i>Tubarão baleia</i>	Whale shark	<i>Rhincodon typus</i>	Threatened	
	<i>Tubarão fera</i>	Breaking Shark	<i>Cetorhinus maximus</i>	Threatened	
	<i>Tubarão Espada</i>	Pelagic Thresher Shark	<i>Alopias pelagicus</i>	Threatened	
		Bigeye Thresher	<i>Alopias superciliosus</i>	Threatened	
		Common Thresher	<i>Alopias vulpinus</i>	Threatened	
<i>Pari bo'ot tasi klean</i>	<i>Raia Manta/Jamanta gigante</i>	Giant Manta Ray	<i>Manta birostris</i>	Threatened	
<i>Pari bo'ot tasi badak</i>	<i>Manta/Jamanta Princepe Alfred</i>	Manta Ray (Alfredi)	<i>Manta alfredi</i>	Threatened	
<i>Pari makerek</i>	<i>Ratão pintado</i>	Spotted Eagle Ray	<i>Aetobatus narinari</i>	Threatened	
<i>Nautilus</i>	<i>Náutilo</i>	Nautilus	<i>Nautilidae</i>	Threatened	<i>All Species</i>
<i>Crocodilo/Lafaek</i>	<i>Crocodilo</i>	Crocodile	<i>Crocodylidae</i>	Threatened	<i>All Species Except crocodiles from properly authorized commercial farms.</i>

From *Jornal da Republica* (Serie I, No.4), 12 April 2017.

**Note:** Draft Decree Law on Biodiversity (circulated March 2012), Annexure I, Interim List of Protected species (draft for Consultation), also lists all species of Cowry/Cowrie (Cypraeidae) and Sea horses and Pipefish (all species) (Syngnathidae). And significantly, "All other species listed in Appendix I or Appendix II of the Convention on the International Trade in Endangered Species (CITES), and the IUCN Red List."

## ANNEX 3.10 DUGONG AND SEAGRASS CONSERVATION PROJECT

### PROJECT SUMMARY

The **Dugong and Seagrass Conservation Project** objective is: “to enhance the effectiveness of conservation of dugongs and their seagrass ecosystems across the Indian and Pacific Ocean basins”. <http://www.dugongconservation.org/where-we-work/timor-leste/> -

The project will enhance the effectiveness of conservation efforts for dugongs and their seagrass ecosystems across the Indian and Pacific Ocean basins through specific actions in eight countries and wider regional and global activities (funded by GEF and co-financing).

This will be achieved through community based stewardship at key sites for dugongs; increases in sustainable fisheries practices including the use of innovative incentives and tools; increases in availability of critical knowledge for conservation action for dugongs and seagrass; and mainstreaming dugong and seagrass conservation priorities into national and regional policies and planning.

This project represents the first coordinated approach across a wide range of countries towards the conservation of dugongs and their seagrass habitats. In addition, tools and lessons learned will be shared across the project stakeholders and globally through information sharing via a Clearing House Mechanism and the Dugong, Seagrass and Coastal Communities Initiative under the CMS Dugong MoU.

### Timor-Leste Activities Funded Under the Project:

TL 1	Identification of priority sites for conservation of dugongs and seagrasses in Timor Leste. CI (MAF-MCIA)	US\$88,353
TL 2	Incentivising community engagement in dugong and seagrass conservation in Timor Leste through volunteer ecotourism. Blue Ventures (MAF-MCIA-Tourism)	US\$380,000
TL 3	Mainstreaming dugong and their seagrass habitats in national coastal zone planning and decision-making. CI (MAF)	US\$100,000
TL 4	National-level awareness campaign to champion dugong and seagrass conservation - MCIA (MAF-CI-Blue Ventures).	US\$200,000
TL 5	Timor Leste National Facilitating Committee - MCIA	US\$61,000
		<b>US\$829,353</b>

## **Identification of priority sites for conservation of dugongs and seagrasses in Timor-Leste (TL1) - \$88,353**

This project aims to identify priority sites for dugong and seagrass conservation efforts in Timor-Leste. Considered sacred animals in this area, dugongs are not actively hunted; however the species and its habitat do suffer degradation as a result of poor fishing practices, coastal planning, boat strikes, etc.

Substantial knowledge gaps regarding the distribution and abundance of dugongs and seagrass in Timor-Leste act as a barrier to conservation efforts. Therefore, information regarding the location, size and characteristics of key feeding habitats for dugongs is urgently needed as no such information currently exists.

TL1 will utilise several different means of data collection, including fisher sightings (especially any incidental by-catches), general observations and reports of incidents of human–wildlife interactions. Information concerning community relationships with dugongs and the locations and species of seagrasses will also be collected. A broad range of stakeholders (volunteers, community members, NGO and government staff) will be involved in the data collection to ensure effective knowledge-sharing.

By supporting the government and local communities to undertake and develop ongoing monitoring programs, this project will enable adaptive management and planning, and build capacity to protect livelihoods, increase food security and ensure the long-term sustainability of the local environment.

### **DELIVERABLES FOR TL1:**

1. Achieve active community-based management of the dugong/seagrass ecosystem in at least one site; and ensure at least one community is actively monitoring dugong and seagrasses in the local environment.
2. Propose the selected area and a draft management plan at *Suco* [village] and district level for integration into *Suco*.
3. Contribute to a national database by collecting data on fisher sightings, such as incidental by-catches, dugong occurrence, human–wildlife conflicts, community–dugong relationships, and seagrass species and locations.
4. Build national and local capacity (of at least 10 community members) for dugong and seagrass monitoring in the local environment through surveys and drone surveillance.
5. Build national capacity for quality control in data collection.

## ANNEX 3.11 INDICATORS OF MARINE ECOSYSTEM CONDITION

### INDICATORS OF MARINE ECOSYSTEM CONDITION

#### NOAA-CREP (PISC 2017) – climate monitoring (10 sites)

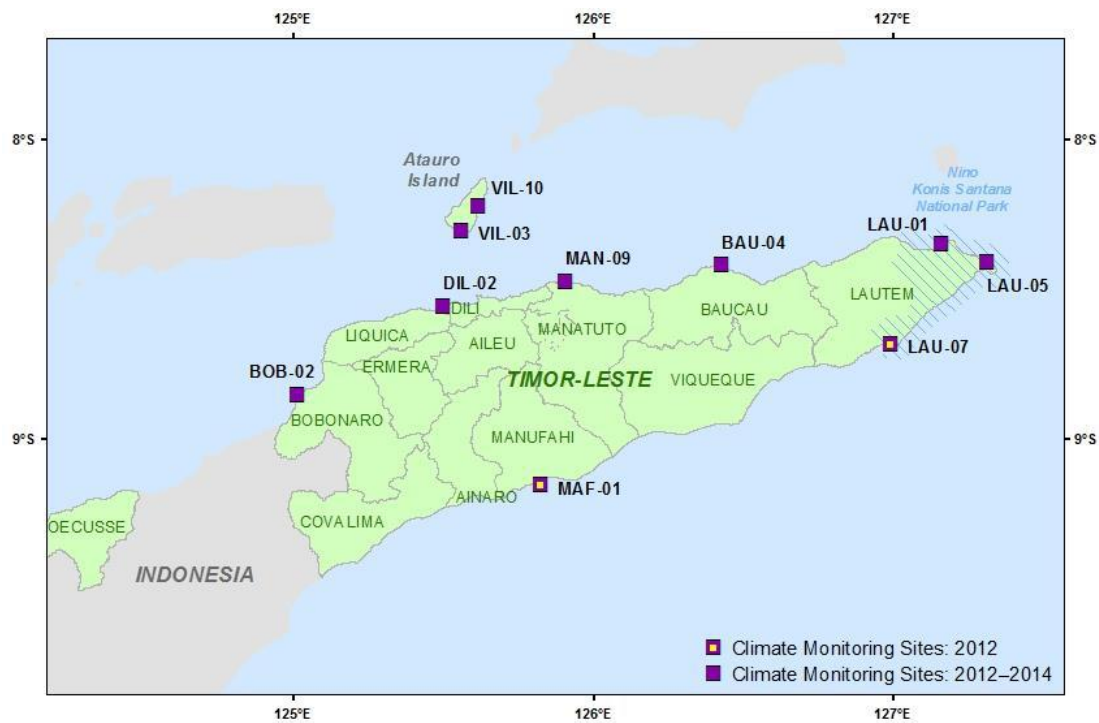
Interdisciplinary physical, chemical, and ecological observations were collected at Climate Monitoring Sites around Timor-Leste to establish baseline measurements for tracking ecological responses to climate change and ocean acidification projected over the coming decades. Ten Climate Monitoring Sites (Figure A3.11.1) were selected in consultation with local resource management agencies as areas of special management interest, such as potential Marine Managed Areas or Marine Protected Areas.

At each of these sites, temperature, carbonate chemistry (i.e. ocean acidification), biodiversity, and calcium carbonate accretion rates were measured, providing a foundation to understand present-day spatial patterns and a baseline for monitoring and detecting long-term responses to climate change.

The spatial information on the parameters provided here can assist in the development of climate change vulnerability assessments to further inform coastal resource managers and policy makers as they develop climate adaptation plans for the coastal communities of Timor-Leste. Furthermore, these data will be integrated into a broader regional effort focused on establishing baselines and monitoring the ecological impacts of ocean acidification on coral reefs by the Intergovernmental Oceanographic Commission for the Western Pacific region (WESTPAC). In 2015, eight WESTPAC nations (Philippines, Indonesia, Malaysia, Vietnam, China, Bangladesh, Cambodia, and Thailand) committed to the implementation of 21 Climate Monitoring Sites using adopted methodologies that were executed in Timor-Leste. Thus, the Timor-Leste Climate Monitoring Sites, in conjunction with the ~50 Climate Monitoring Sites already established by NOAA-CREP's Pacific Reef Assessment and Monitoring Program, plus the 21 sites established by WESTPAC nations, will foster important comparative analyses across gradients of biodiversity, human impacts, and oceanographic/environmental conditions for better understanding the impacts of climate change.

- seawater temperature from subsurface temperature recorder (STRs)
- reef calcification rate from Calcification Accretion Units (CAUs)
- marine invertebrate biodiversity from Autonomous Reef Monitoring Structures (ARMS)
- carbonate chemistry from seawater samples (Ocean Acidification)
- and benthic cover from photographs of the seafloor.





**Figure A3.11.1.** Map showing the location of the 10 Climate Monitoring sites established in October 2012, and the 2 sites that were not revisited after the first year.

Significantly, benthic cover data from the NOAA CREP Coral Reef Assessment (June 2013) also can be used for detecting changes in reef condition due to other non-climate anthropogenic impacts. For example, ‘benthic substrate ratio’, defined as the ratio of the sum of coral (hard and soft) and crustose coralline algae (CCA), divided by the sum of turf and fleshy macroalgae, is often used as a metric of coral reef condition (Houk et al. 2010).

## ANNEX 4.I DATASETS USED IN PREVIOUS PROTECTED AREA PLANNING

**Table A4.I.I.** Summary of data (and source) used in the National Ecological Gap Assessment (NEGA) for the TL Protected Area Network (PAN) (from Grantham et al. 2011).

Data	Sources
Land types	ALGIS (Geoformations), UNDP SLM project (landcover)
Rivers	ALGIS
Estuaries	The Nature Conservancy
Coral Reefs	Millenium Ecosystem Mapping Project (University of Miami)
Broad marine classes	GEBCO
Mangroves	The Nature Conservancy
Seagrasses	The Nature Conservancy
Carbon	Ruesch et al.
Records of birds of conservation concern	Colin Trainor (Charles Darwin University)
Important Bird Areas	Birdlife International
Important wetlands for birds	Colin Trainor (Charles Darwin University)
Important sites for reptiles and frogs	Heinrich Kaiser (Victor Valley College)
Important site for orchids	Paulo Silveira (Universidade de Aveiro)
<i>Chelodina timorensis</i> (turtle)	McCord et al. (2007) Reptilia
<i>Crateroscephalus Laisapi</i> (fish)	Helen K. Larson (Museum and Art Gallery of the Northern Territory)
Biological survey of protected areas	Fernando Santana (DPANP)
Household points (2004)	ALGIS
Mining	ALGIS
Roads	ALGIS

**Table A4.1.2.** List of data layers used in Lesser Sunda Ecoregon MPA network planning (from Wilson et al. 2011, Appendix A).

Category	Description	File name	Source	Appendix
<b>Base GIS Layers</b>				
Administrative boundaries	Provincial and district boundaries - Bali	bli_admin_line	Department of Spatial Planning	
	Provincial and district boundaries – West Nusa Tenggara	ntb_admin_line	Department of Spatial Planning	
	Provincial and district boundaries - East Nusa Tenggara and Timor-Leste	ntt_admin_line	Department of Spatial Planning	
	Coastline - Bali	bli_landdistrict_poly	Department of Spatial Planning	
	Coastline – West Nusa Tenggara	ntb_landdistrict_poly	Department of Spatial Planning	
	Coastline – East Nusa Tenggara	ntt_landdistrict_poly	Department of Spatial Planning	
	Lesser Sunda Ecoregion boundary	lse_ecoregion20080930_poly	TNC	
Existing MPAs and coastal reserves	Boundaries of existing MPAs, coastal reserves and 'areas of interest'	lse_mpanetwork_line lse_mpanetwork_poly	Department of Fisheries and Department of Forestry	
<b>Shallow coastal habitats</b>				
Coral reefs	Coral reef outline	lse_coralreef_poly	Torres-Pulliza 2008	B1
	Reef Scapes		DeVantier et al. 2008	B2
Coral reef classification – exposure, reef zone	Exposed, North facing fringing and rocky shores	lse_reefscapegeneral_poly	DeVantier et al. 2008	B3
	North influence and semi exposed patch reefs	lse_reefscapegeneral_poly	DeVantier et al. 2008	B3
	Exposed, South influence fringing and rocky shores	lse_reefscapegeneral_poly	DeVantier et al. 2008	B3
	Very sheltered habitats, inlets	lse_reefscapegeneral_poly	DeVantier et al. 2008	B3
Coral reef classification - geomorphology	Deep reef feature	lse_reefscapecdetail_poly	Torres – Pulliza 2008	B4
	Forereef slope	lse_reefscapecdetail_poly	Torres – Pulliza 2008	B4
	Reef flat	lse_reefscapecdetail_poly	Torres – Pulliza 2008	B4
	Reef lagoonal terrace	lse_reefscapecdetail_poly	Torres – Pulliza 2008	B4
Seagrass	Sparse to medium	lse_seagrass_poly	Torres – Pulliza 2008	B5
	Medium to dense	lse_seagrass_poly	Torres – Pulliza 2008	B5

Mangrove	Mangrove outline	lse_mangroves_poly	Digitized from satellite imagery	B6
Estuary	Estuary outline	lse_estuary_poly	Digitized from satellite imagery	B6
Straits	Straits outline*	lse_strait_poly	Kahn 2008	C1
Satellite Islands	Offshore islands outline*	lse_satelliteislands_poly	Kahn 2008	C2
Persistent pelagic habitats	Persistent upwelling area on south side of islands*	lse_pphsouth_poly	Kahn 2008	C4
	Persistent upwelling area on the north side of islands*	lse_pphnorth_poly	Kahn 2008	C4
<b>Shallow coastal species</b>				
Distribution	Dugong	lse_dugong_poly	Kahn 2008	B7
	Mola	mola_bli_molamola_poly	Kahn 2008	
	Manta Ray	bli_manta_poly	Kahn 2008	
	Blue whale distribution*	lse_cetaceanblue_poly	Kahn 2008	C5
	Byrdes whale distribution*	lse_cetaceanbryde_poly	Kahn 2008	C5
	Humpback whale distribution*	lse_cetaceanhumpback_poly	Kahn 2008	C5
	Sperm whale distribution*	lse_cetaceansperm_poly	Kahn 2008	C5
	Area of high diversity cetacean distribution*	lse_cetaceanhighdiversity_poly	Kahn 2008	C5
	Dolphin distribution	bli_dolphin_poly	Expert mapping	B8
	Shark distribution (West Nusa Tenggara)	ntb_shark_poly	Expert mapping	
	Whale distribution (West Nusa Tenggara)	ntb_whale_poly	Expert mapping	
	Endangered species (Bali)	bli_endangeredspecies_point	Expert mapping	B9
	Endangered species (West Nusa Tenggara)	ntb_endangeredspecies_point	Expert mapping	B9
Feeding and nesting areas	Turtle nesting sites	lse_turtlenesting_poly	WWF database, expert mapping	B10
	Important areas for turtles	lse_turtleimportantarea_poly	Salm 1980	B11
	Feeding areas for turtles	lse_turtlefeeding_poly	WWF database	B11
	Seabird nesting distribution (West Nusa Tenggara)	ntb_seabirds_poly	Expert mapping	B8
Spawning sites	Spawning sites for fish and shrimp	ntb_spags_poly	Kahn 2008	
<b>Other features</b>				
	Dive sites	lse_divesites_point	Internet searches	B12
	Waters in front of terrestrial reserves	Used buffer from terrestrial reserve boundaries		
<b>Socio-economic</b>				

Fishing and aquaculture	Fishing villages (Bali)	Bli_fishingvillages_poly	Department of Fisheries (Bali Province)	
	Fishing villages (West Nusa Tenggara)	Ntb_fishermenvillage_point	Field survey 2008	
	Shrimp ponds (Bali)	bli_shrimppond_poly	Field survey, government reports	
	Shrimp ponds (West Nusa Tenggara)	ntb_shrimppond_poly	West Nusa Tenggara spatial plan (2006-2020)	
	Milk fish pond (West Nusa Tenggara)	ntb_milkfish_pond	Expert mapping	
	Seaweed farming (West Nusa Tenggara)	bli_seaweed_poly	Provincial and district government reports	
Destructive fishing	Areas of bomb fishing (West Nusa Tenggara)	ntb_destructivefishing_poly	Expert mapping	
	Areas of bomb fishing (East Nusa Tenggara)	ntt_destructivefishing_poly	Expert mapping	
Coastal development	District populations	Indonesia_village	National government statistics	
Tourism	Dolphin watching areas (Bali)	bli_dolphinwatching_poly	MMAF Bali	
	Areas where marine sports activities occur (Bali)	bli_marine_sport	Field survey 2008	
	Surfing areas (Bali)	bli_surfing_poly	Expert mapping	
	Coastal tourism area (West Nusa Tenggara)	ntb_marinetourism_poly	Expert mapping	
	Coastal tourism area (East Nusa Tenggara)	ntt_marinetourism_poly	Expert mapping	
Shipping	Ports, harbours and fish landing stations	ls_porttpippiharbour_point	Survey 2008, Provincial govt reports	
	Shipping lanes (Bali)	bli_shippinglanes_line	Department of Spatial Planning	
Mining	Areas of mining in coastal areas (West Nusa Tenggara)	ntb_mining_poly	Expert mapping	
<b>Deep sea yet nearshore habitats and species</b>				
Deep sea habitats	Straits outline*	lse_strait_poly	Kahn 2008	C1
	Satellite islands*	lse_satelliteislands_poly	Kahn 2008	C2
	Oceanic islands	lse_oceanicislands_poly	Kahn 2008	C2
	Oceanic atolls	lse_atolsoceanicreefs_poly	Kahn 2008	C2
	Seamount locations	lse_seamounts_poly	Kahn 2008	C3
	Underwater canyons	lse_canyon_poly	Kahn 2008	C3
	Underwater sills	lse_sills_poly	Kahn 2008	C3

Oceanography	Persistent upwelling area on south side of islands*	lse_pphsouth_poly	Kahn 2008	C4
	Persistent upwelling area on the north side of islands*	lse_pphnorth_poly	Kahn 2008	C4
	Indonesian throughflow	Lse_indonesia_inflow	Kahn 2008	
Species	Dugong	lse_dugong_poly	Kahn 2008	B7
	Mola	mola bli_molamola_poly	Kahn 2008	
	Manta Ray	bli_manta_poly	Kahn 2008	
	Blue whale distribution*	lse_cetaceanblue_poly	Kahn 2008	C5
	Byrdes whale distribution*	lse_cetaceanbryde_poly	Kahn 2008	C5
	Humpback whale distribution*	lse_cetaceanhumpback_poly	Kahn 2008	C5
	Sperm whale distribution*	lse_cetaceansperm_poly	Kahn 2008	C5
	Area of high diversity cetacean distribution*	lse_cetaceanhighdiversity_poly	Kahn 2008	C5

## ANNEX 4.2 MARINE DATASETS FROM THE NOAA-CREP MARINE ECOSYSTEM PROGRAM

**Table A4.2.1.** A list of the NOAA-CREP datasets available in the data structure and the Timor-Leste project portal (PISC 2017). The folders are listed by chapter sequence from the report rather than in alphabetical order as found in the data structure. \*The raw and georeferenced satellite imagery is not available on the Timor-Leste Project Portal because the DigitalGlobe license agreement prohibits public distribution of the source imagery (i.e., posting the imagery online is not allowed).

Folder name and hierarchy	Folder description
<b>\Satellite Mapping\</b>	Contains the satellite mapping datasets described in Chapter 2.
\Image Catalog\	Inventory of WorldView-2 satellite images purchased, as well as the image footprints and boundaries, and the regions of interest used to define the geographic areas to acquire the satellite images (Figure 3). Format: .GDB and .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46151">https://inport.nmfs.noaa.gov/inport/item/46151</a>
\Ground Truth\	Ground-truth data collected by NOAA-CREP used to validate the depths derived from the WorldView-2 imagery (Figure 4). Format: .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/25307">https://inport.nmfs.noaa.gov/inport/item/25307</a>
\Raw Imagery\*	Raw WorldView-2 satellite imagery provided by DigitalGlobe, including the supporting metadata files (Appendix B). Format: .TIF
\Georeferenced Imagery\*	WorldView-2 satellite imagery that was georeferenced to the ESRI basemap (Appendix B). Format: .TIF
\Bathymetry\	Bathymetry data derived from the WorldView-2 satellite imagery (Figure 5). Format: .TIF Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46150">https://inport.nmfs.noaa.gov/inport/item/46150</a>
\Benthic Habitat\	Benthic habitat data derived from the WorldView-2 satellite imagery (Figure 6). Format: .TIF Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/29128">https://inport.nmfs.noaa.gov/inport/item/29128</a>
<b>\Ecosystem Assessments\</b>	Contains the datasets from the coral reef ecosystem assessment surveys in 2013 described in Chapter 3.
\Fish Surveys\	Reef fish survey data (Figure 8). Format: .CSV and .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/32998">https://inport.nmfs.noaa.gov/inport/item/32998</a>
\Benthic Images\	Benthic photographs collected during the fish surveys. Format: .JPG Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46160">https://inport.nmfs.noaa.gov/inport/item/46160</a>
\Benthic Cover\	Benthic cover data derived from the analysis of the benthic images collected during the fish surveys (Figure 16). Format: .CSV and .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46161">https://inport.nmfs.noaa.gov/inport/item/46161</a>
<b>\Climate Change Baselines\</b>	Contains the baseline datasets collected from the Climate Monitoring sites from 2012 to 2014 described in Chapter 4.
\Temperature\	Temperature data from STRs (Figure 27). Format: .CSV and .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46164">https://inport.nmfs.noaa.gov/inport/item/46164</a>
\Seawater Chemistry\	Seawater chemistry data from seawater samples (Figure 28). Format: .CSV and .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46163">https://inport.nmfs.noaa.gov/inport/item/46163</a>
\Calcification Rates\	Calcification rate data from the CAUs (Figure 31). Format: .CSV and .SHP

	Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46162">https://inport.nmfs.noaa.gov/inport/item/46162</a>
\Biodiversity\	Marine invertebrate specimen and sequenced data, and species and plate photographs from the ARMS (Figure 38). Format: .CSV, .SHP, .FASTQ, and .JPG Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46159">https://inport.nmfs.noaa.gov/inport/item/46159</a>
\Benthic Images\	Benthic photographs collected from the Climate Monitoring sites in 2012 and 2014 (see benthic photograph collages in Appendix E). Format: .JPG and .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46160">https://inport.nmfs.noaa.gov/inport/item/46160</a>
\Benthic Cover\	Benthic cover data derived from the analysis of the benthic images collected at the Climate Monitoring sites in 2014 (Figure 43). Format: .CSV and .SHP Metadata: <a href="https://inport.nmfs.noaa.gov/inport/item/46161">https://inport.nmfs.noaa.gov/inport/item/46161</a>



## ANNEX 4.3 POTENTIAL MARINE DATASETS TO INFORM CONSERVATION AND PLANNING IN TIMOR-LESTE

**Table A4.3.1.** Summary of existing (and potential) national-scale, coastal and marine spatial datasets in Timor-Leste, relevant to HCV and ecosystem-management.

Data	Source	Scale	Date Acquired	Publication
Bathymetry	NOAA-CREP – bathymetry derived from WorldView2	National	2010-14	NOAA-PISC (2017)
	GEBCO bathymetric data - 5 broad marine depth classes	Global		Grantham et al. (2011)
Coastline	ALGIS	National		
Rivers	ALGIS	National		Grantham et al. (2011)
Estuaries	The Nature Conservancy	Regional		Grantham et al. (2011)
Land types	ALGIS (Geoformations), UNDP SLM project (landcover)	National		Grantham et al. (2011)
<b>Habitat Mapping</b>				
Benthic Habitats	NOAA-CREP – using WorldView2 imagery, includes substrates by depth (shallow, mid and deep) and 8 habitat classes: soft (sand or mud), hard (rubble, boulders, etc.), seagrass, mangrove, macroalgae-dominated areas; intertidal zones; lagoons; and emergent rocks.	National	2010-14	NOAA-PISC (2017)
Seascapes	Seascapes of the Lesser Sunda Ecoregion, including 7 ‘seascapes’ (expert-based)	Regional	2008	DeVantier et al. (2008)
Coral Reefscapes	Seascapes of the Lesser Sunda Ecoregion, including 24 ‘coral reefscapes’ (expert-based)	Regional	2008	DeVantier et al. (2008)
Coral Reefs	Millennium Ecosystem Mapping Project (Landstat derived) – 7 coral reef categories, based on geomorphology ( <a href="http://imars.marine.usf.edu/MC/index.html">http://imars.marine.usf.edu/MC/index.html</a> )	Global		Grantham et al. (2011)
	Charles Darwin University, Northern Territory Government (Landstat 5TM)	National	2004-8	Boggs et al. (2009), Lieper et al. (2011).
	NOAA-CREP (WorldView2)	National	2010-14	NOAA-PISC (2017)
Mangroves	The Nature Conservancy	Regional		Grantham et al. (2011)
	Charles Darwin University, Northern Territory Government (Landstat 5TM)	National	2004-8	Boggs et al. (2009), Lieper et al. (2011).
	NOAA-CREP (WorldView2)	National	2010-14	NOAA-PISC (2017)
Seagrasses	The Nature Conservancy	Regional		Grantham et al. (2011)
	Charles Darwin University, Northern Territory Government	Landstat 5TM	2004-8	Boggs et al. (2009), Lieper et al. (2011).
	NOAA-CREP (WorldView2)	National	2010-14	NOAA-PISC (2017)
<b>Areas of Conservation Value</b>				
Existing & Proposed MPAs/LMMAs	Ministry of Agriculture & Fisheries (MAF), TL CTI NCC	National	present	MAF-Fisheries
Existing/Proposed MPAs/AOIs	Lesser Sunda Ecoregion MPA Network (The Nature Conservancy)	Regional	2011	Wilson et al. (2011)
Key Biodiversity Areas (KBAs)	Critical Ecosystem Partnership Fund (CEPF) –KBAs identified as part of Ecosystem Profile of the Wallacea Biodiversity Hotspot	Regional	2014	Burung Indonesia (CEPF 2014)

Customary Protection	areas with 'tara bandu' regulations	National		MAF
	areas with local suco regulations	National		MAF
Important Bird Areas (IBAs)	BirdLife International	Global		BirdLife International Data Zone
Endemic Bird Areas (EBAs)	BirdLife International	Global		BirdLife International Data Zone
Important wetlands for birds	Colin Trainor (Charles Darwin University) – 24 wetland sites of national importance in Timor-Leste (expert-based)	National		Trainor et al. (2007), NBSAP (2012)
Biological surveys of protected areas	Fernando Santana (DPANP)	National		Grantham et al. (2011)
Records of birds of conservation concern	Colin Trainor (Charles Darwin University)	National		Grantham et al. (2011)
<b>Community Monitoring Datasets</b>				
Seagrasses	'SeagrassWatch' data – Beloi, Com	Sub-national		BV,
Mangroves	'MangroveWatch' data -	Sub-national		BV, UNDP, KFF,
Coral Reefs	'Reef Check' data –Atauro, Com	Sub-national		BV, Shane Penny (NT Government)
Dugongs	Dugong sightings - CMS Dugong & Seagrass Project (Beloi, Com)	Sub-national	2017-present	CI-Timor Leste
Cetaceans	Whales & Dolphins of Timor-Leste (CDU-UNTL-MTAC)	National	2014-present	Karen Edyvane (CDU-UNTL)
<b>Ecosystem Assessments</b>				
Reef Fish Surveys	NOAA-CREP – north coast (150 sites)	Sub-national	2013	PISC (2017)
Benthic Images	NOAA-CREP – north coast (139 sites)	Sub-national	2013	PISC (2017)
Benthic Cover	NOAA-CREP – north coast (139 sites)	Sub-national	2013	PISC (2017)
Climate Monitoring	NOAA-CREP climate monitoring (10 sites)- temperature, seawater chemistry calcification rates, invertebrate biodiversity (ARMS data), benthic images		2012-2014	PISC (2017)
Coastal Vulnerability	National hazard assessment and mapping (UNDP-NDMD-ADCP) – flood risk, landslide susceptibility, coastal erosion, strong wind, drought risk, earthquake, tsunami risk	National	2010-2012	UNDP-NDMD, UNDP (2010), ADCP (2012)
	Coastal Vulnerability Assessment (UNDP)	National	2017	UNDP (2017)
<b>Marine Species</b>				
Seagrasses	Species distribution data – from benthic surveys (north coast)	Sub-national	2008-2013	Ayling et al (2009), CI MRAP (2012), PISC (2017)
Mangroves	Species distribution data – from benthic surveys (north coast)	Sub-national	2008-2013	Ayling et al (2009), CI MRAP (2012), PISC (2017)
Coral Reefs	Species distribution data – from benthic surveys (north coast)	Sub-national	2008-2013	Ayling et al (2009), CI MRAP (2012), PISC (2017)
Marine Megafauna	CDU-AIMS – marine megafauna aerial surveys- cetaceans, sea turtles, dugongs, sharks, rays	National	2008	Dethmers et al. (2009)
	CDU-UNTL-MTAC – marine megafauna aerial surveys- cetaceans, turtles, dugongs, sharks, rays	National	2014-present	Karen Edyvane (CDU-UNTL)
Marine Turtles	Kiki Dethmers (CDU-AIMS) – nesting sites, potential feeding areas	National	2008-present	Kiki Dethmers (CDU-AIMS)
	Whales & Dolphins of Timor-Leste (CDU-UNTL-MTAC)	National	2014-present	Karen Edyvane (CDU-UNTL)
Fish Species (distribution)	WorldFish – reef fish surveys (Atauro Island, Vemasse, Viqueque)	Sub-national	2017	

	NOAA-CRED – reef fish surveys (north coast)	Sub-national	2013	PISC (2017)
	CI-MRAP – reef fish surveys (NKS Park, Atauro Island)	Sub-national	2012, 2016	CI MRAP (2013)
	Australian Museum (north coast) – Barry Russell (NT Museum)	Sub-national	2012	Australian Museum
	CDU-NTG – reef fish surveys (north coast)	Sub-national	2008	Ayling et al. (2009)
<i>Crateroscephalus Laisapi</i> (fish)	Helen K. Larson (NT Museum)	National		Grantham et al. (2011)
<b>Socio-Economic, Cultural</b>				
Aquaculture	MAF-Fisheries – sites of pond aquaculture, fish cages, FADs	National		MAF-Fisheries
Fisheries	‘The National Fisheries Statistics System of Timor-Leste’ - Peskador (FAO-funded) - <a href="http://peskador.org/">http://peskador.org/</a> – data on fishing grounds, dangerous areas and fishers’ movements, accidents at sea or in coastal areas	National		MAF-Fisheries, FAO RFLP program.
	WorldFish – data on boats, FADS, fisheries catches, fisheries production,	Sub-national		Mills et al. (2011), WorldFish, MAF
Customary Protection	areas with ‘tara bandu’ regulations	National		MAF
	areas with local suco regulations	National		MAF
Households	ALGIS – coastal households	National		Grantham et al. (2011)

# ANNEX 4.4 NATIONAL BIODIVERSITY CLEARING HOUSE FOR TIMOR-LESTE

## Establishment and Maintenance of a Biodiversity Clearing House Mechanism (CHM) for Timor Leste (from NBSAP 2011)

The Tenth Conference of the Parties (COP10) Decision X/15 (UNEP/CBD/ COP/10/15) identified national Biodiversity CHM's as means not only to promote scientific and technical cooperation among parties to the Convention, but most importantly, to provide information services to facilitate the implementation of National Biodiversity Strategic Action Plans (NBSAPs). Working along this framework, the establishment of a national Biodiversity CHM for Timor-Leste aims to:

- Facilitate technical and scientific cooperation and coordination on biodiversity conservation activities among concerned units including local government and non-government organizations, academic and research institutions;
- Promote exchange, integration and use of biodiversity information as a tool for informed decision making through the national CHM website;
- Promote the use of the national CHM website as a tool to monitor the progress of Timor-Leste's NBSAP; and
- Increase awareness of the communities and the general public on Timor-Leste's biodiversity conservation measures through the national CHM website.

The NBSAP (2011, pp 42 – 50) provides specific guidance on the Biodiversity CHM for Timor-Leste, including an agreed approach to monitoring biodiversity in Timor-Leste.

**Figure A4.4.1.** Proposed Biodiversity CHM website, content and structure (from NBSAP 2011).



Figure 2. Proposed National CHM Website Design for Timor-Leste

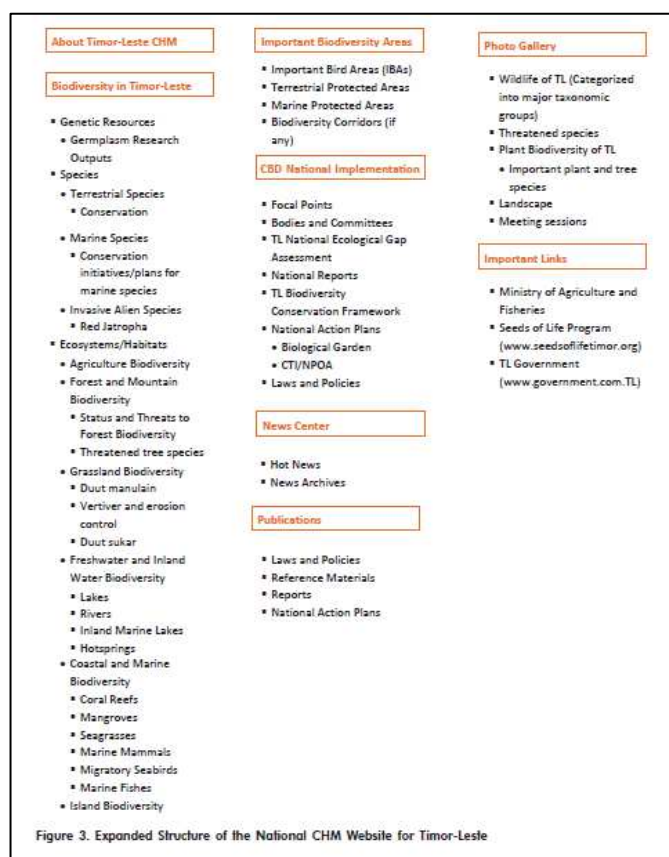



Figure 3. Expanded Structure of the National CHM Website for Timor-Leste



## ANNEX 4.5 CORAL TRIANGLE ATLAS


<http://ctatlas.reefbase.org>

Photo credit: Emre Turak



**CORAL TRIANGLE  
ATLAS**

[ctatlas.reefbase.org](http://ctatlas.reefbase.org)



### What is the Coral Triangle?

The Coral Triangle is globally recognized as the epicenter of marine biodiversity, home to an incredible 76 percent of the world's coral species and 37 percent of the world's reef fish species. The area stretches over thousands of kilometers and links six countries: Indonesia, the Philippines, Malaysia, Timor-Leste, Papua New Guinea and the Solomon Islands. However this incredible area is under increasing pressure from a range of serious threats: growing coastal populations, rising sea surface temperatures, sea level rise and increasing levels of acidity. The Coral Triangle's resources are being fast depleted and in some cases, irreparably damaged. Leaders from the six Coral Triangle countries are working together to address this challenge by forming a unique regional initiative known as the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI). The powerful commitments coming out of the CTI will form the basis of unprecedented efforts to protect this area of exceptional biodiversity and protect the livelihoods of over 126 million people, and the food needs of millions more.

### What is the Coral Triangle Atlas?

The Coral Triangle Atlas is an online Geographical Information System (GIS) database, providing scientists and NGOs with a view of spatial data at the regional scale. Biophysical and socioeconomic information has been collected for decades by scientists and managers for different parts of the Coral Triangle. However, to date, little of this information has been centralized to form region wide layers that provide an overall view and enable management plans at a regional level.

### How will the Coral Triangle Atlas help?



This project will improve the efficiency of conservation planning in the region by giving researchers and managers access to spatial information while encouraging them to share their data to complete the gaps, therefore reducing duplicate data collection efforts and providing the most complete and most current data available. The CT Atlas will be particularly useful in the design and planning of MPAs and MPA Networks throughout the region.


### How can you contribute to the Coral Triangle Atlas?

The CT Atlas welcomes organizations desiring to share their data. By contributing to the CT Atlas, NGO partners, governments and managers are helping to strengthen the effectiveness of conservation activities in the Coral Triangle through improved information flow. With access to the region's best datasets, scientists and managers will have the tools necessary to conduct complex analyses and measure the results of conservation activities designed to ensure the sustainability of the Coral Triangle's spectacular marine resources and the millions of people who depend on them.




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**Partners**

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## ANNEX 4.6 PESKADOR

**Peskador - National Fisheries Statistics System of Timor-Leste (FAO - MAF)** - <http://peskador.org/>

Peskador provides public access to a wide range of statistical and environmental information relating to fisheries in Timor-Leste. The site is operated by the National Directorate of Fisheries and Aquaculture (NDFA) and was established with the support of the Spanish-funded [Regional Fisheries Livelihoods Programme for South and Southeast Asia \(RFLP\)](#) which is implemented by the [Food and Agriculture Organization of the United Nations \(FAO\)](#).

Publicly available information includes:

- Boat census data gathered by the Fishery Inspection Department
- Daily information on the price of fish by species and location
- Live maps showing fishing grounds, dangerous areas and fishers' movements
- Data on accidents at sea or in coastal areas

A restricted area of the site includes:

- Live maps and data recording incidents of reported illegal fishing
- Complete data sets of information gathered

The site is also home to public information on other fisheries-related projects and fisheries legislation as well as a portal for data provided from other providers such as weather, tide, wind predictions, cyclone warnings and sea surface temperatures.

### ANNEX 9 MAPS (from RFLP Terminal Report 2013)

1. Tara Bandu Live map [www.peskador.org](http://www.peskador.org) (under publication)
2. Bathymetric map of Beacou (fishing pattern) Live map [www.peskador.org](http://www.peskador.org) (under publication)
3. NDFA boat registration Live map [www.peskador.org](http://www.peskador.org) (under publication)
4. Aquaculture Live map [www.peskador.org](http://www.peskador.org) (under publication)
5. Dangerous places Live map [www.peskador.org](http://www.peskador.org) (under publication)
6. Seaweed Atauro Live map [www.peskador.org](http://www.peskador.org) (under publication)
7. Community maps Live map [www.peskador.org](http://www.peskador.org) (under publication)
8. Bathymetric map of Atauro

3 – D map Unpublished (see next page)

## ANNEX 4.7 MARINE-HCV ACTIVITIES PROPOSED UNDER THE ATSEA2 PROGRAM

**Table A4.7.1.** Marine GIS, inventory and mapping activities proposed for Timor-Leste under the ATSEA2 Program (from ProDoc).

<b>OUTCOME 2.3: COASTAL AND MARINE BIODIVERSITY CONSERVED THROUGH PROTECTION OF HABITATS AND SPECIES</b>	
<b>Output 2.3.1 Updated information and database on coral, mangrove and seagrass beds in the ATS, supported by ecosystem valuation studies; priority conservation areas identified in Indonesia and Timor-Leste</b>	
<b>Regional Activities under Output 2.3.1</b>	
2.3.1-1.	Prepare a detailed work plan for the activities under this output, through consultations with relevant regional and national ATS stakeholders, including members of the SPF and other existing expert and policy related forums.
2.3.1-2.	After objectives are agreed upon in the work plan developed under Activity 2.3.1-1, a desktop review and gap analysis will be carried out to collate existing knowledge and understanding of baseline data, for example coral reefs, mangroves, and seagrass ecosystems, as well as climate change impacts and turtle conservation in the ATS. From this a regional profile of ecosystem assets and connectivity and an evaluation of pressures will be developed.
2.3.1-3.	Carry out ecosystem valuation at the regional and national levels.
2.3.1-4.	Support regional MPA information management in the ATS region, with respect to ecological, governance, and socio-economic issues. This could include expanding the CT Atlas to incorporate ATS information as well as strengthening the Indonesian biodiversity information system (BCH) with the information collected on critical habitats.
2.3.1-5.	Support existing programs in the mapping of critical habitats for protected species, including turtles, as well as biodiversity hotspots, building on work of REBYC II to identify priority conservation areas in the ATS through cross-sectoral stakeholder consultation, including an expert workshop.
<b>Timor-Leste:</b>	
2.3.1-7.	Building upon the results of the regional activities listed above and on those of CTI-CFF, work with relevant governmental, NGO, and institutional level stakeholders in identifying priority marine and coastal high conservation value areas.



**Table A4.7.2.** Marine Protected Area activities proposed for Timor-Leste under the ATSEA2 Program (from ProDoc).

<b>OUTCOME 2.3: COASTAL AND MARINE BIODIVERSITY CONSERVED THROUGH PROTECTION OF HABITATS AND SPECIES</b>	
<b>Output 2.3.2 New MPAs designated in Indonesia and Timor-Leste; covering about 645,000 ha in area, including approximately 220,000 ha of mangrove ecosystems; with corresponding management plans prepared and implemented; and regional ATS MPA network designed</b>	
<b>Regional Activities under Output 2.3.2</b>	
Activities under Output 2.3.2 are designed to improve the management of existing MPAs in the ATS as well as extend the coverage of important biodiversity seascapes under MPAs in Indonesia and Timor-Leste, and on a regional scale.	
Using data collected in Output 2.3.1, a regional ATS MPA network will be designed through scientific assessment and consultation, including with stakeholders from each of the four ATS littoral countries, in order to ensure relevant representation in the design of the network. The process will include setting the objectives of the network; identifying the key conservation features, threats and uses of the area; applying relevant conservation planning tools; and facilitating input from relevant government agencies, local stakeholders and scientific experts through workshops and meetings. Learning from experiences in Lesser Sunda, high resolution satellite imagery and ground-truth activities could be used to refine the analysis in designing the MPA network. The MPA Network design will also factor in the activities in output 2.3.3 to ensure cross benefit for improving conservation and management of important habitats for marine turtles.	
<b><u>Timor-Leste:</u></b>	
National activities in Timor-Leste will focus on extending the MPA Network for the Lesser Sunda Seascope to include an approximate 90,000 ha new MPA in Betano to Clacuc (Klakuk) in Município Manufahi, extending along 40 km coastline and out to 12 nautical miles.	
<b>Regional Activities Under Output 2.3.2:</b>	
2.3.2-2.	Set goals and objectives, and design an ATS regional MPA network.
2.3.2-3.	Following stakeholder consultations facilitate endorsement of the MPA network design by the ATS Regional Coordination Committee of the design.
2.3.2-4.	Incorporate a “road map” for achieving the proposed ATS regional MPA network into an updated ATS SAP, which will obtain approval through ministerial declaration under Component I of this project.
<b><u>Timor-Leste: Betano to Clacuc (Klakuk) MPA; Design and Support Designation</u></b>	
2.3.2-19.	Carry out a scoping study for the proposed new MPA; the scoping study will identify recommended boundaries and conservation objectives and include gap analysis of baseline biophysical and socio-economic data and mapping. It is to be undertaken in consultation with the community and industry stakeholders.
2.3.2-20.	Compile the gathered information and prepare the required documentation for applying for designation (IUCN category) and establishing the legal framework for the proposed MPA.
2.3.2-21.	Support capacity building for marine protected area management staff as well as officials from the adjoining municipalities in MPA planning and management.
2.3.2-22.	Facilitate validation and endorsement of a draft management plan for the proposed MPA, and including extensive stakeholder consultation.



2.3.2-23.	Develop a financial sustainability plan for the proposed MPA, based upon in-depth stakeholder consultations and a review of alternative financing options exploring use of Payments for Ecosystem Services (PES), community tourism models, and other mechanisms.
2.3.2-24.	Organize a donor workshop, possibly in conjunction with the annual RCC/SPF meeting, with the purpose of securing financing from private sector, the donor community, or other interested stakeholders.
<b>Timor-Leste: Nino Konis Santana MPA; Strengthening Financial Sustainability</b>	
2.3.2-25.	Support the MAF in updating and strengthening the management plan for the NKS MPA, with the aim of improving management effectiveness.
2.3.2-26.	Develop an updated financial sustainability plan for the NKS MPA, based upon in-depth stakeholder consultations and a review of alternative financing options exploring use of Payments for Ecosystem Services (PES), community tourism models, and other mechanisms.
2.3.2-27.	Organize a donor workshop, possibly in conjunction with the annual RCC/SPF meeting, with the purpose of securing financing from private sector, the donor community, or other interested stakeholders.
2.3.2-28.	<u>Locally Managed Marine Area.</u> Support implementation of the financial sustainability and updated management plans, with the focus on participatory integrated approaches engaging local communities. Potential implementation activity include building the capacity of local communities to strengthen existing LMMAs, e.g., seagrass, dugong and turtle monitoring programmes, ecotourism ventures, or mangrove watch, etc.

**Table A4.7.3.** Marine megafauna activities proposed for Timor-Leste under the ATSEA2 Program (from ProDoc).

<b>OUTCOME 2.3: COASTAL AND MARINE BIODIVERSITY CONSERVED THROUGH PROTECTION OF HABITATS AND SPECIES</b>	
<b>Output 2.3.3 Endangered marine turtles protected through an agreed regional action plan</b>	
2.3.3-2.	Develop a regional ATS action plan for enhanced protection of marine turtles.
2.3.3-4.	Cross Project exchange visits – within and between countries. Exchange visits with other projects and programs addressing fisheries impacts on seagrass habitats or marine megafauna (by-catch, direct take, etc.); seagrass research and monitoring, eco-tourism etc.
2.3.3-8.	Establish a pilot project to improve community-based turtle conservation and ecotourism opportunities established in Com, NKS National Park, working with existing women's groups. This would include a feasibility study as an initial step and will focus on addressing reducing direct illegal harvesting of turtles and dugongs through capacity and awareness building with local communities in NKS using Com as a case study.
2.3.3-9.	Reduce the by-catch of turtles by working with the fishing industry. Activities will include support for trials of by-catch reduction devices, capacity and awareness building with fishers and improving regulations and compliance.
2.3.3-10.	Support the development and implementation of a crocodile management plan for Timor-Leste, focused on addressing the threats to community posed by crocodiles, particularly on the south coast and raising awareness with local communities.

# ANNEX A1. SCOPE OF WORKS

## I. PROJECT DESCRIPTION

The vision behind USAID's investment in the tourism sector through USAID's Tourism for All Project (Tetun: USAID nia Projetu Turizmu Ba Ema Hotu) is to promote Timor-Leste's competitiveness as an international tourism destination while preserving its unique environmental and cultural heritage. The purpose of this activity is to expand and improve Timor-Leste's tourism offerings using an inclusive and sustainable approach. The aim is to facilitate private investment by working with government to establish incentives and obligations that are more private sector-friendly, promote steady and sustainable tourism growth, and safeguard the environment and social characteristics of local communities. The Timor-Leste Strategic Development Plan 2011-2030 identifies five different tourism niches including: eco and marine, historical and cultural, adventure and sports, religious and pilgrimage, and conference and convention. While there are a variety of ways to characterize these niches, the project will focus on niches and products to augment receipts to the local economy.

The project is expected to learn from and adapt to changing circumstances throughout implementation, including market forces, which can result in shifts in selected niches or products when warranted. It will be important to consider both private sector investment on private land and also how to create favorable conditions for private sector investment in and management of public assets such as protected natural or cultural sites. The project must implement solutions that achieve the outlined objectives and contributes to measurable improvements in receipts derived from the tourism sector in Timor-Leste.

## 2. PURPOSE OF THE ASSIGNMENT

An updated inventory is needed of key marine resources to determine which should be placed under protected status. While some work has already been done on this, it has not been shared openly. As of July 2017, the World Database on Protected Areas lists Timor-Leste as having 46 protected areas, including 15 wild protected areas of which only three are marine protected areas. In many cases, however, there are no management plans in place and no legal monitoring or enforcement to ensure they are protected. For the protected areas having conservation impact, their coverage adequacy needs to be assessed and management plans need to be in place. During the project's first year, we will work with the Ministry of Agriculture and Fisheries (MAF) and other GoTL agencies to update and enhance the inventory of key biological and ecological resources. The project will apply the high conservation value approach to map out those areas. This approach can inform conservation strategies at the national level and protected area management plans at the sub-national level and help prioritize project assistance to those protected areas with significant ecological conservation values as well as review the current status of protected areas in terms of conservation planning and management.

The Marine Conservation Specialist will work with the MAF, responsible for national parks to complete this inventory and the mapping of high conservation value areas at a national scale. The inventory is a living document that can be updated as new tourism products or sites are developed and as new areas critical for biodiversity conservation,

such as habitats of endemic and endangered species, are discovered. The project, together with MAF will develop a mechanism for regularly updating the inventory and area maps and circulate a description of this mechanism for comment from GoTL stakeholders.

### 3. PRINCIPAL TASKS AND RESPONSIBILITIES

As the Marine Conservation Specialist, Dr. Edyvane' s tasks will include, but not be limited to the following:

- Meet with the Ministry of Agriculture and Fisheries (MAF) and other GoTL agencies and stakeholders (for example Conservation International) in order to discuss assignment and collect existing marine mapping and inventory information available for Timor-Leste. During meetings information should be collected regarding current state and process for marine conservation mapping, modification and inventory process.
- Conduct review of all documentation and ensure most recent map/inventory comprehensively considers other versions. If modifications to incorporate multiple versions are needed make modifications in order to create an updated comprehensive Marine conservation mapping document.
- Following meetings with GoTL and stakeholder organizations conduct evaluation on if current mapping and inventory process is in line with Marine Conservation best practices. Conduct analysis identifying if all parties involved in Marine conservation are able to effectively share information and make updates. If deficiencies are found provide suggestions for improvement.
- Following a review of finding with project team and COP, meet with GoTL and stakeholder organizations to present findings regarding Marine Conservation Map and inventory assessment and suggested next steps/ areas for improvement.

### 4. DELIVERABLES

Detailed report including the following sections:

- Current state of marine high value conservation management. GoTL and stakeholder engagement, coordination and management.
- Review and analyses of present, publicly shared key marine high conservation map and inventory.
  - Identified discrepancies in mapping information and suggested next steps.
- Review and analysis of present inventory mapping modification process.
  - Current state, next steps and suggestions in line with international conservation best practices.
  - Present detailed mechanism for regularly updating the inventory and area maps – taking into account input and guidance from MAF, ALGIS and key stakeholders, as appropriate.
- Provide section outlining next steps in supporting GoTL and stakeholders in marine conservation management including specific tools, resources, and trainings.
- As an annex of the report a completed inventory of key Marine Conservation areas, and list of relevant coastal-marine datasets, and relevant programs, reports and plans and mapping of high conservation value areas at a national scale – highlight areas where information is missing, inventory update is needed.
- Out briefing presentation with USAID (and other stakeholders as deemed appropriate by USAID) outlining finding form report.