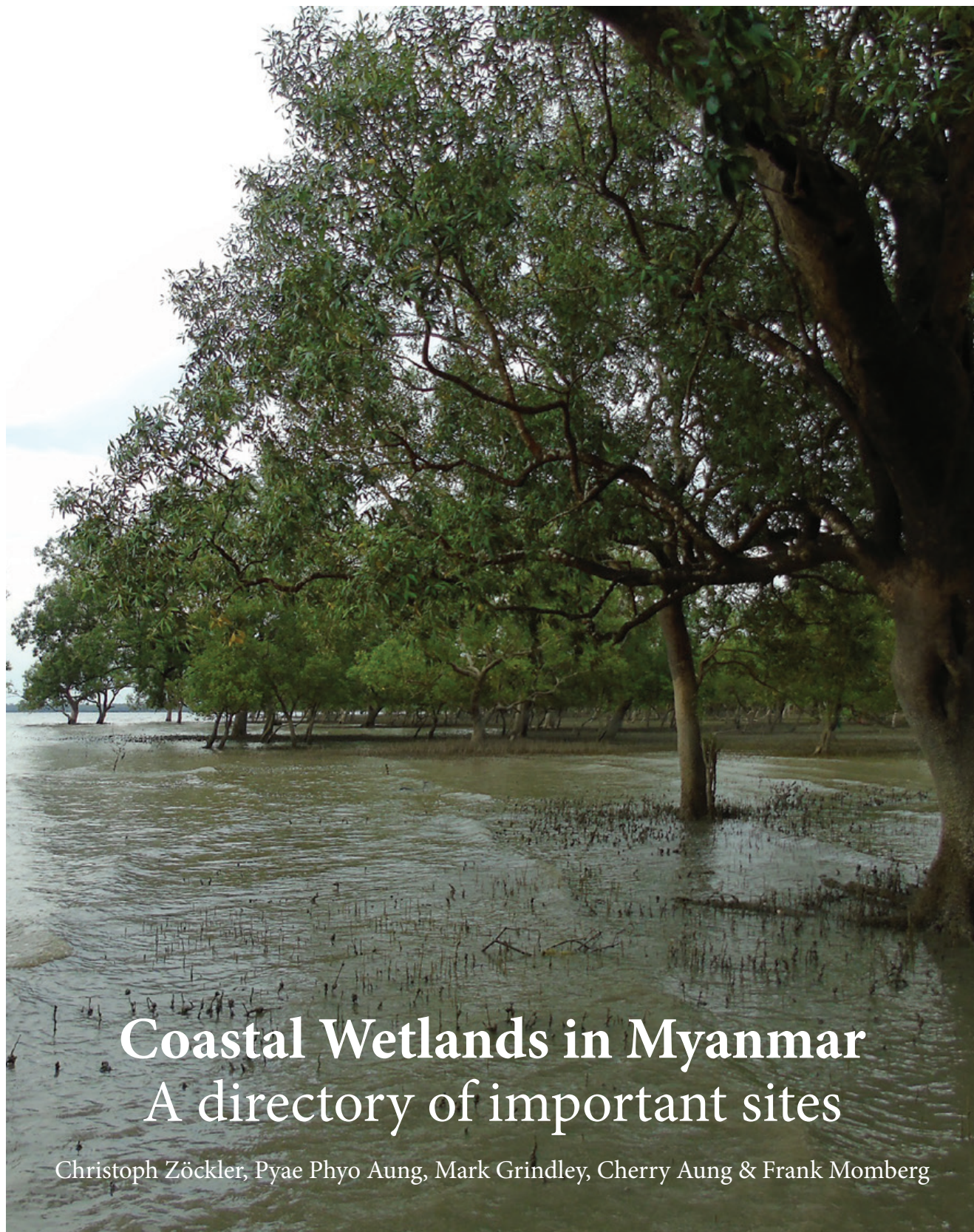




Coastal Wetlands in Myanmar

A directory of important sites

Christoph Zöckler, Pyae Phyo Aung, Mark Grindley, Cherry Aung & Frank Momberg





Funded by the Lighthouse Foundation, Hamburg, Germany
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Recommended citation: Zöckler, C. Aung, P.P., Grindley M., Aung Ch. & Momberg, F. 2018. Coastal Wetlands in Myanmar – a directory of important sites for biodiversity. ArcCona Ecological Consultants, Cambridge, UK.

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1 Southern Myeik Archipelago	Mudflats & Mangroves CBR	186,000 ha
2 Northern Myeik Archipelago	Biosphere Reserve	54,000 ha
3 Mali and Thayaw Thadangyi Islands Group	MPA	113,000 ha
4 Langann Islands Group	MPA	21,627 ha
5 Moscos Island extension	MPA	93,631 ha
6 Dawei River Estuary	WS	25,000 ha
7 Hain-Ze Bay mudflats and mangroves (south of Ye but in Tanintharyi)	WS	27,000 ha
8 Southern Bilugyun and Kjaikkami	Biosphere Reserve	88,000 ha
9 Gulf of Mottama	Ramsar site and Biosphere Reserve	320,000 ha
10 Meinmahla Kyun and outer Delta Islands	Ramsar site and M&B	73,000 ha
11 Khaing Thaung Island	CBR	1,538 ha
12 Western Delta Islands and Coast	Ramsar site and M&B	1,500 ha
13 Thameehla Island	WS	88 ha
14 Nga Yoke Kaung	CBR	3,343 ha
15 Pho Htaung Gyaing	CBR	4,027 ha
16 Kyeintali	WS	1,600 ha
17 Manaung and Islands south	Marine NP and mudflats	38,973 ha
18 Kyaukphyu Mangroves	WS	190,000 ha
19 Nan Thar Island and May-Yuu River mouth	WS and Ramsar site	2, 419 ha

Foreword

With the remarkable ecological diversity and species richness, Myanmar's coastal wetlands provide multiple ecosystem services such as fish breeding grounds, protection against water-related disaster risk, carbon absorption, etc. Wetlands maintain food webs for living creatures, and provide aquatic products as livelihood benefits for millions of Myanmar people. In addition, the coastal wetlands also have cultural, spiritual and/or historical values associated with people.

Nowadays, the existence of coastal wetlands is being threatened by many issues, ranging from over-exploitation of biological resources to negative impacts of climate change. Conservation, effective management and sustainable use are primary objective of preserving the biological resources in Myanmar. It is crucial to clearly understand the status and threats of the areas for sustainable management of the coastal wetlands according to these objectives.

This brief directory "Coastal Wetlands in Myanmar" is the result of collective efforts of international researchers, scientists from local university, government officers, international and local NGO staffs, and other organizations, by undertaking countless hours of surveys over the past ten years. It is a guidebook for 19 important coastal wetlands in Myanmar, providing detailed information of each site; conservation values including wetland dependent species, status of protection, protection criteria, threats and involvement of local community in conservation. In this regard, it is a welcome contribution to preparation of the National Wetland Directory.

I would say that this report provides easy access of the Country's important coastal wetland information to scholars, scientists, professionals, interested individuals, government and partner organizations to ensure the country meets its biodiversity targets. The more we know about the coastal wetlands of Myanmar, the greater the potential to conserve and manage these resources for a healthy planet and a sustainable future for humankind.

With this in mind, I would like to express my great appreciation to the ArcCona Ecological Consultants and all contributors for their diligence and dedication in producing this valuable report with outlook.

Nyi Nyi Kyaw, Ph.D
Director General
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Ministry of Natural Resources and Environmental Conservation
The Republic of the Union of Myanmar



Summary

Coastal wetlands in Myanmar provide a huge wealth of biodiversity, ranging from Dugongs and Dolphins to migratory waterbirds and marine turtle nesting and feeding sites. They have been underrepresented in conserving biodiversity and wildlife in Myanmar, but recently received much more attention. While land based areas have reached a level of 6% in protection, very few of the coastal areas (>3%) have been safeguarded for biodiversity and local people's livelihoods until very recently. In 2017 Myanmar added two more Ramsar sites from a range of coastal wetlands to the global network of internationally important wetlands. The government is also currently expanding its Marine Protected Area (MPA) network and national and international NGOs have been proposing several sites to be included. These and many other initiatives of the government of Myanmar are very welcome and in good time when coastal wetlands are facing numerous threats. It is very encouraging to see coastal wetlands recognised and becoming included into the country's protected area network. In this brief directory we aim to provide a summary and status report of the coastal wetlands in Myanmar that might guide further activities in protecting coastal wetlands.

At present a total of 19 coastal sites have been chosen as national and regionally important for consideration as wetlands of national and international importance and assessed for this report. Each site is considered in its conservation value, its protection status and threats, while its implementation and the potential form of future protection has a strong focus on local community involvement. Information from each site is varying enormously, hence some areas lack largely crucial basic data, but these sites need to be part of the overall network of coastal sites and this document might help to fill some gaps in the future. Implementing all the proposed sites would comprise an additional total of almost 1 million ha added to the existing 3,9 million ha. This would increase the total Protected Area coverage in Myanmar from 5,8% to almost 9% and for coastal sites achieve the 10% Aichi Target 11 appropriately. Almost all proposed sites will qualify also as part of the IBA and KBA site network. These new proposed areas are a minimum requirement to safeguard the rich diversity of coastal habitats and species, secure vital livelihoods of local communities and prepare the country for rapid economic development, adapt to the increasing hazards coming with global warming and create a buffer towards unsustainable development. The implementation of the protection of these network of coastal sites will also assist Myanmar in contributing to the many international obligations, like the Convention on Biological Diversity, the Ramsar Convention or the Flyway Network Sites of the East Asian Australasian Flyway Partnership. Many of the proposed sites will be co-managed with local government and communities ensuring the long-term and sustainable development for the future.



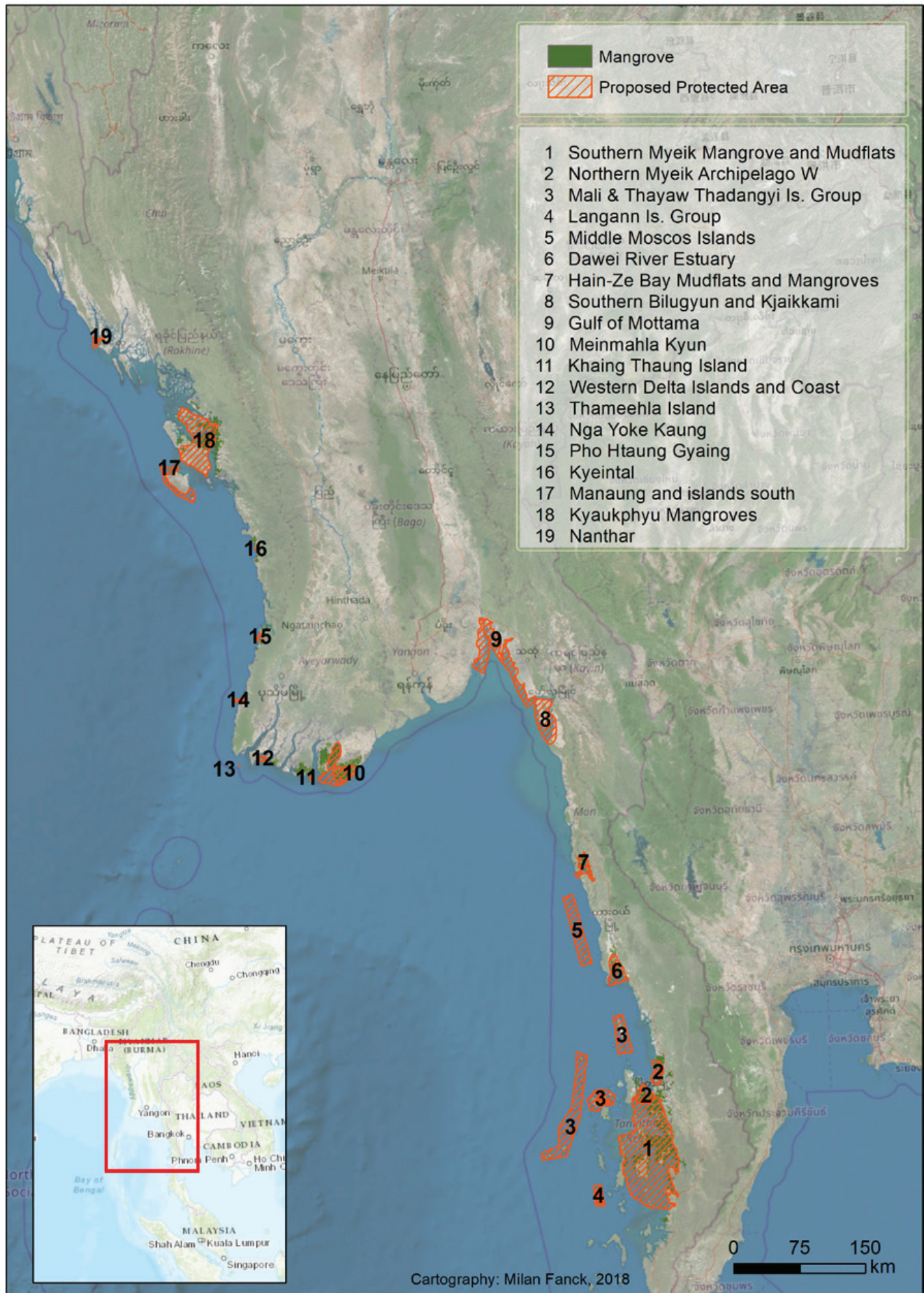
Introduction

Myanmar has already protected 6% of its land and is planning to increase this to 17%. However, marine areas have been very few until recently. In 2017 the country added two more Ramsar sites from a range of internationally important coastal wetlands into the Ramsar list of the country. Myanmar also listed three coastal sites as Flyway Network sites under the EAAFP, two of them in 2018! The government is also expanding its Marine Protected Area (MPA) network and national and international NGO have been proposing several sites to be included. These and many other initiatives of the government of Myanmar are very encouraging. In this brief overview we aim to provide a summary and status report of the coastal wetlands in Myanmar. Many national conservation NGOs are coordinating their efforts to boost the Protected Areas network and assist the Government in Myanmar. Currently, ArcCona, BANCA, and FFI, are working on a coastal wetland directory that summarises the need of the most urgent sites that require national and international protection status.

Protected Areas do not just serve biodiversity only, but cater for a wide range of services for the society and local communities. Supporting sustainable livelihoods and economic opportunities, such as eco-tourism and long term safeguards for resource management are prime objectives of the enhancing network of coastal protected areas. They assist the country in achieving the Aichi targets of the CBD, enhance the Ramsar obligations and strengthening other international commitments such as the COP21 targets of the Paris agreement. As signatory of the CBD, however, Myanmar is committed to achieve Aichi biodiversity target 11 on effective management of biodiversity and ecosystem, and to protect 17% of its terrestrial areas and 10% of coastal and marine areas. The NBSAP (GoM 2015) identifies a majority of the sites mentioned, but implementation has been slow and also coastal habitats have been until recently underrepresented. Recommendations and site suggestions from this report will help to address and meet the Aichi Targets and cover a wide range of different coastal habitats. As most coastal habitats have been largely neglected in the past there is now a strong emphasis on coastal areas. Almost all of the proposed sites are included in the CEPF hot spot areas (Tordoff *et al.* 2012) and key biodiversity areas (KBA).

At present a total of 19 coastal sites have been identified as national and regional importance for consideration as Protected Area and included in this report. Implementing all the proposed sites would comprise an additional total of almost 1 million ha added to the existing 3,9 million ha. This would increase the total Protected Area coverage in Myanmar from 5,8% to almost 9% and will achieve well over 20% over the coastal wetlands and address the Aichi Target 11 appropriately. Almost all proposed sites will qualify also as part of the IBA and KBA site network. These new proposed areas are a minimum requirement to safeguard the rich diversity of habitats and species, secure vital livelihoods of local communities and prepare the country for rapid economic development, adapt to the increasing hazards coming with global warming and create a buffer towards unsustainable development.





Overview of proposed Protected Areas

1 Southern Myeik Mangrove and Mudflats

1.1 Conservation value

This area (186,000 ha) is home to the largest connected mangrove areas in Myanmar. Most of the mangroves are still in a very good condition. In addition the area is home to vast stretches of intertidal mudflats. They are often adjacent to the mangroves and build an ecological unit. The intertidal mudflats host a large number of waterbirds, mainly waders and gulls and terns. In total an estimated 7500 waterbirds are using the mudflats and mangroves west of Kan Maw. The Southern Myeik mangroves and mudflats are crucially important for over 18,000 Larolimicolae (Waders and Gulls). Together with more than 3000 egrets and herons and waterbird numbers in previously visited mudflat areas the total number of waterbirds well exceeding the 20,000 Ramsar threshold. The birds include a total of 7 globally threatened species, one critically (CR), two endangered (EN), four vulnerable (VU) and 10 are classified as near-threatened. Six Waterbird species have been recorded in numbers of 1% or higher of the flyway population, fulfilling further criteria of the survey area for a wetland of international significance of the Ramsar Convention. Among the migratory

waterbirds migratory birds breeding in Arctic and temperate Russia and China were recorded, as well as a colour-marked Terek Sandpiper that carried the markings of an Australian ringed bird. This shows the hub for migratory birds visiting the area from as far as Arctic Russia, China, Mongolia and Australia. Six Waterbird species have been recorded in numbers of 1% or higher of the flyway population, fulfilling further criteria of the survey area for a wetland of international significance of the Ramsar Convention. Rare and semi-endemic mangrove species such as Copper-throated Sunbird were recorded in the mangroves several times again in good numbers. Two birds, the Mangrove Pitta and the Brown-winged Kingfisher have been recorded in high densities indicating a mature mangrove system. A total of 13 in two flocks of the range-restricted Plain-pouched Hornbill has been observed near Kan Maw Island and in total 7 Lesser Adjutant Stork had been added to the total of over 40, supporting the survey area as a Key Biodiversity Area (KBA). Among the few mammals observed, the Long-tailed Macaque and a couple of Humpbacked Dolphins (VU) were note-worthy.

Table 1.1: Status of globally threatened and endemic species based on multiple surveys in 2013, 2015, 2016 and 2017 (Saw Moses 2013, Zöckler 2016a, 2016b, Zöckler *et al.* 2017)

<i>Species</i>	<i>Scientific name</i>	<i>RL-Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Mammals					
Hump-backed Dolphin	<i>Susa pacifica</i>	VU	>10	A1	
Irrawaddy Dolphin	<i>Orcaella brevirostris</i>	VU	~20	A1	
Smooth-coated Otter	<i>Lutragale perspillata</i>	VU	>100	A1	
Birds					
Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR	5-10	A1	
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	40-50	A2	2.3%
Great Knot	<i>Calidris tenuirostris</i>	EN	2500	-	
Far-Eastern Curlew	<i>Numenius madagascariensis</i>	EN	1		
Lesser Adjutant	<i>Leptoptilos javanicus</i>	VU	50-75	A1	
Chinese Egret	<i>Egretta eulophotes</i>	VU	60+	A1	
Plain-pouched Hornbill	<i>Aceros subruficollis</i>	VU	300	B1	
Great Slaty Woodpecker	<i>Mulleripicus pulverlintus</i>	VU	?		

<i>Species</i>	<i>Scientific name</i>	<i>RL-Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Beach Thick Knee	<i>Esacus neglectus</i>	NT	40-50 ?		
Eurasian Curlew	<i>Numenius arquata</i>	NT	2500	A2	2.4%
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	~500		
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT	~50		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	~400		
Red-necked Stint	<i>Calidris ruficollis</i>	NT	~150		
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	18		
Grey-headed Fish Eagle	<i>Ichthyophaga ichthyaetus</i>	NT	10		
Red-breasted Parakeet	<i>Psittacula alexandri</i>	NT	>40		
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	[2400]	B1	
Chestnut-bellied Malkoha	<i>Phaenicophaeus sumatranus</i>	NT	2		
Red-throated Barbet	<i>Megalaima rafflesii</i>	NT	>10		
Mangrove Pitta	<i>Pitta megarhyncha</i>	NT	[5050]	B1	
Whimbrel	<i>Numenius phaeopus</i>		1000+		1.9%
Terek Sandpiper	<i>Xenus cinereus</i>		567		1.4%
Common Redshank	<i>Tringa totanus</i>		1784		1.8%
Brown-headed Gull	<i>Larus brunneicephalus</i>		5100		3.1%

1.2 Status of protection

There is no area officially protected or gazetted as PA, but several mangrove areas are designated as Reserve Forest Areas. The area in mind is very large (> 600,000 ha) and hence require a different protection approach. With many communities (>100 villages) included a Man & Biosphere Reserve might be appropriate form of protection. The most important sites for waterbirds within this area could be designated as a cluster of Ramsar sites.

1.3 Protection criteria (Ramsar & KBA)

A total of over 20,000 waterbirds visit regularly in winter and on migration the site. Six waterbird species visit the site with numbers beyond the 1% flyway population criterion (see Table 1.1). The high numbers of well over 10 Humpbacked Dolphins (VU) also adds to the Ramsar qualification. The area qualifies as KBA based on several trigger species. The occurrence of the range-restricted Plain-pouched Hornbill has been observed near Kan Maw Island and in total 50-75 Lesser Adjutant Stork had been recorded, supporting the survey area

as a Key Biodiversity Area (KBA). Table 1.1 shows the species and numbers in the proposed protected area that potentially qualify for the KBA criteria.

1.4 Threats

A newly developed rapid assessment tool describes most of the mangroves as affected by human activities. Cutting for firewood and charcoal production is increasing the unsustainable harvest of the mangroves and jeopardising its biodiversity and ecosystem services. However, especially the mature mangrove areas near Bokpyin were almost unaffected and in a good state, reflecting the good care of some local communities looking after their local mangrove stands in this area. These could be a good showcase of diligent care and management of mangrove areas for other communities. In the course of the survey we also established that the logging and degradation of the mangroves is a relatively new development but rapidly increasing.

1.5 Local involvement

Local communities are key to the long-term



Fig. 1.1 Proposed Biosphere Reserve in the Southern Myeik Archipelago

conservation of the area. FFI has began to work closely with local communities in Aukland Bay to raise awareness and appreciation of biodiversity and ecosystem services of the mangroves. Some local communities are already well aware of their mangrove and mudflat biodiversity assets and established 'Communities Conservation Forest' areas in close collaboration with the Forest Department. In Particular in Sakhan Thit and Bokpyin local communities are involved in self-managed conservation schemes. More detailed information is required and these areas and communities can serve as examples for the wider region.

1.6 References

Nature Conservation and National Parks Project, Burma 1983. Report on a reconnaissance of part of the Pakchan Reserved Forest and Lampi Island, Tenasserim: FO:BUR/80/006 Field Report 21/83. Rangoon: FAO.

Saw Moses 2013. Bird Survey of the Myeik archipelago. Unpubl. Report for FFI

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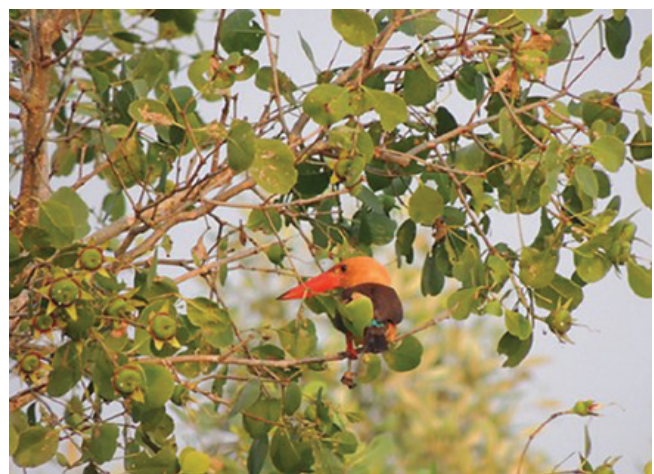
Zöckler, C., D. Li, S.U. Chowdhury, M. Iqbal & C. Yu. 2018. Winter distribution, habitat and feeding behaviour of Nordmann's Greenshank *Tringa guttifer*. Wader Study 125(1): 7–14.

Zöckler, C. & S. T. Lwin 2018. First breeding record of Beach Thick-knee *Esacus neglectus* in Myanmar. Wader Study 125(1): 45–47.

Zöckler, C. & C. Aung. (in press). The mangroves and intertidal mudflats of Myanmar. To be published in 'Sabkha Ecosystems Vol. 6: Asia Pacific'.



Rocky outcast, high tide roost for Eurasian Curlews *Numenius arquata* and other waders



Brown-winged Kingfisher *Pelargopsis amauroptera* – characteristic bird of the southern Myeik Mangroves



Sakhat Thit Monastery



High densities of mud crabs in intertidal mudflats near Kan Maw

2 Northern Myeik Archipelago

2.1 Conservation value

The Northern Myeik Archipelago is home to 210 different bird species, eight of them globally threatened and 15 near threatened. See Table 2.1 for a list of recorded shorebirds at Northern Myeik Mangroves in 2013-2017

Most of them are water birds highly dependent on intertidal mud and sandflats as well as mangroves. The mangroves are of high level conservation value and together with the Southern Myeik mangroves unique in the country.

Total size: estimate 54,000 ha.

Table 2.1: Status of globally threatened and endemic species for each landscape / seascape

<i>Species</i>	<i>Scientific name</i>	<i>RL- Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR	1-2	A1	
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	14	A1	1.4%
Great Knot	<i>Calidris tenuirostris</i>	EN	150		
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	77		
Red Knot	<i>Calidris canutus</i>	NT	5		
Red-necked Stint	<i>Calidris ruficollis</i>	NT	100		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	28		
Beach Thick-Knee	<i>Esacus neglectus</i>	NT	2-5 pairs		
Black-tailed Godwits	<i>Limosa limosa</i>	NT	3		
Eurasian Curlew	<i>Numenius arquata</i>	NT	56		
Grey-tailed Tattler	<i>Heteroscelus brevipes</i>	NT	1		
Lesser Sand-Plover	<i>Charadrius mongolus</i>		2500		2.5%
Greater Sand-Plover	<i>Charadrius leschenaultii</i>		1500		1,5%
Whimbrel	<i>Numenius phaeopus</i>		204		

Species	Scientific name	RL-Status	Population Estimate	KBA criteria	Ramsar 1%
Terek Sandpiper	<i>Xenus cinereus</i>		41		
Common Redshank	<i>Tringa totanus</i>		170		
Red Breasted Parakeet	<i>Psittacula alexandri</i>	NT	30-50		
Lesser Adjutant	<i>Leptoptilos javanicus</i>	VU	2-6		
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	10		

2.2 Status of protection

The site is currently not protected. Few small areas north of Myeik have been selected and are currently managed by the Myeik University.

2.3 Protection criterion (Ramsar & KBA)

The area does not fulfil the 20,000 waterbirds threshold, but three species (Lesser Sandplover, Greater Sandplover, Nordmann's Greenshank,) fulfil the 1% population threshold Ramsar criteria. Ideally the site is joined up with the Southern mangrove area and designated together as one Ramsar site.

2.4 Threats

Coastal development and forest conversion, as well as shorebird hunting and plastic rubbish pose a serious threat to the pristine coastal habitats and urgent protection measure are proposed. Many mangrove areas are still converted into agricultural land and remaining mangrove areas are exposed to persistent logging for charcoal production.

2.5 Local involvement

Currently there is no active involvement with local communities. Myeik University is engaged in

some mangrove research and restoration project.

2.6 Outlook

A Marine Protected Area is proposed (see figure 2.1), but more detailed surveys are needed to determine exact boundaries of new protected areas, but temporary restraining borders should be immediately implemented to safeguard these precious coastal habitats for the future. It might be worth considering if this site should be combined together with the Southern Myeik Archipelago as one large protected area, such as a Biosphere Reserve covering the huge large expanses of mangroves between Myeik and Bokpyin into one large PA. Together both areas would certainly fulfil all Ramsar and KBA criteria and would also provide a huge benefit for the Myeik communities.

2.7 References

Saw, M. & C. Zöckler 2015. The bird fauna of the Myeik archipelago. Unpubl. Report for FFI.

Zöckler, C., T. Zaw Naing, S. Moses, R. Nou Soe & T. Htin Hla 2014. The importance of the Myanmar Coast for Water Birds. Stilt 66: 37-51.



Mangrove and Mudflats north of Myeik



Mangrove fishing



Fig 2.1 Proposed coastal protected area Northern Myeik Mangroves and mudflats

Beach Thick-Knee *Esacus neglectus*

Mangroves and Mudflats in Aukland Bay, near Myeik

3 Mali and Thayaw Thadangyi Islands Group

3.1 Conservation value

The area (113,000 ha) has one of the highest hard coral diversity in the country (Howard et al 2014). Very little is known about the bird fauna. However, a brief visit to the known island group in March 2017 discovered a few breeding Beach Thick-knees *Esacus neglectus* (NT) and Great-billed Herons. The inland forest areas promise to be rich in wildlife, but hunting and logging are prevalent.

3.2 Status of protection

In the Mali and Thayaw Thadangyi Islands group there is a plan for two Locally Managed Marine Areas (LMMA). In total they would cover 113,000 ha, which includes 26,000 ha of land. FFI is working together with Fisheries Department and local communities for official notification of those two LMMA. FFI is planning to expand more LMMA in the coming years in collaboration with local communities and fisheries department. Those LMMA will be connected and can become the basis for a wider MPA in collaboration with forest department, fisheries department and other concerned government departments. FFI is in consultation about the MPA plan with the government. MPA sizes are depending on the sizes of connect-

ed LMMA. In addition the valuable islands of the Torres Group have been proposed by FFI to be added as an additional MPA.

3.3 Protection criteria (Ramsar & KBA)

There is no sufficient bird numbers to qualify the site for Ramsar, but the coral reefs and also other coastal habitats have high value and justify a Ramsar designation on criteria 2: crucial habitats.

3.4 Threats

Overfishing has been a huge problem for the fish stocks and also for the rich coral reefs in the area. Hunting and logging in the inland forest areas is wide-spread and a large problem. Forest is also clear cut for expanding agriculture and urgent protection measures are necessary.

3.5 Local involvement

FFI is working together with Fisheries Department and local communities especially on Thayaw Thadangyi Island.

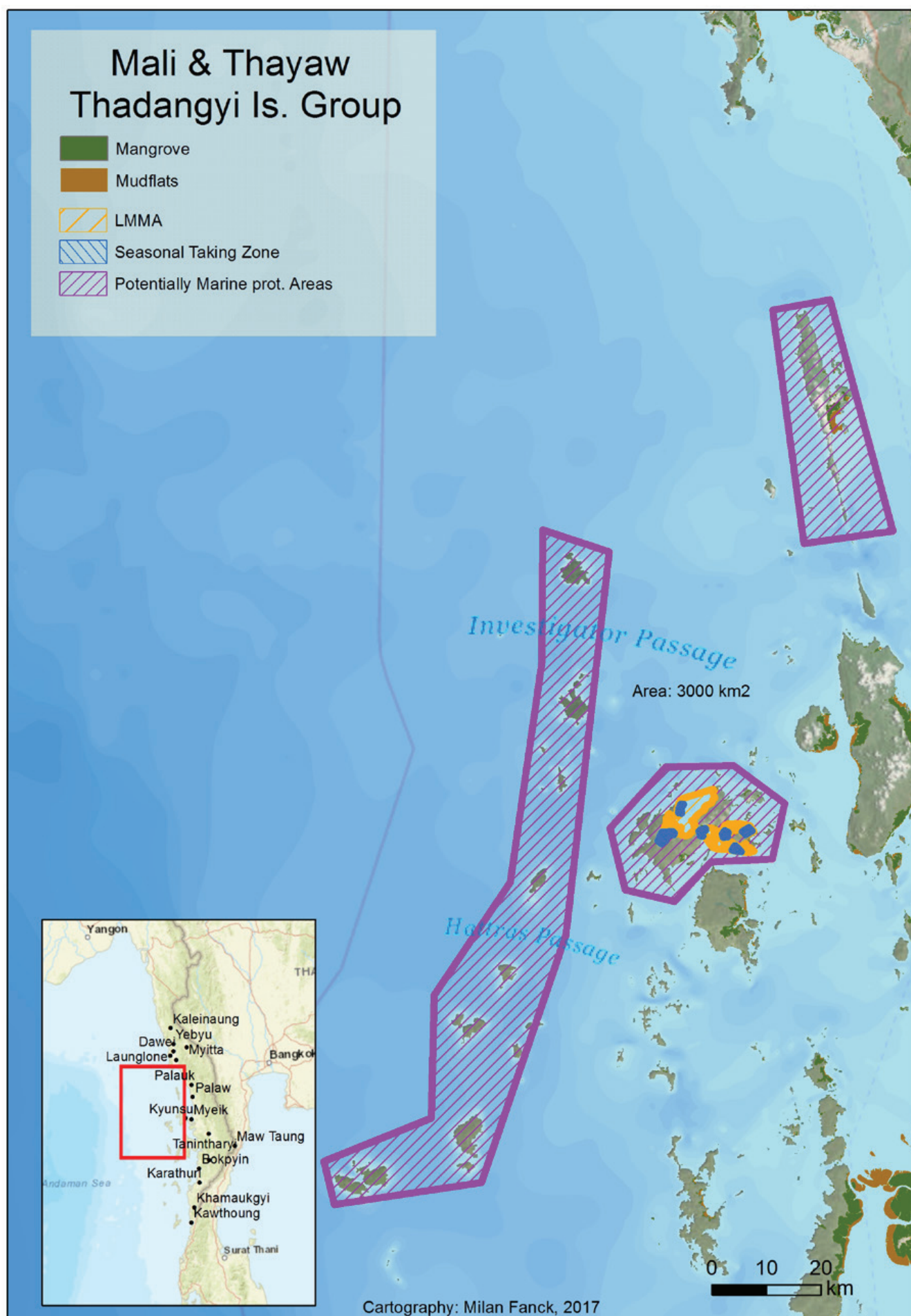


Fig 3.1 Proposed Marine Protected Areas around the islands of Mali (north), Thayaw Thadangyi (central) and other islands

3.6 References

Howard, R., Zau Lunn, Antt Maung, Salai Mon Nyi Nyi Len, Soe Thiha and Soe Tint Aung 2014. Assessment of the Myeik Archipelago Coral Reef Ecosystem, Reef Check Surveys January 2013 to May 2014. Report No. 5 of the Tanintharyi Conservation Programme, a joint initiative of Fauna &

Flora International (FFI) and the Myanmar Forest Department. FFI, Yangon.

Zöckler, C. & S. T. Lwin 2018. First breeding record of Beach Thick-knee *Esacus neglectus* in Myanmar. Wader Study 125(1): 45-47.



Thayaw Thadangyi Island



Fishing for shellfish



Thayaw Thadangyi Island



Beach Thick-knee *Esacus neglectus* near nest

4 Langann Island Group

4.1. Conservation value

The area (21,627 ha) is rich in corals and Saw Mon Hia Island in the group has the third largest diversity with 110 fish species recorded (Russell 2015). A brief bird survey in 2017 revealed some interesting observations (Connette 2017). Connette (2017) also mentions a sea turtle nesting beach but does not list the species involved. The complexity and diversity of the Island group merits more intensive surveys and more detailed information on its rich biodiversity could be revealed to describe the full status of the potential KBA site.

4.2 Status of protection

In the Langann Island Group one Locally Managed Marine Area (LMMA) has been established. Including water the proposed MPA is 21,627 ha large.

4.3 Protection criteria (Ramsar & KBA)

The area does not fulfil the strict Ramsar criteria for waterbirds 3-6, but would likely qualify for the coral reefs and possibly mangroves. The Plain-pouched Hornbill *Aceros subruficollis* might be a

trigger species for the KBA status in the area, but no count data are available at present.

4.4 Threats

Overfishing has been noticed to be an issue and collaboration with local communities by FFI has been advanced to address the issue of over-fishing. Some small scale logging has been observed at some islands.

4.5 Local involvement

The involvement of local communities is essential in developing LMMAs and expanding on existing agreements in the area.

4.6 References

Connette, G. 2017. Bird Survey of Langann Islands. Unpubl. Report for FFI.

Russell, B.C. 2015. Survey of coral reef fishes of the Myeik Archipelago, Myanmar. Report No. 13 of the Tanintharyi Conservation Programme, a joint initiative of Fauna and Flora International (FFI) and the Myanmar Forest Department. FFI, Yangon.

Table 4.1: Status of globally threatened and endemic species for Langann Islands

Species	Scientific name	RL-Status	Population Estimate	KBA criteria	Ramsar 1%
Plain-pouched Hornbill	<i>Aceros subruficollis</i>	VU	10+	B	
Mangrove Pitta	<i>Pitta megarhyncha</i>	NT			
Nicobar Pigeon	<i>Caloenas nicobarica</i>	NT			
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>	NT			
Beach Thick-knee	<i>Esacus neglectus</i>	NT			
Ruddy Kingfisher	<i>Halcyon coromanda</i>				



Langann Island shore

Robert Howard



Langann Island shore

Robert Howard



Fig. 4.1 Proposed Marine Protected Area around the Island group of Langann in Thanintharyi Region

5 Moscos Island extension

5.1 Conservation value

The island is surrounded by pristine coral reefs and is holding turtle nesting beaches and Wild boar and Sambar deer in the interior. Little detailed information is available and recent surveys have not been undertaken.

5.2 Status of protection

Moscos Island is one of the very few coastal protected areas established in 1927 to protect marine and terrestrial biodiversity on the island. An extension is planned to incorporate important hard coral reefs and existing mangrove areas. Today the area is designated as a Wildlife Sanctuary.

Currently the protected area lists 49 sqkm., but could be extended to include adjacent islands in the archipelago. The proposed extension (see map) would almost double the area protected in size.

The area was inaccessible for the general public but had been opened for selected tourism in 2015.

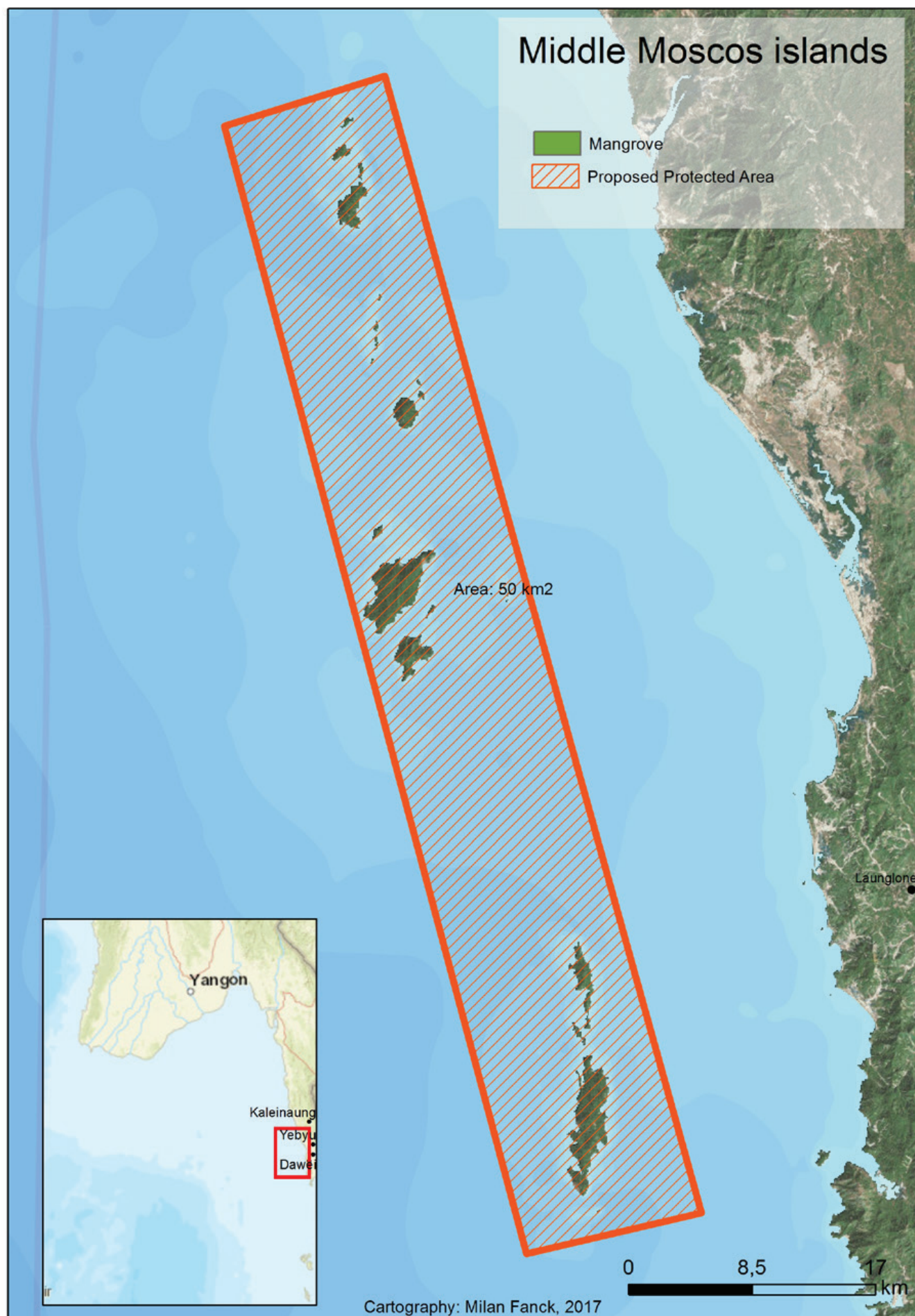


Fig 5.1 Proposed Marine Protected Area (MPA) around Moscos island

6 Dawei River Estuary

6.1 Conservation value

The Dawei River estuary consists of a range of still intact mangroves and mudflats where large numbers of resident and migratory waterbirds are wintering. Table 6.1 shows the number of water birds observed in the area in 2011.

6.2 Status of protection

The area is currently not protected. The numbers of roosting waterbirds is not exceeding any internationally significant numbers, but high numbers of present Adjutant Storks merit the KBA status for this site.

6.3 Protection criteria (Ramsar & KBA)

The 2011 survey did not reveal any waterbird numbers large enough to qualify for Ramsar. However future surveys might reveal higher numbers for some species. The large number of six Lesser Adjutant Storks might justify the area as KBA. Other taxa such as marine turtles have not been assessed.

6.4 Threats

The site is situated in the Dawei River mouth, close to the regional capital Dawei and hence exposed to near city development. At present no development plans are known for this region.

The mangroves are still in comparatively good condition as they are still connected but largely degraded by precepitant cutting. Local communities were known to go at prime roosting sites for waterbird hunting. During first meetings in 2011 BANCA and ArcCona agreed with local hunters on a hunting ban in exchange for some compensation but after a few years hunting might have resumed due to the lack of NGO presence at the site.

6.5 Local involvement

A local NGO Dawei Research Association (DRA) has been involved in local awareness raising and mangrove restoration schemes. Closer engagement with villagers in the villages around the site is needed to achieve long-term solutions on the protection of the remaining mangroves and intertidal mudflats.

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Zöckler, C., T. Zaw Naing, S. Moses, R. Nou Soe & T. Htin Hla 2014. The importance of the Myanmar Coast for Water Birds. *Stilt* 66: 37-51.

Table 6.1: Status of globally threatened and endemic species for each landscape / seascape. Count numbers derive from a survey in 2011.

<i>Species</i>	<i>Scientific name</i>	<i>RL- Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Great Knot	<i>Calidris tenuirostris</i>	EN	6		
Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>	VU	6	A1	
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	12		
Eurasian Curlew	<i>Numenius arquata</i>	NT	350-450	B	
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	30		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	15		
Red-necked Stint	<i>Calidris subruficollis</i>	NT	80		
Little Cormorant	<i>Microcarbo niger</i>		30		
Indian Pond Heron	<i>Ardeola grayii</i>		30		
Great Egret	<i>Ardea alba</i>		20		

Species	Scientific name	RL-Status	Population Estimate	KBA criteria	Ramsar 1%
Little Egret	<i>Egretta garzetta</i>		45		
Grey Plover	<i>Pluvialis squatarola</i>		50		
Red-wattled Lapwing	<i>Vanellus indicus</i>		10		
Pintail Snipe	<i>Gallinago stenura</i>		2		
Pacific Golden Plover	<i>Pluvialis fulva</i>		45		
Greater Sandplover	<i>Pluvialis leschenaultii</i>		500		
Lesser Sandplover	<i>Pluvialis mongolus</i>		700	B?	
Kentish Plover	<i>Pluvialis alexandrinus</i>		45		
Whimbrel	<i>Numenius phaeopus</i>		160-180		
Northern Greenshank	<i>Tringa nebularia</i>		15		
Common Sandpiper	<i>Actitis hypoleucos</i>		40		
Common Redshank	<i>Tringa totanus</i>		45		
Terek Sandpiper	<i>Xenus cinereus</i>		280		
Broad-billed Sandpiper	<i>Limicola falcinellus</i>		50		
Ruddy Turnstone	<i>Arenaria interpres</i>		100		
Brown-headed Gull	<i>Larus bruneicephalus</i>		300		
Gull-billed Tern	<i>Gelochelidon nilotica</i>		3		
Little Tern	<i>Sternula albifrons</i>		250		
Greater Crested Tern	<i>Thalasseus bergii</i>		100		
Lesser Crested Tern	<i>Thalasseus bengalensis</i>		20		
Whiskered Tern	<i>Chlidonias hybrida</i>		30		



Mangroves and Mudflats with fishermen



Mudflat at Kennet Thiri



Sandy beaches near Dawei

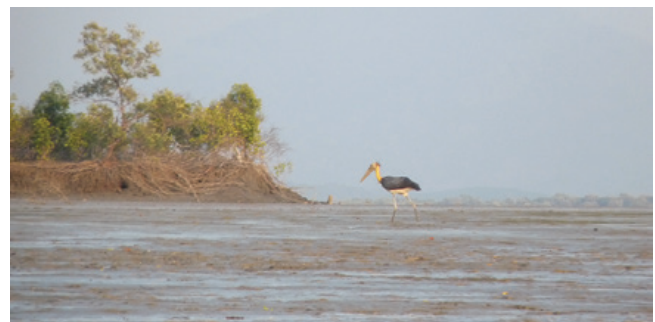
Lesser Adjutant Stork *Leptoptilos javanicus* near Dawei



Fig 6.1: Proposed Protected Area in the Dawei River Estuary

7 Hain-Ze Bay mudflats and mangroves (Tanintharyi)

7.1 Conservation value

The site consists of a large area of intertidal mudflats and adjacent mangroves. Little is known about its conservation value and the state of mangroves, as no surveys have been undertaken. Potential surveys have been hampered by access restrictions due to regional insurgent activities.

7.2 Status of protection

The approx. 27,000 ha big site near Ye on the border of Mon State and Tanintharyi region is not protected currently. Surveys to obtain baseline data are urgently needed to establish the value and potential boundaries for future protected areas.

7.4 Threats

The plan of a coal-fired power station near the site has been mentioned and local groups campaigning against it. However, little detailed information on biodiversity is available.

7.5 Local involvement

This project is interesting as it has a local conservation group that largely consists of local villagers lead by a local monk. The local people became aware of the important ecosystem services and especially the importance of the mangroves. They started doing research on the productivity of the region first. Now they are managing the mangroves at community level and are trying to get the permission for Community forestry (under the new CF law), and they grow a lots of mangroves planted in the mud flat. The activities on mangrove planting, workshop, research and training are joined by the local people leading by the monks. All are Mon people.



Fig 7.1: Proposed Future Coastal Protected Area in Hain Ze Bay

8 Southern Bilugyun and Kyaikkhami

8.1 Conservation value

This site holds extensive mudflats important for migratory shorebirds and egrets. There are also mangroves, especially on the southern part of Bilu Island, but most of the mangroves have been degraded quite severely already.

Bilu Island (Local name Bilugyun) is known as Ta Kaw Sa Man in Mon language. It is part of Chaungzone Township in Mon State, situated in opposite side of Mawlamyine. The west bank of the island has some intertidal mudflat and mangrove plants. Karoupi is in the southern part of Kyeikkhamei Sea and has sandy beaches and mudflats. Near the Karoupi village is some mangrove area.

There has been little survey work. In 2010 huge numbers of over 1000 Little and Great Egrets were found in the mudflats around the island. Also, large numbers of Whimbrel and Eurasian Curlew, but not comprehensive survey data are available. Recently, in Nov. 2018 one Spoon-billed Sandpiper has been recorded and the site might hold more SBS (BANCA).

8.2 Status of protection

Currently the area is not protected. Its close proximity to the partly designated Ramsar site Gulf of Mottama would make a nice connection with the large intertidal mudflats and mangroves. It is not clear how much the island interior should become part of a future protected area.



Former Hunters in Zigon

8.3 Protection criteria (Ramsar & KBA)

The large number of roosting egrets and also Lesser Whistling Ducks, Whimbrel and other waterbirds that have been observed in 2010 during a SBS survey might justify the designation of parts of the area as Ramsar site or KBA, but more detailed surveys are required to establish its real status.

8.4 Threats

Sand mining, deep sea port development in the south is possible. Shorebird hunting was practiced, e.g. in Zigon and might still occur in some areas on the island but BANCA hunting mitigation team has been visiting some of the villages and hunting has largely been stopped.

8.5 Local involvement

There are about 64 villages and some of the villages are situated near the coastal areas which has the local communities are relying on the fishing. One village (Ywar Lut) village is one of the famous villages for tourist attraction. There has been some handicraft production such as Burmese bamboo fabrication, tobacco pipes, walking sticks, weaving and old fashioned slat writing boards. Some products are cheroots and rubber bands. The communities at Karoupi are relying on fishing.



Water buffalos *Bubalus bubalis*



Fig 8.1 Proposed Protected Area in and around Bilugyun Island, Mon State



Mudflats south of Zigon



Typical Bilugyun Island Bus

9 Gulf of Mottama

9.1 Conservation value

The Gulf of Mottama (Former name: Martaban) is located in the Yangon, Bago and Mon State Region. The Gulf of Mottoma is a large and generally undisturbed funnel-shaped estuary with extensive tidal flats. Its tidal cycle is extremely pronounced in speed and amplitude, causing a powerful bore phenomenon which is highly unusual in the region and which makes this one of the most dynamic estuaries in the world, with constant sediment redistribution, channel-shifts, erosion and accretion on a large scale.

The high productivity of the system supports a rich biota including abundant invertebrates, important nurseries for marine fish and up to 150,000 migratory waterbirds in the non-breeding season. These include three globally threatened species and internationally important numbers of 19 species (see Table 9.1), and the Gulf is one of the world's most important wintering areas for the critically endangered Spoon-billed Sandpiper *Calidris pygmaea* (CR), hosting probably more than half of the remaining global population. The biological productivity of this system supports a rich biodiversity that exemplifies the importance of large estuaries on an international scale as source

areas for fish and invertebrates and as non-breeding refuges for tens of thousands of migratory waterbirds. Around 700 species of invertebrates (Zau Lunn *et al.* unpubl.) have been recorded. The inner Gulf is an important nursery and breeding area for the Giant Freshwater Prawn *Macrobrachium rosenbergii*, while small crabs occur in particularly large densities (up to 5,000 per square meter) in some part of the site, comprising the dominate food source for Spoon-billed Sandpipers. The most abundant species of crab is *Pinnotheres sinensis*. Small slugs, and the flies *Boleophthalmus boddarti* and *Taenioides anguillaris*, are also important food items for shorebirds. A total of 39 fish species has been recorded (Tint *et al.* 2014), most are commercial species such as Hilsa Shad *Tenualosa ilisha*, Toli Shad *Tenualosa toli*, Bombay Duck *Harpodon nehereus*, Giant Seabass *Lates calcarifer*, Four-finger Threadfin *Eleutheronema tetradactylum*, Paradise Threadfin *Polynemus paradiseus*, Flathead Sillago *Silaginopsis panijus*, as well as *Otolithoides pama*, *Sicamugil hamiltonii* and *Nemapteryx caelatus*. The Gulf of Mottama is one of the important migratory routes for the Hilsa Shad *Tenualosa ilisha*.

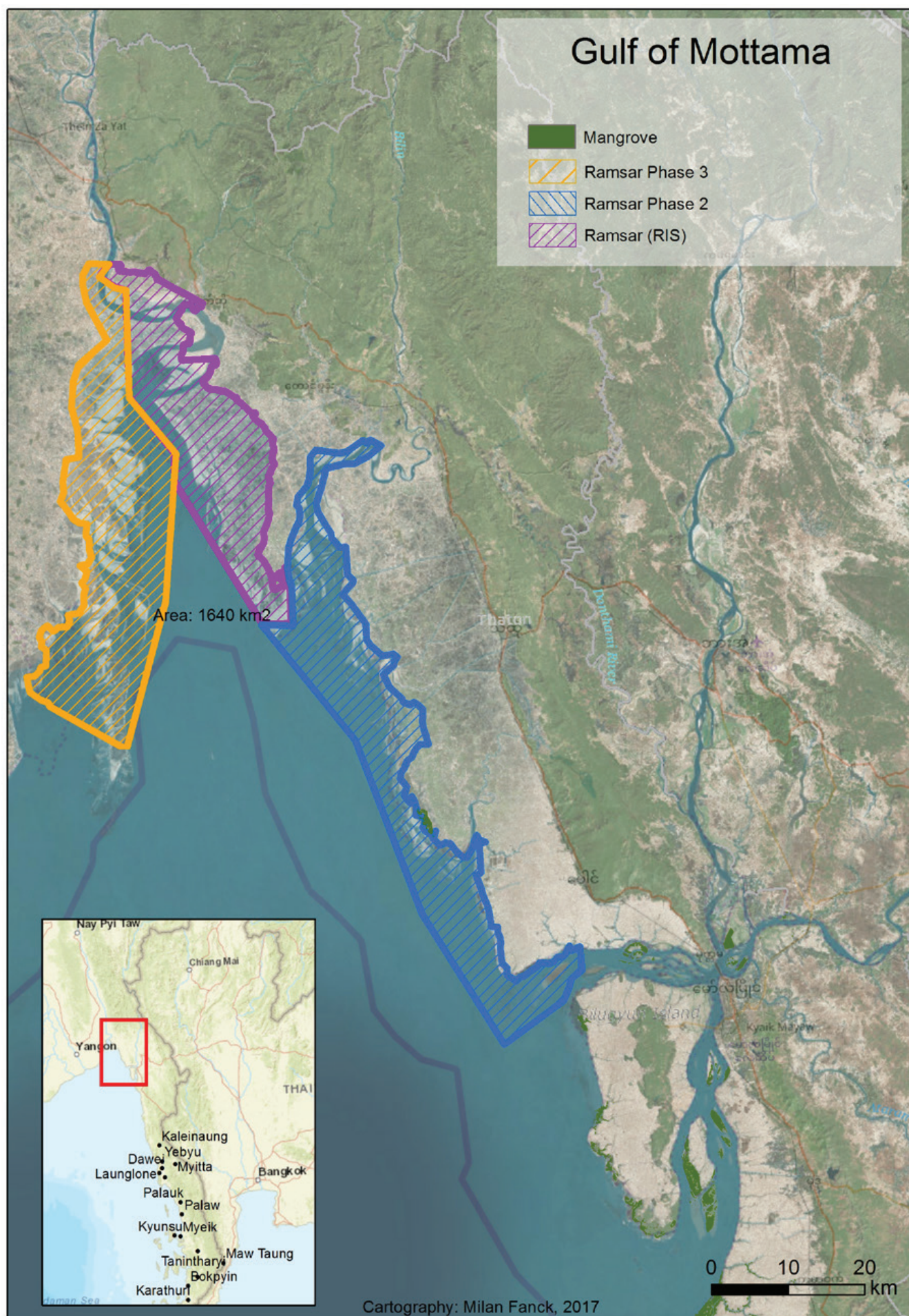


Fig 9.1 Existing (red) and proposed extended (blue and yellow) Ramsar Site Gulf of Mottama (Mon State, Bago and Yangon Region)

9.2 Status of protection

Part of the site, the top estuarine area in Mon State (townships Khaytho and Bilin) of some 40,000 ha has been designated as a Ramsar Site in May 2017. It is planned to extend the Ramsar site to include the entire Gulf of Mottama in further two or three phases (see Fig. 9.1). A second phase, also in Mon State is currently prepared for immediate submission. A further extension in the West will include the Bago region followed by Yangon region as a final fourth stage. The entire site was listed as Flyway Network site in 2016.

9.3 Protection criteria (Ramsar & KBA)

In total 19 species fulfil the 1% Ramsar criterion 6 for the entire gulf region. The recently designated area still fulfils this criterion for 12 species and any extension will in itself have at least 6 species qualified for this Ramsar criterion. In addition the gulf lists at least 11 species that fulfil one or the other KBA criteria (see table). The Mon State is planning to designate its part of the gulf (>40%) as a regional protected area.

9.4 Threats

Bird Hunting has largely stopped but partly resumed in some areas of the large gulf, but over-fishing still poses the largest threat to the area.

Illegal fishing (by using tiny small mesh size mesh) has been addressed but is still observed and rampant in the region. Currently a major long-term project funded by the Swiss Agency for Development and Cooperation (SDC) in cooperation with Helvetas, NAG, and IUCN and BANCA is addressing the livelihoods of local communities. Damming and potential drainage of the upper river systems of the Sittaung and Salween River is potentially altering the sediment and nutrient flows into the delta threatening the very value and reason for many ten thousands of water birds and livelihoods of local communities.

Pollution from a paper mill is potentially dangerous but no measurements have been carried out to assess the impact.

9.5 Local involvement

BANCA is working together with the Swiss Agency for Development and Cooperation (SDC) that started in 2015 a ten-year development project with Helvetas, NAG and IUCN to improve the local peoples livelihood and fishery prospects. BANCA has over the past years established Local conservation groups, largely consisting of former hunters and village heads and local spiritual leaders and others interested. This has been shown as a very successful mechanism engaging with the local communities and enhancing awareness and law enforcement at the same time. The community work is nested within the development work of the SDC and supported by the Mon state and regional university, which is part of the current success.

9.6 Outlook

The prospect of sustained funding through the Swiss Development Cooperation and many other organisations at a smaller scale seemed to secure the long-term ecological and socio-economic situation in the entire gulf area.

9.7 References

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Table 9.1: Status of globally threatened and endemic species for each landscape / seascape (based 2010-2014 survey data)

Species	Scientific name	RL-Status	Population Estimate	KBA criteria	Ramsar 1%
Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR	160-220	A1	60%
Painted Stork	<i>Mycteria leucocephala</i>	NT	140		1.4%
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	150-300		1.5-3%
Eurasian Curlew	<i>Numenius arquata</i>	NT	2,200-4,000	B	2,2-4%
Black-tailed Godwit	<i>Limosa limosa</i>	NT	6,000-6,500	B	3.8-4%
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	9,000-12,000	B	6.2-8.6%
Red-necked St./Little St.	<i>C. ruficollis/C. minuta</i>	NT _(RS)	9,000-12,000	B	1.4-1.8%
Pacific Golden Plover	<i>Pluvialis fulva</i>		8,000-10,000	B	8-10%
Ruddy Shelduck	<i>Tadorna ferruginea</i>		1,200		2.4%
Lesser Sand Plover	<i>Charadrius mongolus</i>		32,000	B	16.8%
Greater Sand Plover	<i>Charadrius leschenaultii</i>		1,800		2.1%
Kentish Plover	<i>Charadrius alexandrinus</i>		20,000-25,000	B	20-25%
Whimbrel	<i>Numenius phaeopus</i>		2,000		3,8%
Greenshank	<i>Tringa nebularia</i>		2,000		1.8-3.5%
Redshank	<i>Tringa totanus</i>		4,500-8,000	B	4.5-8%
Spotted Redshank	<i>Tringa erythropus</i>		1,600		5,1%
Broad-billed Sandpiper	<i>Limicola falcinellus</i>		5,000-6,000	B	5-6%
Pallas's Gull	<i>Larus ichthyaetus</i>		2,700		2,7%
Whiskered Tern	<i>Chlidonias hybrida</i>		14,000	B	1,4%



Mudflats with tidal creek entering a piece of Marsh



Crumbling shore as a result of highly dynamic system

Dog-faced Snake *Cerberus rynchops* on the mudflatForaging Whiskered Terns *Chlidonias hybrida*

10 Meinmahla Kyun and outer Delta Islands

10.1 Conservation value

The reserve was established in 1993 covering 13,670 ha in size and comprises an island about 16 miles long and 6 miles wide, covered in mangrove, some of which is badly degraded either by the storm Nargis (northern part 1/3) but also by illegal human activities such as logging, fishing and other conflicts in resource management. Meinmahla Kyun Wildlife Sanctuary and the turtle nesting islands build a natural ecological unit of mangroves and intertidal mud- and sandflats as part of the wider Ayeyarwaddy Delta and its dynamics. Together they create an area of around

50,000 ha of coastal wetland that include a large proportion of the remaining mangroves and intertidal mudflats and sandy islands that are international important for migratory waterbirds (see table 10.1) and marine turtles. Especially important is the site for wintering Nordmann's Greenshank. Nowhere else in coastal Myanmar can be found more than at this site. The reserve is currently the only site with regular observations of Fishing Cats (FD staff pers. comm.). The waters around the reserve also hold large numbers of coastal Irrawaddy Dolphins (VU). The globally critically endangered mangroves *Sonneratia griffithii* and *Bruguiera*



Fig. 10.1: Existing Wildlife sanctuary Meinmahla Kyun (yellow) and proposed expansion (blue)

hainesii, both have been recorded in the region.

10.2 Status of protection

The mangrove area is in parts protected since 1993 as Meinmahla Kyun Wildlife Sanctuary. In February 2017 the Wildlife sanctuary together with the outer delta islands was designated as Myanmar's third Ramsar site. Covering some 50,000 ha this is Myanmar's largest Ramsar site and the largest coastal protected area. In late 2018 the site was added to Myanmar's Flyway Network sites.

10.3 Protection criteria (Ramsar & KBA)

At least four waterbirds reach the important 1% Ramsar population threshold at the site. At least four further bird species would also qualify for the site to be included as a KBA. Little updated information is available on the marine turtles but at least three species are regularly nesting on the beaches, adding to the KBA listing of the site.

10.4 Threats

Even though the Central and southern parts host much more mature trees and show a diverse combination of trees there are also strong indications of constant and precipitous illegal logging, preventing the development of taller and more mature trees. This is also partly reflected by the widespread lack of woodpeckers, barbets, hornbills, parakeets and other species dependent on mature mangroves. The marine turtle numbers coming to the beaches have been declining sharply over the recent years. Although no exact numbers are available the number of marine turtle nest has decreased by over 90% in the past twelve years. Researchers from the Department of Fisheries mention the casualties in drifting and active fishing nets and increasing plastic as the main threats for the marine reptiles.

10.5 Local involvement

The reserve is under the management of the Forest Department of the MOECF with an office in Bogalay. A management agreement with the department of fishery secures co-management of the

outer island area. The Department of Fishery has been engaging effectively with local fishermen in securing turtle nesting grounds and also safeguarding key waterbird areas from bird hunting activities.

10.6 Outlook

It is highly recommended to expand the existing Wildlife Sanctuary by an extension of approx. 60,000 ha and include the adjacent mudflats and parts of the mangroves on the eastern delta, the Pyindaye peninsula and merge these with the high conservation value of the outer islands Kadongalay and Ng Man Thaung as well as the new island Masen Young west of Kadongalay. The entire area is highly dynamic and new islands appear and the mangroves are 'growing' or expanding into the outer delta with the potential for new buffer areas. A careful zonation is required that addresses the need for protecting endangered species and its habitats as well as it would allow for sustainable fishing and human activities. Eco-tourism and other sustainable and nature friendly development schemes should accompany the expansion and merger of a new and larger protected area. A Biosphere Reserve opens new ways to combine conservation goals with the well-being of local communities and creates an opportunity for both reserves to be managed under one management unit that engages with local communities and enforces the agreed conservation goals.

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Table 10.1: Status of globally threatened and endemic species for each landscape/seascape (Saw & Zöckler 2014, 2015, Zöckler 2016)

<i>Species</i>	<i>Scientific name</i>	<i>RL-Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Birds					
Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR	2-3	x	
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	48	x	4.8%
Great Knot	<i>Calidris tenuirostris</i>	EN	260		
Lesser Adjutant	<i>Leptoptilos javanicus</i>	VU	5+		
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	75	x	
Eurasian Curlew	<i>Numenius arquata</i>	NT	120		
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	400		
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT	2		
Red Knot	<i>Calidris canutus</i>	NT	12		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	250		
Red-necked Stint	<i>Calidris ruficollis</i>	NT	200		
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	4+		
Mangrove Pitta	<i>Pitta megarhyncha</i>	NT	Approx. 100	x	
Lesser Sandplover	<i>Charadrius mongolus</i>		2000		2.0%
Kentish Plover	<i>Charadrius alexandrinus</i>		1000		
Pallas's Gull	<i>Larus ichthyaethus</i>		900		
Brown-headed Gull	<i>Larus brunneicephalus</i>		2000		1.4%
Caspian Tern	<i>Hydroprogne caspia</i>		360		1.5%
Mammals					
Fishing Cat	<i>Prionailurus viverrinus</i>	VU	~10	A1	
Smooth-coated Otter	<i>Lutragale perspicillata</i>	VU	?		
Irrawaddy Dolphin	<i>Orcaella brevirostris</i>	VU	~20	A1	
Reptiles					
Loggerhead Turtle	<i>Caretta caretta</i>	VU	?		
Leatherback Turtle	<i>Dermochelys coriacea</i>	VU	?		
Green Turtle	<i>Chelonia mydas</i>	EN	?		
Olive Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	VU	~20		
Hawksbill	<i>Eretmochelys imbricata</i>	CR	?		
Mangroves					
	<i>Sonneratia griffithii</i>	CR			
	<i>Bruguiera hainesii</i>	CR			



Mangroves with Mudflats



Expanding mangroves at Pyindaye

Nordmann's Greenshank *Tringa guttifer* next to Greater Sandplover *Charadrius leschenaultii*Black-capped Kingfisher *Halcyon pileata*

11 Khaing Thaung Island

11.1 Conservation value

The 1,538 ha large island lies in the centre of the outer Ayeyarwaddy Delta and is entirely covered by mangroves and surrounded by sandy beaches and small estuaries of small channels. The high conservation value of Khaing Thaung Island derives from the mature and well preserved mangroves in the centre of the island and undisturbed sandy beaches with several turtles nesting. A night roost of over 370 Black-headed Ibises is remarkable and it appears that the roost is gathering ibises from a wide range along the delta coast.

11.2 Status of protection

The island consists of a core mangrove area and surrounding beaches and small intertidal wetlands. The area is currently not officially protected. However, according to local people the island is protected by local people's agreement that conserves the mangroves, which are of high value and little degraded if at all. The island seems to be well protected by the local community, inviting this island either to be included in the zonation of a larger eastern delta protected area or a separate community-based protected area in itself.



Fig 11.1: Proposed Community-based Protected Area Khaing Thaung, Ayeyarwaddy Delta

11.3 Protection criteria (Ramsar & KBA)

The Black-headed Ibis reaches numbers well above the 1% Ramsar threshold. This figures is based on just one count and the numbers could be even higher for this migratory ibis that regularly migrates from Western India to winter in the delta area.

11.4 Threats

No immediate threats are known and the mangroves are one of the least affected in the delta region. However little is known about unsustainable fishing and hunting practices.

11.5 Local involvement

The area seems very well been looked after by

local communities who preserve their island mangrove forest very well. It is not clear how they do it and also not clear what the ownership arrangements are. More close collaboration and engagement with the local communities is needed to establish the details about the local community involvement in protecting the islands mangroves and coastal wetlands.

11.6 References

Saw Moses, Zöckler C. 2016. Bird survey report Ayeyarwady Delta, Myanmar 29 November – 13 December 2015. Unpublished Report for FFI. Yangon 2016.

Table 11.1: Status of globally threatened and endemic species for each landscape / seascape (Saw & Zöckler 2016)

<i>Species</i>	<i>Scientific name</i>	<i>RL- Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Great Knot	<i>Calidris tenuirostris</i>	EN	2		
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	370 (night roost)	X	3,7%
Eurasian Curlew	<i>Numenius arquata</i>	NT	15		
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	6		
Red-necked Stint	<i>Calidris ruficollis</i>	NT	60		
Mangrove Pitta	<i>Pitta megarhyncha</i>	NT	?		
Booted Eagle	<i>Aquila pennata</i>		4-5!	X	
Yellow Bittern	<i>Ixobrychus sinensis</i>		1-2		
Mangrove Whistler	<i>Pachycephala grisola</i>		2+		
Forest Wagtail	<i>Dendronanthus indicus</i>		10+		



Mangrove channel outlet near the sea



Villagers at the beach



Wide sandy beaches

Forest Wagtail *Dendronanthus indicus*

12 Western Delta Islands and Coast

12.1 Conservation value

In the Western Delta area (1,500 ha) there is a range of coastal habitats of intertidal mudflats, islands and beaches that support international important water bird population as well as other globally threatened species. The Phone Taw Paey beach and the adjacent Saka Khaing Gyi Island are very important for waterbirds but also other wintering migrants such as falcons, harriers and the Spotted Eagle (VU). Both sites build an ecological unit and are linked by birds moving regularly between the sites and should be protected. The shore on the eastern side of the proposed site has been included because of the Spotted Eagle sighting and largely unaffected mangroves in the area.

12.2 Protection Status

Currently not protected. In total the proposed reserve covers some 1500 ha and could be ideal as a community-based Protected Area. Adjacent beaches have not been fully assessed and a future community based reserve could well include much larger areas, such as Kwin beach and others.

12.3 Protection criteria (Ramsar & KBA)

The presence of one Spoon-billed Sandpiper in

2010 at the island of Saka Khaing and on the Phone Beach in 2015 has triggered further searches, but without any further findings. But it is very likely that the area hosts more than one individual. Also the number of Great Knot might be higher. Future surveys might reveal more details and the KBA status of the site. Also the presence of at least one Spotted Eagle (VU) might justify the area as KBA. Other trigger species might include both godwit species and the Little Tern. With more than 1,000 Little terns the area might qualify as a Ramsar site. A flock of over-flying 400 Black-tailed Godwits in spring 2016 requires further investigation on the origin of these birds. They have not been observed roosting in the area but might have been originated from nearby areas. Any future delineation should take this into account.

12.4 Threats

There were no obvious threats observed but fishing activities appear to be extensive and it requires further investigation. According to local people no bird hunting is practiced but no thorough investigation has been undertaken so far.



Fig. 12.1. Proposed protected area of Phone Taw beach and Saka Khaing Island, Western Ayeyarwaddy Delta

12.7 References

Saw Moses, Zöckler C. 2016. Bird survey report Ayeyarwaddy Delta, Myanmar 29 November – 13 December 2015. Unpublished Report for FFI. Yangon 2016.

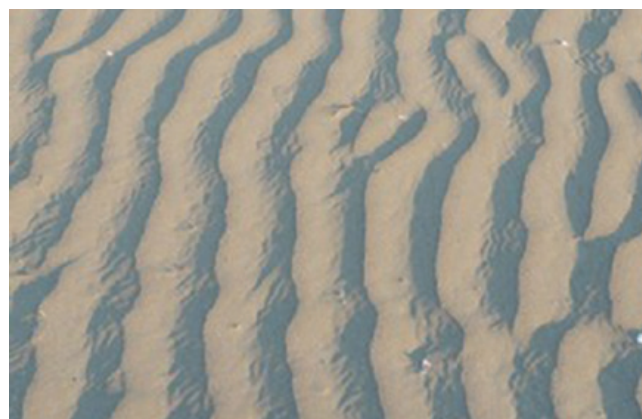
Zöckler, C., Saw Moses. 2016. Bird survey report Eastern Delta and Mawdin Coast, Ayeyarwaddy Region, Myanmar, 18 – 28 February 2016. Unpublished Report for FFI

Table 12.1: Status of globally threatened and endemic species for Phone Taw Paey Beach and Sajka Khaing Gyi (Saw & Zöckler 2016)

<i>Species</i>	<i>Scientific name</i>	<i>RL-Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Spotted Eagle	<i>Aquila clanga</i>	VU	1	x	
Eurasian Curlew	<i>Numenius arquata</i>	NT	120		
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	1		
Black-tailed Godwit	<i>Limosa limosa</i>	NT	400		
Great Knot	<i>Calidris tenuirostris</i>	EN	8		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	150		
Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR	1	x	
Red-necked Stint	<i>Calidris ruficollis</i>	NT	600		
Little Tern	<i>Sterna albifrons</i>		1000+	x	1.0%
Amur Falcon	<i>Falco amurensis</i>		1		



Saka Khaing Gyi



Ripples in tidal flats



Spoon-billed Sandpiper *Calidris pygmaea*



Bird watchers on the lookout for Spoon-billed Sandpipers

13 Thameehla Island

13.1 Conservation value

Thameehla Island, also known as Diamond Island is situated on the western outer edge of the Ayeyarwaddy Delta at the mouth of the Patheingyi River, the western branch of the Ayeyarwaddy River, approximately 10 km off the coast. The approx. 88 ha large island is forested in the center and surrounded by several sandy beaches of which four are known to host nesting turtles.

This location makes it a prime habitat for several key sea turtle species. Historically all five sea turtles were found nesting here including the Hawksbill *Eretmochelys imbricata* CR, Green Turtle *Chelonia mydas* EN, Loggerhead *Caretta caretta* VU and Olive Ridgely Turtle *Lepidochelys olivacea* VU. Today only Green Turtle is left nesting, though it declined from 549 in 1989 to only 72 in 2018. Olive Ridgely declined from 212 nests in 1986 to only 7 in 2013 and has recently not returned to the island (NWCD pers. comm.). But according to Maxwell (1912) the numbers at the end of the 19th century 120 years ago had been even 20-fold those of the late 1980s, when he reported a max of 1,2-1,6 million eggs laid by all turtles present.

13.2 Status of protection

Thameehla Island has been declared a national Wildlife Sanctuary in 1970 and is governed and managed by the Department of Fisheries the Island. In 2016 the site was included as a network site for sea turtle conservation under the CMS.

13.3 Protection criteria (Ramsar & KBA)

The endangered Green Turtle has been declining everywhere (Limpus 2012) Any nesting beach like Thameehla justifies the area to be listed as a KBA.

13.4 Threats

Uncontrolled harvesting of eggs and adult turtles has been the biggest threat in the past. Today poaching is still an issue though declining. By-catch of adult turtles drowning in fishing nets is the most severe threat threatening the few remaining turtle populations. Habitat loss, marine pollution and disturbance on the nesting beaches is also listed as common threats.

13.5 Local involvement

The Department of Fisheries is working closely with the local communities. The DoF is also involved together with the University of Yangon on a captive breeding programme. But first results in 2018 revealed problems with overheating the eggs in hatcheries producing only female turtles. Climate change could potentially exacerbate the problem of a gender mismatch.

13.6 References

FitzSimmons, N.N. and C. J. Limpus. 2014. Marine turtle genetic stocks of the Indopacific: identifying boundaries and Knowledge gaps. Indian Ocean marine Turtle Newsletter 20, 2-12.

Hopkins-Murphy, S. R., and J. S. Seithel. 2005. Documenting the Value of Volunteer Effort for the Sea Turtle Conservation in South Carolina. Chelonian Conservation and Biology. 4(4): 930-934.

Hykle, Douglas. (2013, unpublished MS). In qualified Praise of Captain F.D. Maxwell: A Precise of Captain F.D. Maxwell's report on the turtle-Banks the Irrawaddy Division.

Table 13.1: Marine Turtles and noticeable bird species (Ko Myint, Dep. of Fisheries, WCS)

Species	Scientific name	RL-Status	Population Estimate	KBA criteria	Ramsar 1%
Green Turtle	<i>Chelonia mydas</i>	EN	72 (2018)	x	
Olive Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	VU	7 (2013)	?	
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	LC	1		

Ko Myint, Maung Maung Lwin, Martin Callow, Robert Howard, Douglas Hykle, Colin Limpus, Tania Miorin and David Owens. 2017. An Update on the Research and Management Needs for the Sea Turtle Populations of Myanmar. Abst. # 258. 37th International Sea Turtle Symposium. Las Vegas, US.

Limpus, 2012. Assessment of turtle conservation actions at Thameehla Island, Myanmar within the framework of the IOSEA Technical Support/Capacity-building Programme. Report addressed to the Department of Fisheries, Myanmar. (IOSEA Marine Turtle MoU: Bangkok.

Maung Maung Lwin. 2009. Tagging activities of olive ridley turtle at Gadongalay and Gayetgyi Islands, Bogalay Township in Ayeyarwaddy division, Myanmar. Proceedings of the 4th Int. Symp. On Seastar-2000 and Bio-Logging Science. Asian p. 3-6. 2009. Kyoto, Japan.

Maxwell, F. D. 1912. Report on the turtle-banks of the Irrawaddy Division. In: Reports on the inland and sea fisheries in Thongwa, Myaungmya, and Bassein Districts and the turtle-banks of the Irrawaddy Division. Government Printing Office, Rangoon. Pp 1-57.



Thameehla Island from sea

Forest Department



Research and Conservation Point on Thameehla Island

Forest Department



Green Turtle *Chelonia mydas*

Ko Myint



Green Turtle *Chelonia mydas* hatchlings *Forest Department*



Fig 13.1. Thameehla Wildlife Sanctuary

14 Nga Yoke Kaung Coastal wetlands

14.1 Conservation value

The proposed Protected Area of the size of 3,343 ha in the Ayeyarwaddy Division is covering mangroves, sandy beaches and rocky shores. It is very diverse and of beautiful scenery. Although the area does not host exceptional rare bird species the combination of rare birds of Prey, such as White-bellied Sea Eagle that are nesting on the islands and in rocky cliffs raise the value of the area. It has been also the only place on the Mawdine coast where Pacific Swallows have been observed. Most likely these birds are also breeding in the cliffs. Furthermore the dry forest areas are of exceptional diversity. During a one hour survey of the forest areas above the rocky cliff we encountered 23 forest species. These areas are likely hosting more bird species and a thorough survey is highly recommended. In addition to the birds the area is likely to host a rich marine fauna. Pure water quality indicates the presence of corals and other marine invertebrates living in sublittoral environments. The University of Pathein is planning to investigate the marine fauna of the area.



Nga Yoke Kaung Beach



Nga Yoke Kaung Dry Forest

14.2 Status of protection

The area is currently not protected but included in the governments plans to extend the number of marine protected areas (MPA).

14.3 Protection criteria (Ramsar & KBA)

The area does not host large numbers of birds. White-bellied Eagles are nesting here, but would not qualify for any Ramsar criteria. The coral reefs and marine invertebrates are rich in the area.

14.4 Threats

The area is planned for touristic development.

14.5 Local involvement

No data available.

14.6 References

Zöckler, C. , Saw Moses 2016. Bird survey report Western Delta and Mawdin Coast, Ayeyarwaddy Region, Myanmar, 18 – 28 February 2016. Unpubl. Report for FFI



White-bellied Sea Eagle *Haliaeetus leucogaster* St. Pfützke



Nga Yoke Kaung Beach



Fig 14.1. Proposed Coastal and Marine protected area Nga Yoke Kaung, Ayeyarwaddy Region

15 Pho Htaung Gyaing Mangroves and mudflats

15.1 Conservation value

The mudflats of Pho Htaung Gyaing are located in the Ayeyarwaddy Division, surrounded by mature mangrove trees (total area: 4,027 ha). There are little signs of logging, but a few selected trees have been taken out already, but still the mangroves are in good condition.

The extraordinary value of the mudflats lies in the diversity of the benthic fauna and seagrass. It is one of the most diverse seagrass areas in Myanmar with 9 species recorded (Soe Htun 2015). Most obvious were the large numbers of huge Sea Cucumbers (*Holothuria spec.*), that were otherwise only known from sublittoral regions. The Mangroves host a number of characteristic bird species such as Collared Kingfisher, Little Heron, White-throated Fantail and Green-billed Malkoha. The mudflats harbour more than 50 Little Cormorants, 70 Little Egrets and a number of Lesser Sandplover (>70), Redshank (12), Terek Sandpiper (12) and Turnstone (8). These are not huge and significant numbers in waterbirds, but not all of the mudflat areas have been surveyed and the area is likely to host more water birds. Likewise, rarely found in littoral habitats, were *Sipinculid* worms, animals that belong to its own phylum. Many more different invertebrates like pier worms, crabs and sponges have been found in the mudflats. We also found small fish, such as the Pike Conger *Congresox spec.*, a small eel-like fish that lives in the mudflat.

Among the mangroves two globally critically endangered species are still present here.



Pho Htaung Gyaing mudflats

15.2 Status of protection

The area is currently not protected but included in the governments plans to extend the number of marine protected areas (MPA)

15.3 Protection criteria (Ramsar & KBA)

No data available.

15.4 Threats

Local villagers report about plans by some people coming from outside to establish charcoal production activities in the area. This is of great concern for the local people too and they appreciate efforts for the protection of the area.

15.5 Local involvement

Villagers in the surrounding areas showed great interest and shared concerns about the charcoal production reaching a more industrial scale. It would be good if the interest of the local villagers could be harnessed and steered into enagement in local conservation groups. The Marine Department of the University of Patheingyi has its research station not far from the area and has taken an interest in pursuing further research in the area. Future survey plans should include the entire bay and the Marine Science Department of the Patheingyi University offered help with a thorough benthos and sea grass survey of the area.

15.6 References

Zöckler, C., Saw Moses 2016. Bird survey report Western Delta and Mawdin Coast, Ayeyarwaddy Region, Myanmar, 18 – 28 February 2016. Unpubl. Report for FFI



Little Egrets *Egretta garzetta* returning at receding tide



Fig 15.1. Proposed coastal and marine Protected area Pho Htaung Gyaing, Ayeyarwaddy Region

Seaweed *Pedina* spec.Large *Holothuria* (Sea Cucumber) in mudflats

16 Kyeintali

16.1 Conservation value

Kyeintali area is located in Gwa township of Rakhine State. Long sandy beach are bordered with mangrove forest including *Bruguiera hainesii* (CR) species. Two or three globally threatened marine sea turtle species (loggerhead, leatherback and green turtle) use the sandy beaches as nesting area. Two new fish species have been discovered recently. *Channa ornatipinnis* and *C. pulchra* are two new species of the family of dwarf snakeheads (Channidae).

16.2 Status of protection

Not protected.

16.4 Threats

Overfishing and Trawling are the biggest threat to sea turtle. Egg collection has also been noticed.

16.5 Local involvement

In total 15 villages are included in the Kyeintali hot spot area. The communities are working for fishing and agriculture farming. Currently WCS is establishing a Community co-management fishing zone in the area.

16.6 References

Britz, R. 2007. *Channa ornatipinnis* and *C. pulchra*, two new species of dwarf snakeheads from Myanmar (Teleostei: Channidae). *Ichthyological Exploration of Freshwaters* 18(4)

Saw Moses 2010. Unpublished bird list of Kyeintali. Unpubl. Report for BANCA

Table 16.1: Status of globally threatened and endemic species for Kyeintali (Saw Moses 2010)

<i>Species</i>	<i>Scientific name</i>	<i>RL- Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>	VU	2		
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT	1		
Nicobar Pigeon	<i>Caloenas nicobarica</i>	NT	1		
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	2		
Great Hornbill	<i>Buceros bicornis</i>	NT	1		
Mangrove Pitta	<i>Pitta megarhyncha</i>	NT	1		
Reptiles					
Loggerhead	<i>Caretta caretta</i>	VU			
Leatherback	<i>Dermochelys coriacea</i>	VU			
Green Turtle	<i>Chelonia mydas</i>	EN			



Fig. 16.1 Proposed protected area Kyeinthali

17 Manaung and islands south

17.1 Conservation value

Manaung (previously known as ‘Cheduba’) Island is the largest island in Myanmar at just under 50,000 ha. Based on the sighting frequency, Manaung is reported to have the highest dugong population in Myanmar (Ilangakoon and Tun 2007). Dugongs are regularly observed around the island, especially on the north, west, and south shores. Located 10 km offshore of the mainland the island also boasts extensive beaches. These beaches are known to have nesting populations of five species of turtles, including the endangered Hawksbill, Green, and Loggerhead sea turtles.

17.2 Status of protection

At present there are no parts of the island protected. A proposed protected area would designate beaches and immediate offshore areas along the north, west, and south coasts of the island and would cover an area of 38,973 ha. This area includes Ye Kyun Island to the southeast of Manaung. The smaller island, Taik Kyun, is not included due to intensive agricultural cultivation across much of its area. A proper biodiversity survey of the area has not been undertaken and is urgently needed.

17.3 Protection criteria (Ramsar & KBA)

No data available.

17.4 Threats

Many of the beaches already fall into the hands of developers and maybe turned into tourist beaches that may threatened the fragile turtle nesting sites. Fishermen report regularly catching turtles and also Dugong. While some of this might be regrettable bycatch some of the fishermen might still target Dugongs deliberately for food. No other threats are known, but also little or no surveys of biodiversity or threat assessments have taken place recently.

17.5 Local involvement

Local groups are active in protecting turtle nesting sites but little resources and wider awareness is available.

17.6 References

Ilangakoon, A. D. and T. Tun 2007: Rediscovering the Dugong *Dugong dugon* in Myanmar and Capacity Building for Research and Conservation. The Raffles Bulletin of Zoology, 55(1): 195-199.

Table 17.1: Status of globally threatened species for Manaung. (Ren Naung Soe pers. comm.)

<i>Species</i>	<i>Scientific name</i>	<i>RL- Status</i>	<i>Population Estimate</i>	<i>KBA criteria</i>	<i>Ramsar 1%</i>
Mammals					
Dugong	<i>Dugong dugon</i>	VU		A1	
Reptiles					
Green Turtle	<i>Chelonia mydas</i>	EN	100	x	
Loggerhead Turtle	<i>Caretta caretta</i>	VU	50		
Leatherback Turtle	<i>Dermochelys coriacea</i>	VU	20		
Olive Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	VU	90		



Fig. 17.1. Proposed protected area Manaung Island, Rakhine



Dugong and Sea Turtle habitat in Manaung *Ren Naung Soe*



Fishing boats Manaung

Ren Naung Soe



Eastern Beach Manaung

Ren Naung Soe



Manaung Western beach sunset

Ren Naung Soe

18 Kyaukphyu Mangroves

18.1 Conservation value

Very little is known about the biodiversity of the Kyaukphyu Peninsula and its mangroves. The area still hosts one of the largest disconnected mangrove forests in Myanmar. It is not known but very likely that the mangroves also host globally threatened mangroves such as *Bruguiera hainesii* and *Sonneratia griffithii*. But at present mangroves have been cut or converted into rice paddies and other farmland. Also coastal development and the construction of an oil and gas terminal has taken its toll on the mangrove distribution and biodiversity. Still huge areas of mangroves exist in good condition and should be protected and areas of conversion restored where possible.

18.2 Status of protection

There is currently no protected area. As one of the largest remaining mangrove stands in Myanmar it is important to save at least some important areas within the Kyaukphyu island and restore where possible lost mangrove areas.

18.3 Protection criteria (Ramsar & KBA)

No data available.

18.4 Threats

The conversion of mangroves for agricultural land use has been the biggest driver of loss. But also recent construction of an oil and gas terminal and roads have had a major impact on the remaining mangrove stands.



Fishing boats Kyauk Phyu

Ren Naung Soe



Oil and gas terminal in construction

Ren Naung Soe



Mangroves in Kyauk Phyu



both Ren Naung Soe



Fig 18.1. Proposed Protected Area on Kyaukphyu Island, Rakhine

19 Nan Thar Island and May-Yuu River mouth

19.1 Conservation value

Nan Thar Island may be better described as a series of interconnected sandbars and tidal flats than a typical island. This proposed area is recognised as a KBA and it would designate 2,419 ha for protected status, which includes a small buffer around the island. The 'island' is located 20 km NNW of Sittwe and sits in the outlet of a small estuary. Before 2008 nothing was known about the biodiversity value and after a survey in 2008 and subsequent years, BANCA and ArcCona teams discovered large numbers of wintering 'Critically Endangered' Spoon-billed Sandpiper and other species.

This location makes it a prime habitat for several key sea turtle and bird species. Sea turtles found here include the Hawksbill *Eretmochelys imbricata* CR, Green *Chelonia mydas* EN, and Loggerhead *Caretta caretta* VU and Olive Ridley Sea Turtle *Lepidochelys olivacea* VU. In addition to the Spoon-billed Sandpiper *Calidris pygmaea* CR many other waterbirds congregate here, such as Spotted Greenshank *Tringa guttifer* EN, and Great Knot *Calidris tenuirostris* EN. A survey for Nan Thar Island recorded: 35 Spoon-billed Sandpipers in 2008, 14 (2009), 14 (2010), 22, (2011), 25 (2012) and 20 (2013-2016). The Island provides the necessary lagoon spit type habitat with accessible estuary and mudflat areas and is an important habitat for these species, some of which are dangerously close to extinction.

19.2 Status of protection

The area is currently not protected but has been proposed by the regional forest department of Rakhine State as a future regional protected area. Mudflats and remaining mangroves on the opposite coast should ideally be included in any future protected area delineation. In late 2018 the site was included in the EAAFP Flyway network site list as No 139 and Myanmar's third such site!

19.3 Protection criteria (Ramsar & KBA)

At least for Spoon-billed Sandpiper and Black-tailed Godwits the 1% Ramsar threshold has been

surpassed. The site is also important for several turtle species that serve as KBA trigger species for the island.

19.4 Threats

The area has been regularly subjected to bird hunting and trapping as well as turtle egg collection. Sand mining for construction poses an additional threat.

19.5 Local involvement

There are five villages which are close to Nan Thar Island and few fishing community are going to fishing near the area from the five villages. Work by the Sittwe based local NGO BECAR together with ArcCona and BANCA with the local community to stop the hunting pressure has been partly successful but require longer term commitments.

19.6 References

BANCA 2017, National species action plan for the conservation of Spoon-billed Sandpiper *Calidris pygmaea* in Myanmar January 2017 – December 2020, <http://www.banca-env.org/wp-content/uploads/2018/07/sbs-action-plan-2017-2020.pdf>

Important Bird and Biodiversity Areas (IBAs) in Myanmar, <http://datazone.birdlife.org/site/results?thrlev1=&thrlev2=&kw=®=0&city=145&snm=&fam=0&gen=0&spc=&cmn=>

Pyae Phyo Aung *et al.* 2016, Monitoring Programme for critically endangered Spoon-billed Sandpiper on its globally most important wintering grounds in Myanmar, unpubl rep f ban

Pyae Phyo Aung *et al.* 2016, Communication Education Participation Awareness (CEPA) Programme in Nanthar Island, Rakhine State

Pyae Phyo Aung *et al.* 2017, Monitoring Migratory Shore Birds Survey in Nanthar Island, <http://www.banca-env.org/wp-content/uploads/2018/07/monitoring-of-migratory-nanthar-island.pdf>

Spoon-billed Sandpiper Task Force (various). News bulletins - accessible at <https://www.eaaf-lyway.net/project/spoon-billed-sandpiper-task-force/>

Zöckler, C., T. Htin Hla, N. Clark, E. Syroechkovskiy, N. Yakushev, S. Daengphayon & R. Robinson 2010. Hunting in Myanmar: A major cause of the decline of the Spoon-billed Sandpiper. Wader Study Group Bulletin, 117: 1-8.

Zöckler, C. & P. Frew 2011. Unusual feeding behaviour of Nordmann's Greenshank *Tringa guttifer*. Wader Study Group Bulletin 118(1): 68.

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Zöckler, C., Beresford, A. E., Bunting, G., Chowdhury, S. U., Clark, N. A., Fu, V. W. K., Htin Hla, T. Morozov, V.V., Syroechkovskiy, E.E, Kashiwagi, M., Lappo, E. G, Tong, M., LeLong, T., Yat-Tung Y., F. Huettmann, F., Akasofu, H. K., Tomida, H. and G. M. Buchanan 2016: The winter distribution of the Spoon-billed Sandpiper *Calidris pygmaea*. Bird Conserv. Internat. 26: 476-489.

Table 19.1: Marine Turtles and birds on Nan Thar Island

Species	Scientific name	RL-Status	Population Estimate	KBA criteria	Ramsar 1%
Reptiles					
Leatherback Turtle	<i>Dermochelys coriacea</i>	VU	5		
Green Turtle	<i>Chelonia mydas</i>	EN	70	x	
Olive Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	VU	50		
Birds					
Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR	25	A1	6,2%
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	5	A1	
Great Knot	<i>Calidris tenuirostris</i>	EN	156	B	
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	20	B	
Great Thick-knee	<i>Esacus recurvirostris</i>	NT	-		
Eurasian Curlew	<i>Numenius arquata</i>	NT	69		
Black-tailed Godwit	<i>Limosa limosa</i>	NT	1800		1,8%
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	5		
Red Knot	<i>Calidris canutus</i>	NT	35		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	130		
Red-necked Stint	<i>Calidris ruficollis</i>	NT	280		
Bar-headed Goose	<i>Anser indicus</i>		1100		
Northern Pintail	<i>Anas acuta</i>		3000		
Eurasian Wigeon	<i>Anas penelope</i>		1200		
Grey Plover	<i>Pluvialis squatarola</i>		195		
Greater Sandplover	<i>Charadrius leschenaultii</i>		250		
Lesser Sandplover	<i>Charadrius mongolus</i>		1000		

Species	Scientific name	RL-Status	Population Estimate	KBA criteria	Ramsar 1%
Common Redshank	<i>Tringa totanus</i>		300		
Terek Sandpiper	<i>Xenus cinereus</i>		85		
Broad-billed Sandpiper	<i>Limicola falcinellus</i>		330		
Dunlin	<i>Calidris alpina</i>		4		
Sanderling	<i>Calidris alba</i>		215		
Gull-billed Tern	<i>Gelochelidon nilotica</i>		130		
Little Tern	<i>Sternula albifrons</i>		365		



Nan Thar Island

Great Knots *Calidris tenuirostris* at Nan Thar Island

Ren Naung Soe

Nest of Leatherback Turtle *Dermochelys coriacea*

Ren Naung Soe

*Calidris pygmaea* Lime 27 wintering in Nan Thar Island for five consecutive winters

Ren Naung Soe



Fig 19.1. Planned Protected Area at Nan Thar Island and adjacent coastal wetlands, Rakhine

Overall outlook and conclusion

Myanmar's 3000 km coast offers a large variety of important wetlands. They range from Mangroves, coral reefs to vast intertidal mudflats and lagoons behind sandy beaches. All these habitats serve a wide range of biodiversity, including migratory water birds that travel from as far as Arctic Russia, Alaska and the Tibetan Plateau or marine turtles wandering across the Indian ocean. But these wetlands also serve an indigenous fauna and flora, some of which are globally critically threatened, such as several different marine turtle species, rare mangroves and mammals.

Myanmar has taken responsibility and only in recent years secured more than 100,000 ha of coastal wetlands as Ramsar sites and Protected Areas. More is to come and this document is aiming to guide the process of further protection. There is still a need for inventories for some of the wetland sites, in particular for the Rakhine region and regular monitoring of its biodiversity is recommended. However, this report already demonstrates the huge importance of Myanmar's coastal wetlands for biodiversity but also for the local people that rely on these wetlands and their ecosystem services for their livelihoods and well being.



Acknowledgements

We are grateful for the Lighthouse Foundation, Hamburg, who kindly supports the report.

The report is based on the conservation work of many individuals from different organisations in Myanmar surveying and working on coastal wetlands over the past ten years. We are grateful for MoECAF, now MONREC and Ministry of Fisheries and Marine Resources for supporting and granting permissions to surveying these often remote coastal sites. In particular we like to thank Zau Lunn, Frank Momberg, Saw Moses, Naing Lin, Aung Moe, Ren Naung Soe, Thant Zin Tun and Shane Thu Lwin for their contributions. BANCA, FFI and many other organisations, such as the RSPB, IUCN and Woodside supported coastal surveys and the monitoring of coastal wetlands. Robert Howard (FFI) supported us with accessing unpublished literature.

Hilger Lemke and Matthias Fanck helped with the layout of the report, and Milan Fanck provided the map design.



Funded by the Lighthouse Foundation, Hamburg, Germany

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