

**The Water Bird Survey of the Southern Myeik Archipelago -  
November – December 2016 and Jan 2018**



## Summary

A bird and mangrove survey of the Southern Myeik Archipelago between Kawthaung in the south and Sakhan Thit, Kan Maw Pan Thaung and Thayawtadagyi Island has been conducted for the second and third time in the region from Nov 2017 and Jan 2018. Together with previous surveys the team found a total of more than 260 different bird species, counted water birds and further assessed the status of the mangroves. One of the globally critically endangered Spoon-billed Sandpipers was found again at the same site in Bokpyin as in 2016 and at least 40 endangered Nordmann's Greenshank were confirmed for the mudflats at three different sites, of which one site Yay Ngan was new near the Bokpyin. Great Knot was observed in about 350-400 birds but large flocks like near Kan Maw Island were not observed. Large numbers of 1000 Curlews roosted near Bokpyin constituting together with other flocks well over the Ramsar threshold of this near threatened species. Another new species for Tanintharyi and Myanmar was the Chinese Egret. This globally as 'vulnerable' classified Egret has been observed in 37 individuals from five new sites. Together with 28 individuals recorded previously in Feb/March 2017 near Kan Maw Island the species is considered wide –spread across the mangrove mudflat complex exceeding the 1% Ramsar threshold for this species reaching easily 10% of the global population estimate! The southern Myeik mangroves and mudflats are crucially important for over 24,000 *Larolimicolae* (Waders and Gulls), easily exceeding the 20,000 Ramsar threshold for criterion 3. 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. Eight Waterbird species have been recorded in numbers of 1% of the flyway population or higher, fulfilling further criteria of the survey area for a wetland of international significance of the Ramsar Convention. A total of 9 Lesser Adjutant Stork were observed of which 4-5 could be added to the previous recorded total of 49 birds, supporting the survey area as a Key Biodiversity Area (KBA). In addition to the waterbirds surveys on the threats posed by hunting and trapping were conducted and measures taken where necessary. A cluster of four different Ramsar sites and a Biosphere Reserve are proposed to safeguard the mangrove and mudflats system and its species of international importance.

## Introduction

For the third and fourth time previously unsurveyed areas in the southern Myeik Archipelago were surveyed for birds, mammals and mangroves. Key areas for birds were revisited to monitor the waterbird and mangrove bird and mammal populations from 25-30 November 2017 and 17-20 January 2018 on behalf of Fauna Flora International (FFI), Chances for Nature and the Manfred-Hermesen Foundation (MHS).

This report focusses mainly on the areas previously little visited or considered of high importance between Sakhan Thit Island and Bokpyin and Kanbyin Beach north of Myeik. The expedition results are summarised and the status and threats for birds and their habitats assessed. A particular focus has been on coastal habitats, especially intertidal mudflats and mangroves.

Special emphasis in this report is given to Waterbirds. In particular migratory waders or shorebirds that utilise intertidal mudflats and mangroves in the area are featuring in this report in assessing and preparing the Ramsar criteria for the site.

Previous results of the December 2013, 2014, 2016 and spring 2017 survey have been summarised and included in an overview of coastal habitats for waterbirds in Myanmar (Zöckler et al. 2014, 2016, 2017).

In addition a hunting mitigation mission in areas previously visited near Bokpyin was carried out in collaboration with BANCA and support of BCF.

## Survey methods

Surveys to the mudflats and mangroves between Sakhan Thit and Bokpyin were conducted by Dr Christoph Zöckler and assisted by Shane Thu Lwin (Dawei Research Association) and Paey Phyo Aung (BANCA). Another survey team lead by Saw Moses U Soe Naing, Zaw Aung and two volunteers from Hong Kong went to the northern Myeik archipelago and mudflats.

**Table 1: Itinerary of the Myeik bird survey Nov 2017**

Date - Nov/Dec	Means of Transport	Location Team 1	Location Team 2
23	Boat	Mudflats just south of Myeik	Myeik to Thit yar wa to Kanbyin village
24	Boat	Sakhan Thit	Kanbyin beach south
25	Boat	Medaw , camp near Yin Yan Aw	Kanbyin beach north
26	Boat	Yay Ngan Kyi	Hsat Thaung Island
27	motorbike	N Bokpyin Nipa village	Kanbyin beach south
28	Boat and bus	N Bokpyin , Kamachaung, rtn to Myeik	Thit yawar River mangrove
29	Myeik	Myeik	Rtn to Myeik
30	Boat and small boat	Myeik	Kyung hsinye Island
1st	Ferry to Myeik	Myei -Sakhan Thit	Pataw Island Hill
2nd	Mangrove Festival Myeik	Sakhan Thit Mangrove Festival	Sakhan Thit mangrove Festival

It was fortunate that the same boat and boatman Muil Lwin from the previous visit was available for the survey south. This boat and driver turned out to be well equipped and suited for negotiating the shallow waters in the mangrove channels but also more importantly, this boat and driver was able to access shallow mudflat areas and approaching high tide roost sites. But some more shallow waters

needed to be negotiated by converting to smaller fishing boats that were often available for a small fee.



**Survey boat near Medaw Nov 2017**

**Photo C. Zöckler**

Bird records include sightings as well as sound records and in very few cases tracks (footprints, feathers corpses). Binoculars (8 and 10x 40) as well as three zoom telescopes (30-70x 85) were used for bird observation. Digital camera were used to capture photos and often identify birds in blown-up images. In addition sound recordings with Telinga Parabolic microphones were used to obtain additional information on more secretive species. All birds were recorded on a daily basis with numbers where possible or useful (see annex of species list) and most bird recordings were also tagged with GPS coordinates. A mobile phone device, recently specifically developed and prepared for bird as well as mangrove status survey recording, using a KOBE smart phone app adapted to Myanmar bird and mangrove specifications.

The state of degradation of mangroves visited was assessed using a recently devised method, also adapted for a smart phone app, suitable for ground surveys during a rapid assessment across large mangrove areas from land and boat.

### **Bird species and waterbird counts**

A total of over 200 bird species have been recorded during the survey period. See annex 1 for a full species list. Including this survey a total of over 260 bird species have now been recorded in the Myeik Archipelago in the years from Dec 2013- Jan 2018.

This report emphasises on the waterbird count results of the three recent surveys from November 2017 and Jan 2018, but refers to and summarises previous reports from the years 2013, 2015, March 2016, Nov 2016 and March 2017 respectively in tables 2-4 and figures (Saw Moses 2014, Zöckler 2016, Zöckler et al 2017).



Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR	1		2	2	1	5-6
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	5	3	23	20+	40-48	50-60
Great Knot	<i>Calidris tenuirostris</i>	EN	-	840	350	2250	380	2500
Far-Eastern Curlew	<i>Numenius madagascariensis</i>	EN				1		
Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>	VU	19	22	7	8	9	50-75
Plain-pouched Hornbill	<i>Aceros subruficollis</i>	VU	199	9	13	10		>200
Great Slaty Woodpecker	<i>Mulleripicus pulverlintus</i>	VU	8	3	-	3		
Chinese Egret	<i>Egretta eulophotes</i>	VU				28	37	100
Pale-capped Pidgeon	<i>Columba punica</i>	VU	10				7	
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	10	18	-	-	21	20-25
Grey-headed Fish Eagle	<i>Ichthyophaga ichthyaetus</i>	NT	2			4		10
Red-breasted Parakeet	<i>Psittacula alexandri</i>	NT	1		>10	>40		
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	113	35	3	28	5	(2400)
Chestnut-bellied Malkoha	<i>Phaenicophaeus sumatranus</i>	NT	-	2	-			
Red-throated Barbet	<i>Megalaima rafflesii</i>	NT	-	1	-			> 10
Mangrove Pitta	<i>Pitta megarhyncha</i>	NT	25	76	2	24	3	(5050)
Beach Thick Knee	<i>Esacus neglectus</i>	NT	2	2		3	2	40-50??
Eurasian Curlew	<i>Numenius acquata</i>	NT		1650	1300	2500	1400	3000
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	20	230	350	300	263	600
Black-tailed Godwit	<i>Limosa limosa</i>	NT			200	-	-	300
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT	-	25	-	4	-	50
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT		20	100	-	-	200
Red-necked Stint	<i>Calidris ruficollis</i>	NT		30	350	110	340	500

The following results focusses on three globally threatened species.

### **Spoon-billed Sandpiper *Calidris pygmaea* (CR)**

On 25 November 2017 one Spoon-billed Sandpiper was observed feeding among a flock of small waders of about 500 birds near the town of Bokpyin at the River mouth of the Bokpyin channel just north of the town (see also Figure 2). This constitutes the second record of these globally critically endangered birds in the southern Myeik Archipelago after its first observation exactly a year before at the same place. Unfortunately the birds could not be relocated the following day and it shows the volatility of the birds and that there might be even more individuals roosting in the vast mudflat areas of south and north of Bokpyin. However a visit of the same area on 23 January 2018 by SM and STL at the high tide roost near the same location confirmed still one bird present in the area.

The area around Bokpyin appears to be suitable for this species and further wintering birds might roost here. The area is difficult to survey as access is only possible via small boats. Together with the 1-2 birds in Thetyewar (Kanbin Beach) Beach north of Myeik, the Myeik archipelago might host an estimated 5-6 wintering birds. However, in Nov 2017 no Spoon-billed sandpiper could be observed in Kanbyin beach again and it is feared that this site is no longer visited.



**Nordmann's Greenshank *Tringa guttifer* (EN)**



**Nordmann's Greenshank feeding in mudflats at Nipa village. Bokpyin 27 Nov 2016 CZ**

A new site was found with at least 9 birds in Yay Ngan mudflats c50 km north of Bokpyin (see Fig. 3). In Nipa, just north of Bokpyin, there were at least 17 birds. Furthermore a record total of 14 Nordmann's Greenshank were observed in Thetyewar or Kanbyin Beach during the same period. Altogether, these observations confirm the importance of these sites for the globally threatened species and the Myeik mangroves and mudflats constitutes the second largest flock of Nordmann's Greenshank in Myanmar after 46-48 birds have been found wintering in the Ayeyarwaddy Delta (Zöckler 2016).

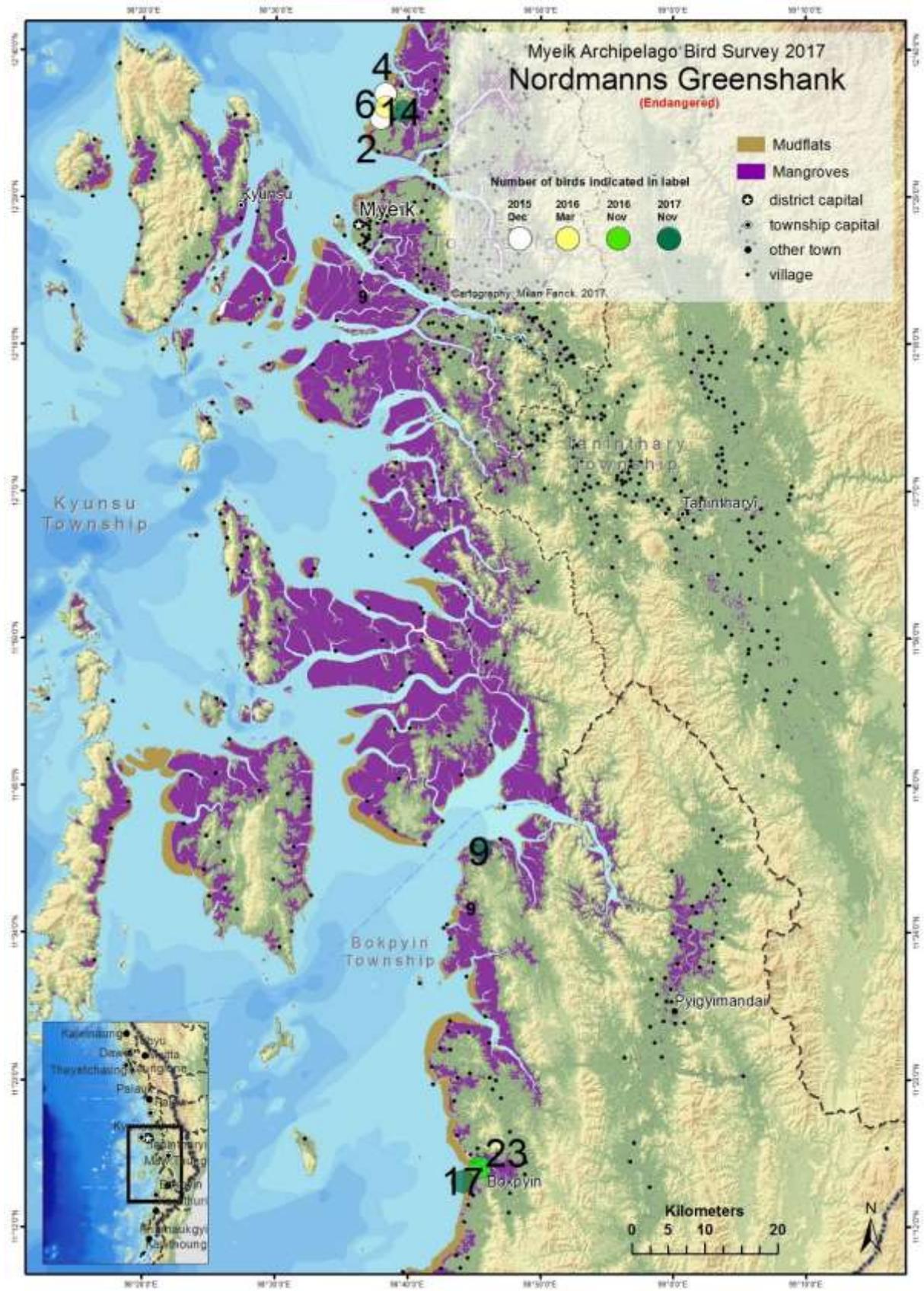


Figure 3: Distribution of Nordmann's Greenshank *Tringa guttifer* in the Myeik Archipelago by Nov 2017

### **Chinese Egret *Egretta eulophotes* (VU)**

This rare and range-restricted Egret has not been observed in Myanmar before February 2017. The egret considered globally as 'vulnerable' has been observed with additional 37 individuals from another five new sites (see Fig. 4). Together with 28 individuals recorded previously in spring 2017 at different sites near Kan Maw Island at least 58 individuals have been present in the area and the species is now considered widespread across the mangrove mudflat complex, exceeding the 1% Ramsar threshold for this species. It is considered as been missed during previous surveys and possibly reaching easily 10% of the global population as estimate (Li et al 2007)! In spring 2017 at least 28 birds were recorded around Kan Maw Island. On 27<sup>th</sup> of February 2017 a total of 18 birds were roosting at high tide with several Great Egrets (*Egretta alba*) in mature mangroves. In November 2017 a total of 24 individuals roosted in mangroves at Medaw beach (see also Fig. 4). At all sites a high affinity with mature mangroves was observed. These birds are migratory from a small breeding range in the Northern Yellow Sea and the Chinese Russian border area. Their total population is estimated at 2,600-3,400 mature birds. Even though this might be a slight underestimate as new sites have been found in southern China (BirdLife International 2017), the Myeik archipelago is likely hosting a much larger population than the observed 65 birds and is surpassing the 1% Ramsar criteria for the species (see also table 5).



**Chinese Egret *Egretta eulophotes* in 27 Nov 2017 Nipa mudflats near Bokpyin**

**C. Zöckler**

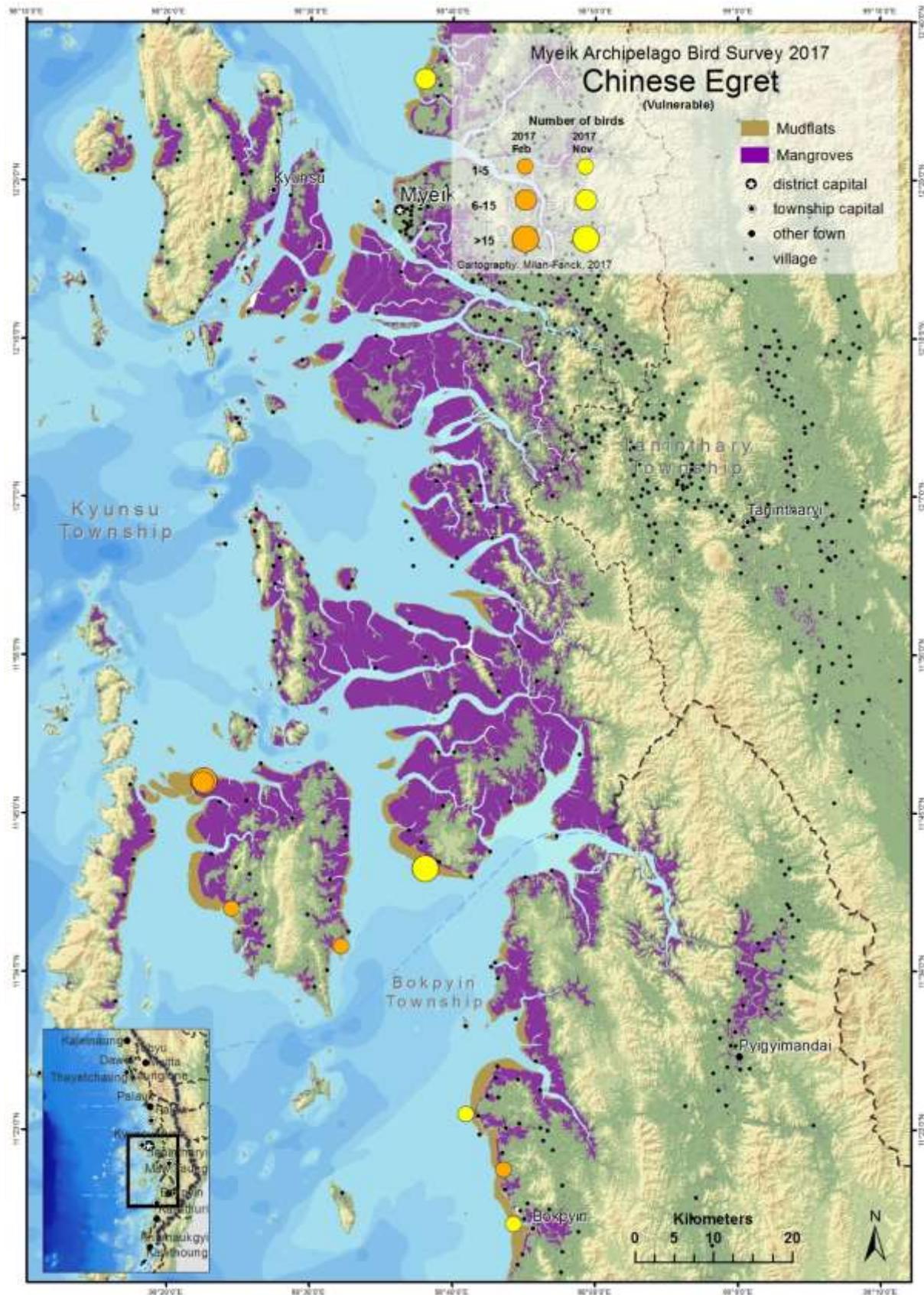


Figure 4: Distribution of Chinese Egret *Egretta eulophotes* in the Myeik Archipelago

## Waterbirds (Waders, Gulls and Terns (*Larolimicolae*) in Southern Myeik Archipelago

Waders or shorebirds are particularly important for coastal habitats and their abundance indicates a healthy ecosystem and have received special attention in this report. Among the total of 170 species recorded during this survey the shorebird, gulls and tern species are most numerous with 30 species and most abundant totalling around 24,000 individuals (see Table 3). Of these there are three globally threatened and eight near-threatened species but also other East Asian migrants that winter regularly in the Myeik archipelago in large numbers. Table 1 summarise the numbers for areas visited south of Myeik. The first half of March is for many migrants already migration period and we cannot be entirely sure that the figures observed represent the wintering population in the area.

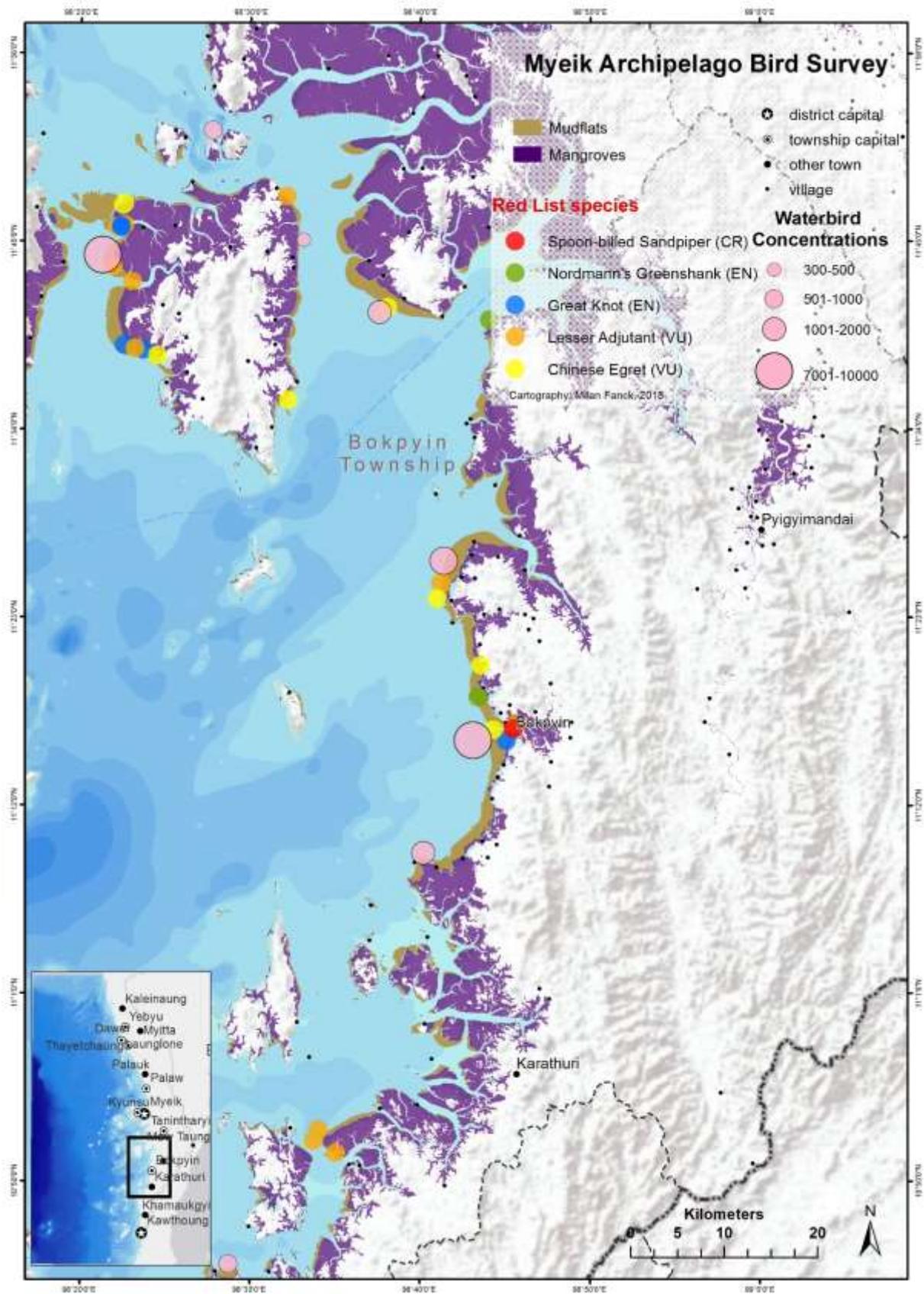
**Table 3: Distribution and abundance of waterbirds (shorebirds, gulls and terns (*Larolimicolae*) in the Southern Myeik Archipelago during three survey periods between March 2016 and Jan 2018; site names see Map 1; total maxima for each site from different survey periods; Migrant Status: R=resident, A=Arctic, HA=High Arctic, T=Temperate, B= Boreal, species qualifying for the 1% Ramsar flyway population criteria in at least one season are highlighted in yellow**

Species	Scientific name	RL	Ram sar 1%	Total 2016-2017	Kawth oung 10 Mile	Ma Tea	Chau ngph aki	Me daw	Yay Ngan	Bokpyin max.	Kan Maw West	Kan Maw East	Sakh an Thit
Pacific Golden Plover	<i>Pluvialis fulva</i>			429	24				210	45	150		
Grey Plover	<i>Pluvialis squatarola</i>			100			7		1	60	30	2	
Red-wattled Lapwing	<i>Vanellus indicus</i>			2						2			
Little Ringed Plover	<i>Charadrius dubius</i>			5						5			
Kentish Plover	<i>Charadrius alexandrinus</i>			1308	8	40				250	1000		10
Lesser Sand-Plover	<i>Charadrius mongolus</i>			2925	13	10	900	50	500	1100	100	2	250
Greater Sand-Plover	<i>Charadrius leschenaultii</i>			240			10		50	100	20	20	40
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT		388				8	90	50	240		
Black-tailed Godwit	<i>Limosa limosa</i>	NT		200							200		
<b>Whimbrel</b>	<b><i>Numenius phaeopus</i></b>		<b>1.9</b>	<b>928</b>	<b>2</b>	<b>40</b>	<b>30</b>	<b>250</b>	<b>170</b>	<b>200</b>	<b>500</b>	<b>191</b>	<b>55</b>
<b>Eurasian Curlew</b>	<b><i>Numenius arquata</i></b>	<b>NT</b>	<b>(2.4)</b>	<b>2426</b>	<b>2</b>		<b>24</b>	<b>5</b>	<b>120</b>	<b>1900</b>	<b>400</b>		<b>1</b>
Far-Eastern Curlew	<i>N. madagascariensis</i>	EN		1						1			
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT		24					20		4		
<b>Terek Sandpiper</b>	<b><i>Xenus cinereus</i></b>		<b>(1.4)</b>	<b>818</b>	<b>50</b>	<b>17</b>		<b>20</b>	<b>220</b>	<b>100</b>	<b>400</b>		<b>1</b>
Common Sandpiper	<i>Actitis hypoleucos</i>			54	2		12	5	6	30	10	2	9
Common Greenshank	<i>Tringa nebularia</i>			120	30	1			35	45	50		
<b>Nordmann's Greenshank</b>	<b><i>Tringa guttifer</i></b>	<b>EN</b>	<b>3.2</b>	<b>32</b>					<b>9</b>	<b>23</b>			
Marsh Sandpiper	<i>Tringa stagnatilis</i>			1	1								
<b>Common Redshank</b>	<b><i>Tringa totanus</i></b>		<b>2.9</b>	<b>2948</b>	<b>320</b>	<b>90</b>	<b>1</b>	<b>500</b>	<b>220</b>	<b>280</b>	<b>1200</b>	<b>88</b>	<b>249</b>
Wood Sandpiper	<i>Tringa glareola</i>			3		1			2				
Great Knot	<i>Calidris tenuirostris</i>	EN		2400						250	2150		
Sanderling	<i>Calidris alba</i>			2						2			
Little Stint	<i>Calidris minuta</i>												
Red-necked Stint	<i>Calidris ruficollis</i>	NT		353					2	350	1		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT		116					16	50	50		

Spoon-billed Sandpiper	<i>Calidris pygmaea</i>	CR		2						2			
Broad-billed Sandpiper	<i>Limicola falcinellus</i>			20						20			
Ruddy Turnstone	<i>Arenaria interpres</i>			25					12	12		1	
Brown-headed Gull	<i>Larus brunneicephalus</i>		(2.5)	5444	30	8	50	480	1290	1500	2000	1	85
Mew Gull	<i>Larus canus</i>			1						1			
Gull-billed Tern	<i>Gelochelidon nilotica</i>		0.8	314		20	1		88	155	50		
Lesser Crested Tern	<i>Sterna bengalensis</i>			214		20	4		160	20	10		
Greater Crested Tern	<i>Sterna bergii</i>			765	2	400	20	3	90	200	50		
Common Tern	<i>Sterna hirundo</i>			974				20	4	50	900		
Little Tern	<i>Sternula albifrons</i>			1045		170	50	20	70	650	3	2	80
White-winged Tern	<i>Chlidonias leucopterus</i>			-							1		
Whiskered Tern	<i>Chlidonias hybrida</i>			8	1					5	2		
<b>Total</b>				<b>24384</b>	<b>485</b>	<b>817</b>	<b>1109</b>	<b>1361</b>	<b>3385</b>	<b>7458</b>	<b>9521</b>	<b>309</b>	<b>780</b>

\*Many mudflat areas were inaccessible and many more waders could roost there

The number of waders could be even higher, as many sites in the survey area were not accessible or have not been visited during this survey. For selected species and for some that are globally near-threatened the Southern Myeik Intertidal mudflats are very important. Figure 5 depicts the overall waterbird concentrations and those of globally threatened species in the southern Myeik archipelago south of Sakhan Thit. This area between Sakhan Thit in the north and Karathuri in the south alone hosts already an estimated 24.000 waterbirds (see also Table 3). Of these important waterbird areas Kan Maw West, Bokpyin and also to a lesser extent Yay Ngan are very important, each hosting over 7.000 waterbirds and Yay Ngan over 3.000 individuals. Bokpyin has the highest concentration of globally red-listed species with all five globally threatened waterbird species occurring and partly in good numbers, as in the example of the Nordmann's Greenshank (max 23 in Nov 2016).



**Figure 5: Significant Waterbird concentrations of over 300 to maximum of almost 10.000 birds (pink circles enlarged according to size in four different size categories) and five globally threatened waterbird species (CR:1, EN: 2, VU:2)**

## Waterbirds (Waders, Gulls and Terns (*Larolimicolae*) in Northern Myeik Archipelago

Surveys in the northern Myeik archipelago, especially in Kanbyin Beach area have been undertaken between Dec 2013 and Nov 2017 (Moses & Zöckler 2016 and this report). The area is much smaller and fewer waterbirds are recorded from this area (see Fig. 7), but all five globally threatened waterbirds recorded in the southern Archipelago also have been recorded here, plus a number of near-threatened water birds (see Table 4). In total more than 3.000 waterbirds have been recorded in the area and it is included in the cluster of sites that are proposed for Ramsar designation.

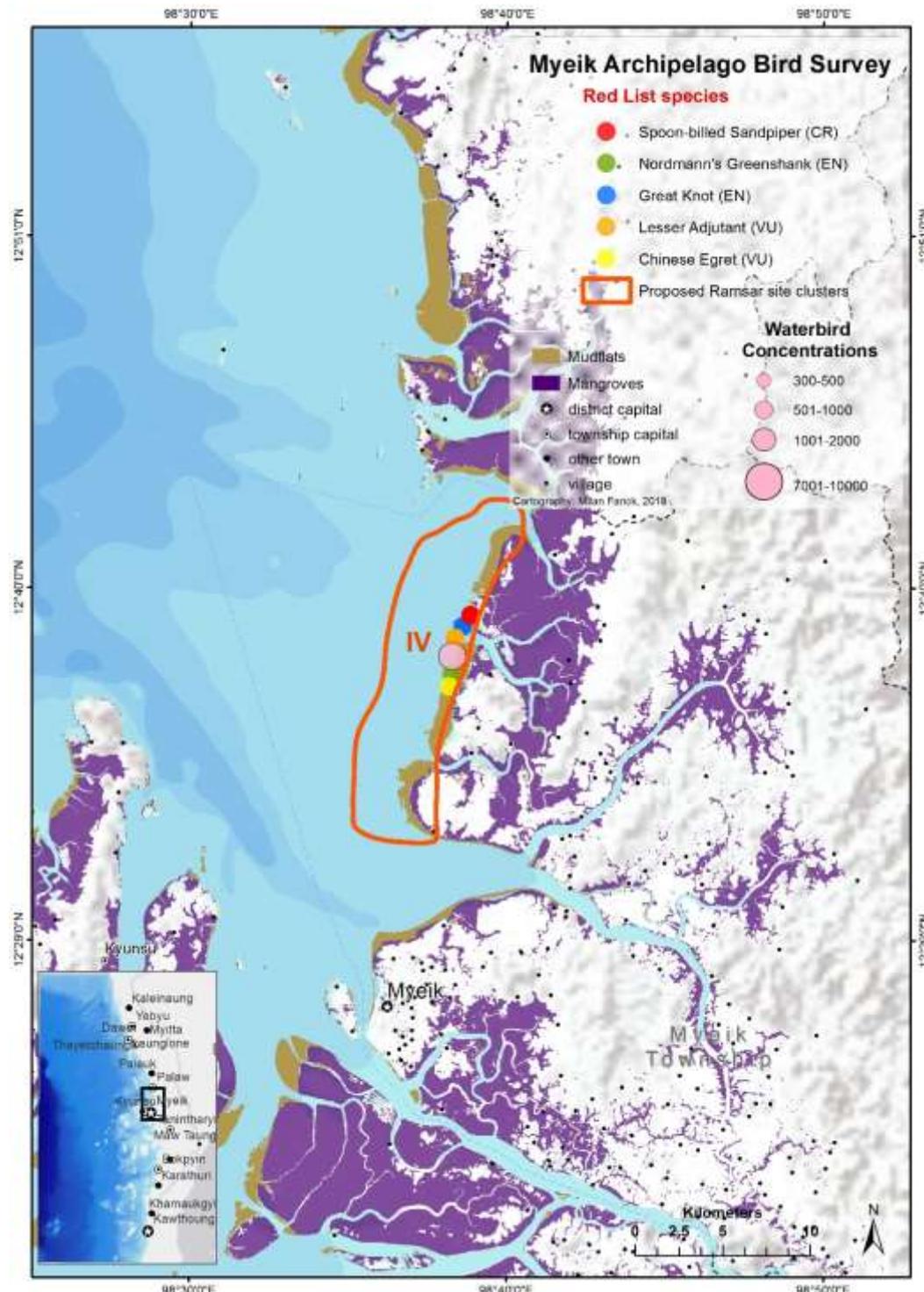


Figure 6: Waterbird concentrations and Red-listed species in the northern Myeik mudflats.

**Table 4: Globally threatened and other waterbirds with high numbers and other globally threatened species in the Northern Myeik Archipelago with max. number in 2017 compared for some species with 2015 in ( )**

Species	Scientific name	RL - Status	Pop. Estimate 2017 (2015)	KBA criteria	Ramsar 1%
Spoon-billed Sandpiper	<i>Calidris pygmeus</i>	CR	0 (1-2)	A1	
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	14 (6-10)	A1	1.4%
Great Knot	<i>Calidris tenuirostris</i>	EN	192 (150)		
Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>	VU	0 (2-6)		
Chinese Egret	<i>Egretta eulobotes</i>	VU	9		
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	20-30		
Red Knot	<i>Calidris canutus</i>	NT	30-40		
Red-necked Stint	<i>Calidris ruficollis</i>	NT	240 (100)		
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	48 (28)		
Beach Thick-Knee	<i>Esacus neglectus</i>	NT	2-5 pairs		
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	170 (77)		
Black-tailed Godwit	<i>Limosa limosa</i>	NT	0 (3)		
Eurasian Curlew	<i>Numenius arquata</i>	NT	225 (56)		
Grey-tailed Tattler	<i>Heteroscelus brevipes</i>	NT	0 (1)		
Lesser Sand-Plover	<i>Charadrius mongolus</i>		1100		0.9%
Whimbrel	<i>Numenius phaeopus</i>		180 (204)		
Terek Sandpiper	<i>Xenus cinereus</i>		41		
Common Redshank	<i>Tringa totanus</i>		170		
Brown-headed Gull	<i>Chroicocephalus brunnicephalus</i>		500		
Lesser Crested Tern	<i>Thalasseus bengalensis</i>		100		
Pale-capped Pigeon	<i>Columba punicea</i>	VU	7		
Red Breasted Parakeet	<i>Psittacula alexandri</i>	NT	30-50		
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	10		

**Eurasian Curlew *Numenius arquata* (NT)**

A minimum of 2,400 individuals, representing 2.4% of the global flyway population was observed in Kan Maw and Bokpuin mudflats. The mudflats near the town Bokpyin alone supported a flock of 1,900 Eurasian Curlews in Feb 2017 only, making the area around Bokpyin the most important site for the species in Myanmar (see Figure 9). In Nov the numbers were still at around 1,000 birds, but also more smaller flocks scattered more widely along the coast. The former combined total for the entire Gulf of Mottama of 2146 individuals in 2010 (Zöckler et al. 2014) has not been reached in recent years (Pyae Phyo Aung pers. comm.) or anywhere else in SE Asia (Li & Mundkur 2007). The high tide roost just north of Bokpyin might attract Curlews from a large area.



**Eurasian Curlews roosting at High Tide near Bokpyin together with Bar-tailed Godwit, Great Knot and Grey Plovers**

**C. Zöckler**

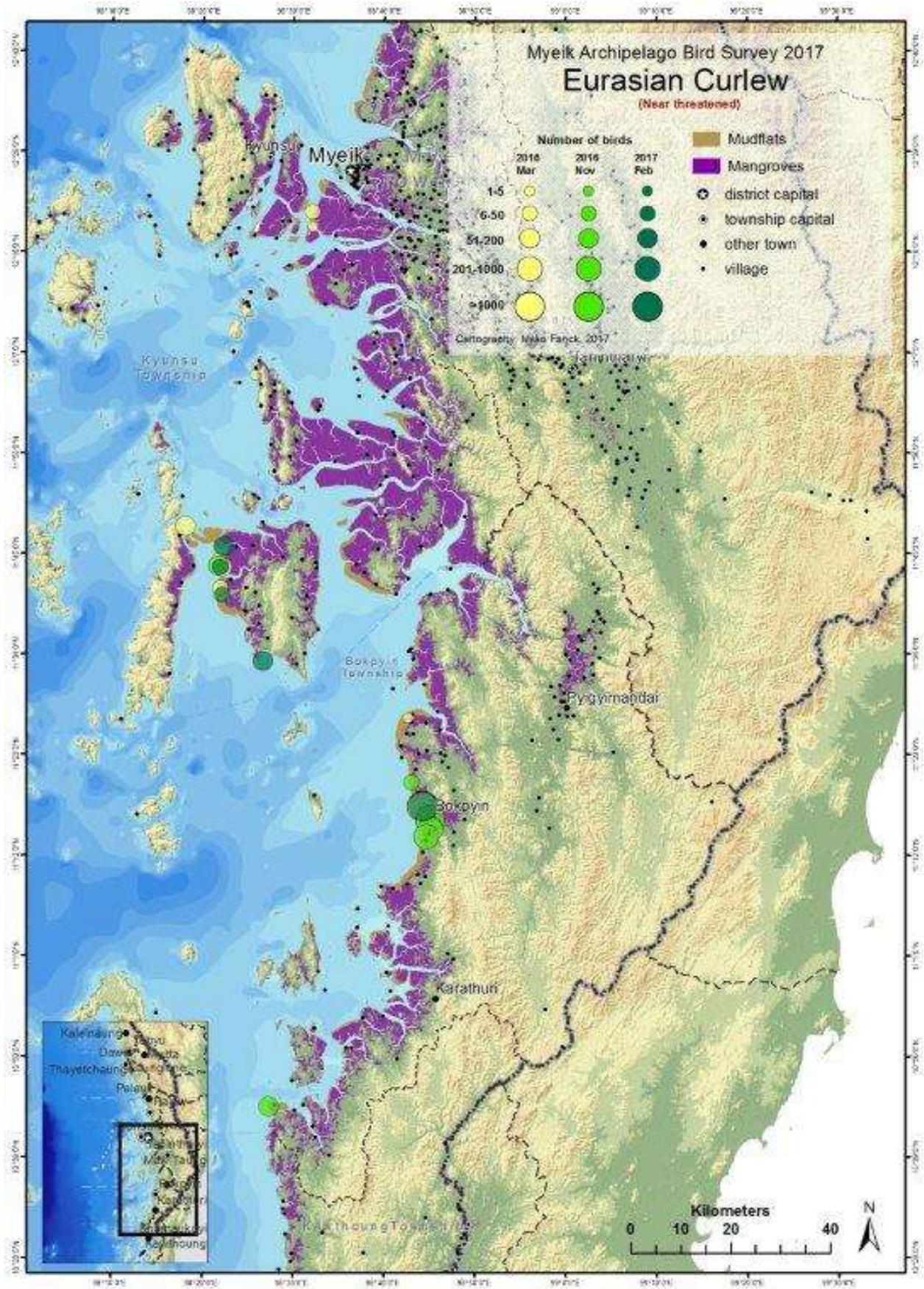


Figure 7: Distribution of Eurasian Curlew in the Myeik Archipelago

### Brown-headed Gull *Larus brunnicephalus*

Among the gulls and terns the Brown-headed Gull is the most common species and the only one that fulfils the 1% Ramsar criteria (see Table 5), represented by over 5400 birds or 3.9 % of the flyway population (see also Table 5 and Fig. 8). These are by far the highest numbers recorded for this species in Myanmar. Similar numbers of 2,800 were recorded in the Eastern Ayeyarwaddy Delta (Zöckler et al. 2014) but hardly nowhere else in SE Asia, apart from the Inner Gulf of Thailand where over 8,000 birds were observed in the early 2000s (Round 2006). These high numbers from March 2016 and Nov 2016 combined resulted in an overall maximum of 5400 individual gulls. The Myeik Archipelago belongs to one of the most important wintering sites for the species.

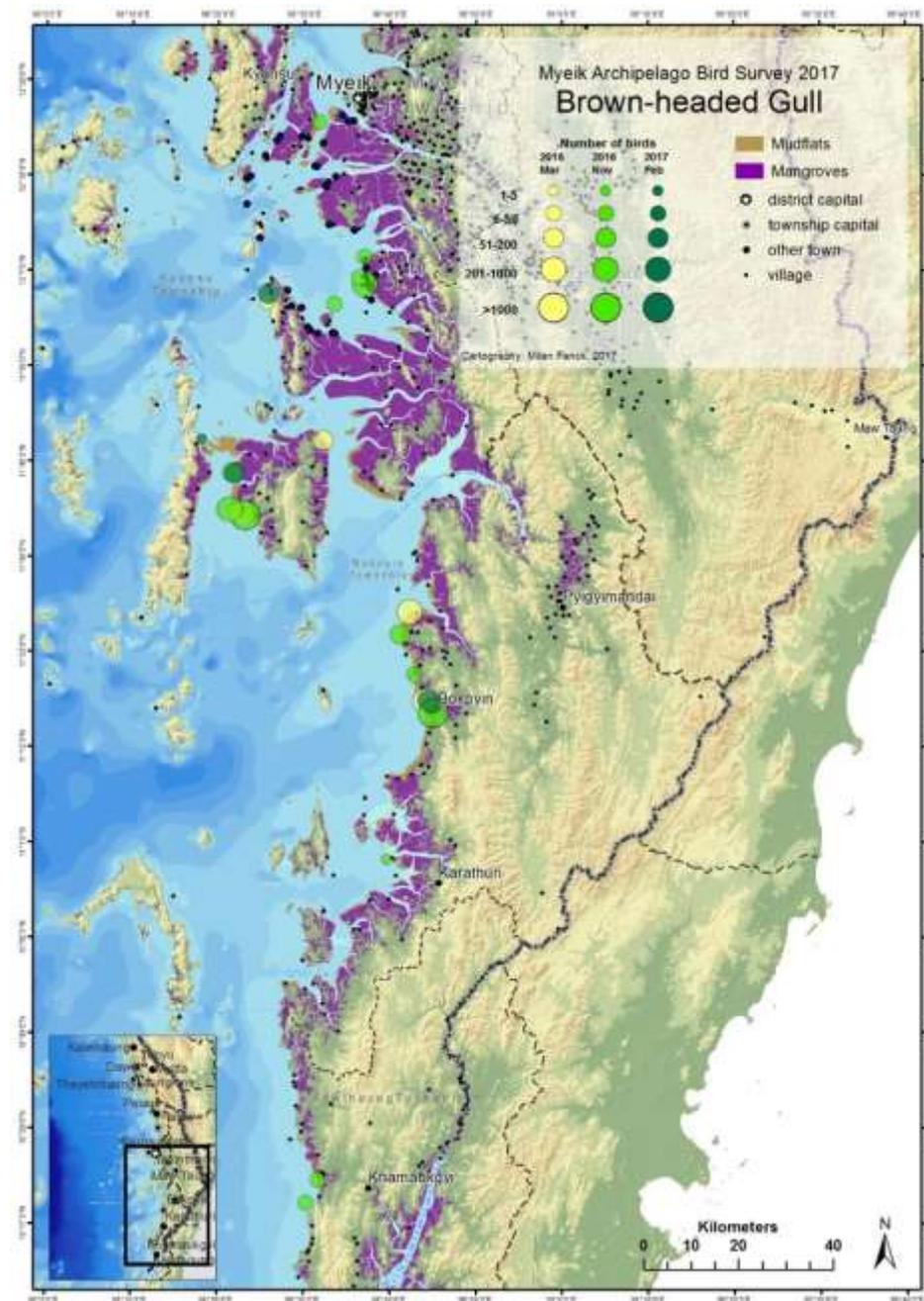


Figure 8: Distribution of Brown-headed Gull *Larus brunnicephalus* in the Myeik Archipelago in 2017

## Threats to Birds and its habitats

### *Development*

The biggest potential threat to the area is coastal development. The Myeik Archipelago is close to the regional hub and city Myeik, which is economically booming. The city is expanding and encroaching more and more into the mangrove forest area. Many pristine mangrove areas have been converted already and become degraded. Also the southern town of Bokpyin is likely to expand, threatening potentially valuable intertidal mud and sandflats as well as mangroves north of the town. Although no immediate plans are known, it is important to secure long-term protection for the valuable and important sites recognised through the surveys.



**Housing and hotel development in mangrove areas north of Myeik**

Without any official protection the adjacent areas of the town of Myeik are subjected to further development. Further development is planned and could threaten the integrity of important coastal habitats.

But it is of course not only the development of cities and towns that threaten the remaining mangroves. More and more new villagers appear accelerating the deforestation (see chapter below).

However, plans for aquaculture are developed and partly supported by European aid agencies. These could be potentially detrimental to the conservation goals identified. Further inquiries and

collaboration is required. The special threats to mangroves has been mentioned and listed in previous reports (e.g. Zöckler et al. 2017) and is not mentioned again.

## **Hunting**

Little is known about the hunting pressure in the region but the few interviews undertaken revealed a similar picture that is well known along the entire coast of Myanmar. Whenever there are flocks of waterbirds, larger than 1000 individuals, bird hunters are setting up their traps as revealed from the village of Kanbijn in the northern part of the area. In the bird rich southern areas, near Bokpyin little hunting is taking place according to the local communities.

## **Hunting survey and mitigation measures**

At the same time it deemed necessary to address the hunting issue in the most northern villages where hunters have been known in the communities. Little and sporadic hunting also occurs in the southern mudflats near Bokpyin, attracted mainly by the regularly roosting 2,000 Curlews. They appeared not to know about the Spoon-billed sandpiper and target primarily larger shorebirds, such as Curlews, Whimbrel and godwits. Further exploration is required to establish the level of hunting across the survey area. Close collaboration with the communities is essential, when undertaking socio-economic surveys and using the experiences gained in the Gulf of Mottama and other places along the coast of Myanmar mitigation measure should immediately be implemented.

In the Bokpyin area bird hunting has been reported but the scale and impact was not known. Interviews in the Nipa and other villages namely within the Peshu minority community were conducted among local villagers. Among the 20 people interviewed one admitted to irregular hunting of mainly Curlews, mostly in early spring. After explaining the threat posed to waterbirds and especially globally threatened or near-threatened birds by BANCA the villagers agreed to cease bird hunting in the region. No further measures were considered necessary but the follow up visit in January was meant to check on the promises but also foster the new relationship with the villagers. BANCA also donated a second hand binoculars to encourage guarding and patrolling the birds.



Pyae Phyo Aung inspecting net for bird trapping and discussing with local villagers about water bird conservation Nipa village near Bokpyin Nov 2017 CZ

### ***Plastic***

The amount of plastic is staggering and still seems to increase relentlessly. Very few efforts seem to be taken up to address this issue, but local people need to start dealing with it by themselves first, before meaningful assistance can be provided. Together with natural debris it is floating in coastal waters and washed along the shore of smaller islands (see photo above). Its origin is mostly domestic but also some contribution from foreign sources. We observed several times how villagers assembling rubbish emptied the bins directly into the sea!

### ***Deforestation***

Both, mangroves and sundaic forests are highly threatened by rapidly increasing forest degradation and knock-on effects for the adjacent mudflats. The Sundaic Forest is also cut and burnt for oil, rubber and betel plantations (see figure below).



Most if not all of the visited mangrove forest is allocated as 'Reserved Forest'. However, this does not mean anything for the protection of the forest and its habitats for biodiversity. Logging is the most common and most severe of threats to mangroves in the survey region. Mangroves are cut for char coal and also construction (see photo).



Mangrove cutting by axe near Medaw

Nov 2017

C. Zöckler

## **Conclusions**

### **Conservation Recommendations**

The mudflats and mangroves in southern Inner Myeik Archipelago are one of the most mature and pristine coastal ecosystems left in Myanmar. The intertidal mudflats are of international importance for waterbirds but also a rich food source for local communities. While the mudflats do not seem to be under immediate pressure, the mangroves are vanishing rapidly. The numbers and diversity of bird species is witness to the fact that the mangroves are still in a good shape and host a large variety of species. Yet, urgent action is required to save the remaining intact mangroves of Myanmar! Urgent action is required to halt the rapidly increasing degradation before any conservation efforts will be in vain. A mix of immediate law enforcement, community involvement and income incentives are proposed. The creation of a cluster of Ramsar sites (see Fig. 5 and 6) is proposed and a Man & Biosphere Reserve along national and international protection is required. All of the proposed activities need to be implemented in parallel in close alliance with local NGOs. Additional potential partners and donors can be found in the Future for Mangroves initiatives, which Myanmar recently has joined and also other international aid mechanisms.

When designing any future protected area, either Ramsar site or any other type of reserve, e.g. M&B Reserve (see Figure 9) it is important to also consider the most northern part, north of the northern branch of the Tanintharyi River at Kanbyin beach (see figure 6). Figure 9 shows the proposed overall coastal wetland areas that need urgent protection as they are most important for migratory waders and breeding birds that are globally threatened or near-threatened.

This is a huge area of over 186,000 ha mangroves alone and another 150,000 ha of islands, sundaic forests and intertidal mudflats. These all are important and vital habitats for the ecosystem functions and important for local communities as well as the global community. But the local communities need to live in and with the natural resources and needs to define the sustainable harvest of timber, fish and marine resources available but ultimately limited. A Man & Biosphere Reserve concept not only allows but encourages the sustainable use within defined development and buffer zones while core zone are untouched and reserved for wildlife and recovering natural resources.

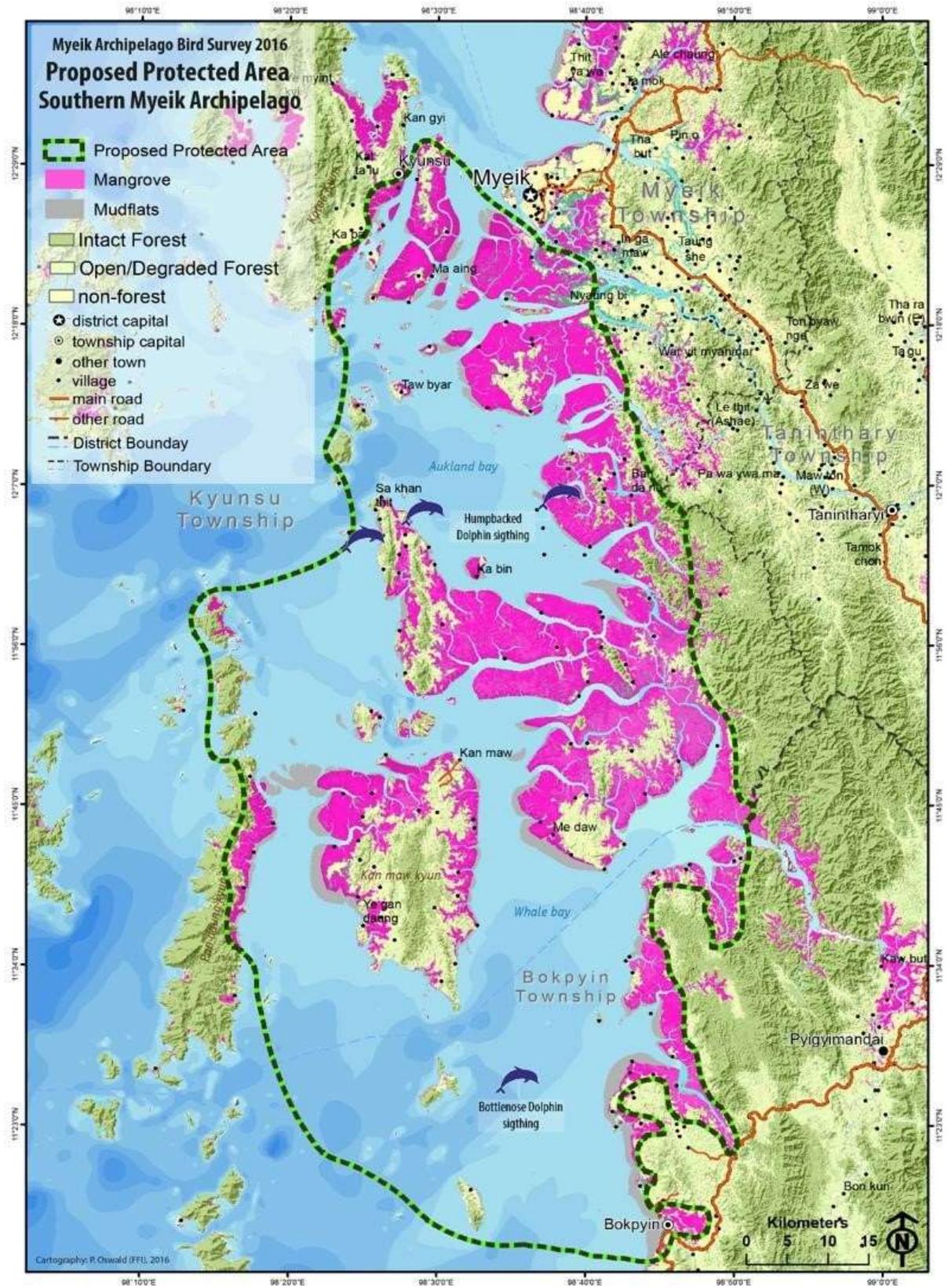


Figure 9: Overall area of high conservation value in need for protection in the southern part of the Myeik mudflats and mangrove areas.

## Importance for migratory and residential birds

The intertidal mudflats create an ecological unity with the adjacent mangroves. Both, mangroves and intertidal mudflats coexist in a complex intertwined relationship side by side, determined by the tidal, sediment and water flow and connected by the intertidal exchange of water, nutrients and species, in particular by several bird species which use both habitats at different stages of the tidal cycle or at different stages in their life cycle.

### **Ramsar site and criteria**

The intertidal mudflats of the survey area are highly productive ecosystems, providing food and staging areas for many different bird species. In total over 24,000 waders, gulls and terns have been recorded in the southern mudflats alone. Adding another maximum of 3000 egrets and herons at least criterion 5 will be fulfilled. High numbers of Whimbrel (over 1,000) Redshank (over 3000) and Terek Sandpiper (over 300) observed in neighbouring Auckland Bay may add to the cluster, but more surveys are needed to confirm the significance of the bay for waterbirds.

The international Ramsar Convention on the protection of wetlands has been signed by almost all nations in the world, including Myanmar, who joined the Convention in 2002. To date Myanmar has designated four sites. Many more sites are qualifying. Several sites in the Taninthary coastal region would also qualify including the areas surveyed around the Myeik archipelago. There are in total nine criteria for a site to fulfil the status of a Ramsar site under the Ramsar Wetland Convention. Of these four relate to waterbirds. Three are met with

- **Criterion 2 Rare species:** in total 8 globally threatened and 20 near threatened species add to criterion 2
- **Criterion 5 20,000 waterbird Threshold:** Table 4 lists over 24,000 waders, gulls and terns. Even without an additional 3000 more egrets and herons this criterion is achieved.
- **Criterion 6 1% waterbird flyway population:** Table 5 summarise those species that fulfil this criteria. In total eight species qualify for this criterion.

The site with its mudflats and mangroves meets these Ramsar criteria many times and it seems to be one of the most urgent sites in Myanmar to be listed under the Wetland Convention. The unique status of largely unaffected mangroves further adds to the value and could further add criterion 1 for unique habitat systems to the site criteria.

**Table 5: Recorded waterbird population in the southern Myeik mangroves and mudflats between March 2016 and Nov 2017 survey periods. Species fulfilling the criterion only with additional observation from previous periods and other sites are marked with \***

Species	Scientific name	RL	Ramsar 1%	Total Nov 16	Total 2016 - 2017
Lesser Adjutant Stork*	<i>Leptoptilos javanicus</i>	VU	1.0*	16	30+
Chinese Egret	<i>Egreta eulophota</i>	VU	1.3	28	65
Whimbrel	<i>Numenius phaeopus</i>		1.9	739	928

Eurasian Curlew	<i>Numenius arquata</i>	NT	2.4	1649	2426
Terek Sandpiper	<i>Xenus cinereus</i>		1.8	366	818
Nordmann' s Greenshank	<i>Tringa guttifer</i>	EN	3.2	-	32
Common Redshank	<i>Tringa totanus</i>		2.9	1110	2948
Brown-headed Gull	<i>Larus brunneicephalus</i>		3.9	3010	5444

The Lesser Adjutant Stork (VU) qualifies for the 1% flyway population criteria together with the numbers recorded in Auckland Bay (Zöckler et al. 2014) with a total of 45-60 birds. Together with additional numbers observed in 2017 the total number of this charismatic stork might be estimated at 60-75 individuals in the southern Myeik region. The newly discovered Chinese Egret was present in at least 28 individuals but estimated at more than the 65 individuals to list that species into the Table 5 of species fulfilling criterion 6 of 1% of the flyway population.



Lesser Adjutant Stork

Nipa Village

Nov 2017

C. Zöckler

## Community based Conservation

Different approaches between communities were observed and some areas, in particular those close to settlements such as Bokpyin were unaffected and seem to be protected by the local communities. Also north of Bokpyin, the Peshu, a Malaysian minority living largely from marine resources has been protecting the mangroves in the region and seems also use its marine resources in a sustainable way. Other communities are less caring and many areas, especially those further afield are targeted for charcoal production and heavily depleted.

The idea of a mangrove festival has already been discussed with various local stakeholders and village leaders in several key villages in the region in Kan Maw and Sakhan Thit and received unanimous support. The level of general support in all visited communities for protecting the mangroves but also for protected areas is large but it is necessary to follow up on these supportive statements and achieve a strong and sustained commitment and leadership among the community leaders. This can be achieved by engaging with these village leaders in serious partnerships, joint events and creating a common joint vision.

The Mangrove Festival that took place in Myeik in November 2016 was a good start but did not address the crucial audience that will make a difference. A follow up event took place in Sakhan Thit and engaged with village leaders and community representatives and village monks and other local celebrities. A more detailed report has been completed separately. Ideally, it should be an annual event, rotating between different villages in the region who invite each other and exchange ideas and spread the messages, creating a gradually establish event that honours and respects the existence of healthy mangroves in the region.

Community based work has already started by FFI in some selected communities in Aukland bay and that is laudable. Different approaches encompassing all necessary communities are required to spread the crucial message of mangrove protection. Joint exchange visits to neighbouring countries for information on sustainable mangrove resource management under the leadership of FFI are very useful and could also be extended to include seeking guidance on developing eco-tourism and a visit to the M&B Reserves in neighbouring mangrove systems in Thailand.



**Local communities depend on healthy marine and coastal ecosystems and will support the protection**



**Brachiopod *Lingula angina* has been harvested for consumption by local people in Nipa mudflats**

### **Monitoring**

Further regular bird surveys are recommended in the areas identified as significant for Ramsar and also in the Auckland Bay, where no surveys have been taken since Dec 2013. It would also be good to survey at different seasons, namely in the breeding season to establish the breeding status of some resident species and will help determine the boundaries of future protected areas. The impact of the ongoing degradation of the mangroves on the bird communities must also be monitored and mitigation measures taken in place. Although the impact of hunting is minimal future monitoring especially on curlews will be useful in assessing any success.

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