

Tanintharyi Conservation Programme (TCP)



THE BIRD FAUNA OF THE SOUTHERN MYEIK COAST

REPORT ON HISTORIC AND NEW SURVEYS IN THE TANINTHARYI COAST OF SOUTHERN MYANMAR

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III) EXECUTIVE SUMMARY

From 3-17 March 2016 a bird and mangrove survey of the Southern Myeik Archipelago and one day north of Myeik found a total of 174 different bird species and assessed the level of degradation of the mangroves. **Common Gull** and **Aleutian Tern** were recorded for the first time in Tanintharyi Region and possibly in Myanmar. Also the **Copper-throated Sunbird** has possibly been recorded in Myanmar for the first time, although there may be unpublished older records. Among the bird species observed during the survey are **five globally threatened species**, including three waterbirds and two migratory waders breeding in Russia. There were also eleven globally near-threatened species, including five migratory waders from Russia, China and Alaska, but also five local resident birds living and nesting in the mangroves of the region. Five waterbird species have been recorded in numbers of 1% or more of the flyway population fulfilling at least one criterion of the survey area for a wetland of international significance under the **Ramsar Convention**. Two globally near-threatened key mangrove bird species, the **Mangrove Pitta** and the **Brown-winged Kingfisher** have been recorded in exceptionally high densities. Extrapolated across the entire mangrove areas an estimated 5,000 territories of Mangrove Pittas and 2,400 territories of Brown-winged Kingfisher may be present in these mangroves highlighting their huge importance for Myanmar and beyond. Together with the range-restricted and globally threatened **Plain-pouched Hornbill** and the **Lesser Adjutant Stork**, these two range restricted mangrove species may well qualify the mangroves and mudflats of the survey area as a Key Biodiversity Area (KBA). However, a newly developed rapid assessment tool describes most of the mangroves as **negatively affected by human activities**. In the

course of the survey we also established that logging and the degradation of the mangroves is a relatively new development but **rapidly increasing**. Urgent conservation actions are required. A protected area is proposed and a Mangrove Festival is suggested as an important, immediate event to raise awareness of the importance and plight of the area's **globally important mangroves**.

1. INTRODUCTION

1.1 Background

Myanmar's coast is still home to largely pristine mangroves and huge mudflat areas that potentially hosts important bird diversity and serve as roosting and feeding area for migratory waterbirds. In March 2016 Fauna and Flora International (FFI) initiated further surveys of mangroves and mudflats in the southern Myeik Archipelago. A particular focus has been on coastal habitats, especially intertidal mudflats and mangroves, but also on near coastal forest habitats on higher elevations or inland island habitats

In December 2013 the expedition by boat covered large part of the northern archipelago north of Lampi Island. Whereas Lampi Island and surroundings have been relatively well studied little information is available from the northern part of the archipelago around Myeik, south of Myeik as far as Bokepyin and beyond. There have been only a few previous expeditions over the past 20 years and very little work has been carried out on the birds of the entire Tanintharyi Division and hardly anything of the Northern part of the Myeik archipelago, especially in recent years.

Scott (1989) lists the Myeik Archipelago in his Directory of Asian Wetlands but does not provide specifics and refers largely to Smythies (1940). Most of these references have very little specific data on bird species included. Inskipp et al. (2003) provided an annotated checklist of birds seen during a field trip in the Archipelago, but they visited the outer islands and not the mangroves of Aukland and Whale Bay. Finally, NCNPP, Burma (1982, 1983) mention a few birds noted during brief surveys to a number of islands and mainland areas in Tanintharyi. Inskipp & Inskipp (2003) provided an annotated bird and mammal species list including the Myeik archipelago but only small parts overlap with the survey area.

Special emphasis in this report is given to Mangroves and Waterbirds. In particular, migratory waders or shorebirds that utilise intertidal mudflats and mangroves in the area feature in this report. Previous results of the December 2013 survey have been summarised and included in an overview of coastal habitats for waterbirds in Myanmar (Zöckler et al. 2014), but the more southern areas in Whale Bay, near Bokepyin and around Kan Maw Island had not been visited before and were not included in that overview. The region has one of the most pristine and extensive mangroves areas and a diverse mangrove avifauna. The mangrove areas in particular are under serious pressure, and none of the surveyed habitat is protected on the ground. The authors hope that this report provides sufficient data to promote the future protection of the area through appropriate conservation measures.

1.2 Bird survey methods

From 3-17 March 2016 an expedition on behalf of FFI surveyed previously unknown mudflats and mangroves in the southern Myeik Archipelago for birds, and investigated the state of mangrove degradation. The survey was organised by FFI Tanintharyi Programme, conducted by Dr Christoph Zöckler and assisted by Ren Nou Soe and Shane Thu Lwin. On 3 March a boat excursion revisited sites in Auckland Bay that were surveyed by the author in December 2013 (Moses & Zöckler 2015). On March 4th an additional opportunity arose to check selected mangroves and mudflats north of Myeik at Thetyewar Beach by motorbike; this is an area that was not surveyed during the November 2014 and May 2015 trips (see also table 1). This report however focuses mainly on the areas visited between 5-17 March south of Auckland Bay. The expedition results are summarised and the status and threats for birds and their habitats is assessed. Some recommendations are made.

It proved difficult to arrange a suitable boat for the survey from Myeik, as most boats based here are ocean-going. However, in Sakkhan Thit village on the island of the same name we were able to arrange a new, smaller boat with an experienced local driver, Mr Muil Lwin. This boat was used for the remaining ten days of surveying the mangrove and mudflat areas, and proved extremely well suited for negotiating the shallow waters in the mangrove channels, while also being able to access shallow mudflat areas and approach roost sites at high tide.

Table 1: Itinerary of the Myeik coastal bird survey

Date	Means of Transport	Location
03-Mar-16	Small boat	Kyunsu Peninsula
04-Mar-16	Motorbike	Thetyewar Beach (North Archipelago)
05-Mar-16	Large boat	Sakkan Thit
06-Mar-16	Motorbike	Sakkan Thit inland
07-Mar-16	Small boat (hired at Sakhan Thit)	Sakkan Thit coast
08-Mar-16	Small boat	Sakkan Thit and Me Daw Peninsula
09-Mar-16	Small boat	Kan Maw East
10-Mar-16	Small boat	North of Yay Ngan Gyi
11-Mar-16	Small boat	Yay Ngan Gyi
12-Mar-16	Small boat	Yay Ngan Gyi and Bokpyin
13-Mar-16	Small boat	Bokpyin and open sea, camp at Ye Gan Daung
14-Mar-16	Motorbike	Kan Maw island
15-Mar-16	Small boat	Kan Maw West
16-Mar-16	Small boat	Pan Htaung and islands north
17-Mar-16	Ferry to Myeik	Sakkan Thit -Myeik

Figure 1: Survey boat in the sandflats near Bokpyin © C Zockler/ FFI (2016)



Bird records include sightings as well as sound records and in very few cases other signs (footprints, feathers, corpses). Binoculars (8x40 and 10x40) as well as three zoom telescopes (15-45x60) were used in addition to sound recordings with Telinga Parabolic microphones 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). Selected bird recordings were also tagged with GPS coordinates (see figures 2-10).

1.3 Mangrove rapid assessment method




All mangrove areas visited in the Myeik coastal zone have been impacted by human activity in one way or another. The impact varies from almost clear cut (though this was not observed within the current survey area), to selective extraction of a limited number of selected trees. In order to assess the degradation of the mangroves, an assessment methodology has been devised that can be applied during a rapid assessment across large mangrove areas from land and/or boat.



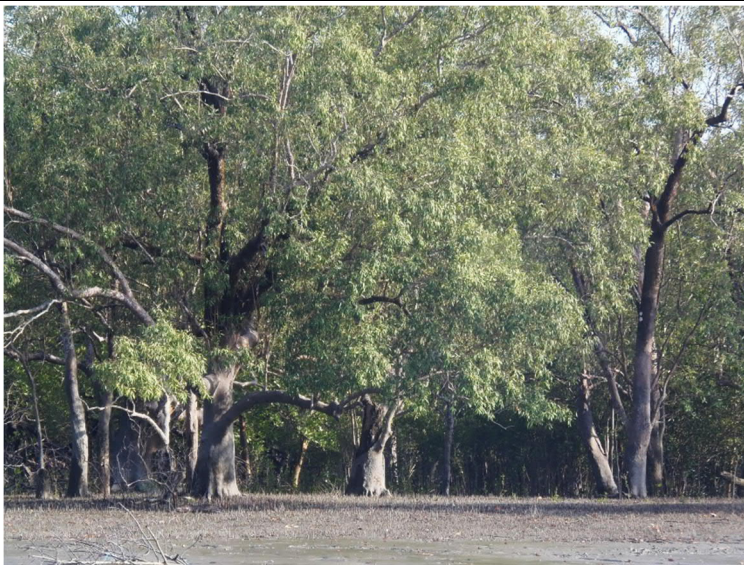
The assessment allows surveyors to describe the level of destruction and the present observed state of impact of a mangrove, which is often different to that which can be observed from satellite imagery only. The method uses a scale from 1 (most impacted: ie, clear-cut) to 6 (not impacted, ecologically intact)(see Table 2).

Even though the assessment often is based from a boat passing the coast or from within the channel, the state of the mangroves can be assessed up to 500 meters deep or further when access long channels is available, and rarely do the height or density of mangroves change significantly with distance from the shore. However, there were a few exceptions where the slightly elevated interior of some islands allowed a longer view inland.

The observed mangrove areas along the Southern Myeik coast varied from 3: quite impacted (only small scattered trees left) to 5-6 (almost intact, with large and mature trees remaining but some impact from cutting visible), plus all intermediate ranks (see Figure 7).

Table 2: Scale used to assess mangrove degradation, from 1 (None) to 6 (Cleared)*

Rank	Description	Photo
1	<p>Hardly any mangroves are left. Only stems of former mangroves are visible</p>	
2	<p>Mangrove has been clear cut, Shape: low bushes, former stumps and roots still visible Height: ~1 meter in height</p>	
3	<p>Shape: Small forest Height varies between ~2 and 5 meters, but vegetation is dense and bushy with very few larger trees in diameter of 20 cm or more.</p>	

<p>4</p>	<p>Shape: Mangrove clearly in the shape of forest with gaps in between few larger trees of Diameter: 20cm and larger. Height: > 6-12 meter. Logging: All or most large trees logged</p>	
<p>5</p>	<p>Shape: Tall Forest with large trees in open mudflat areas, Height >12 m Diameter: up to 1meter Logging: Single and few logged trees</p>	
<p>6</p>	<p>Shape: Tall Forest with trees in open mudflat areas, spread out widely in between trees Similar to 5 but no cutting and no signs of logging at all</p>	

All images © C Zockler/FFI (2016)

* This scheme is still in development and evolved further during visits of mangroves in the Taninthary region and might be suitable for a finer scale from 1-12?

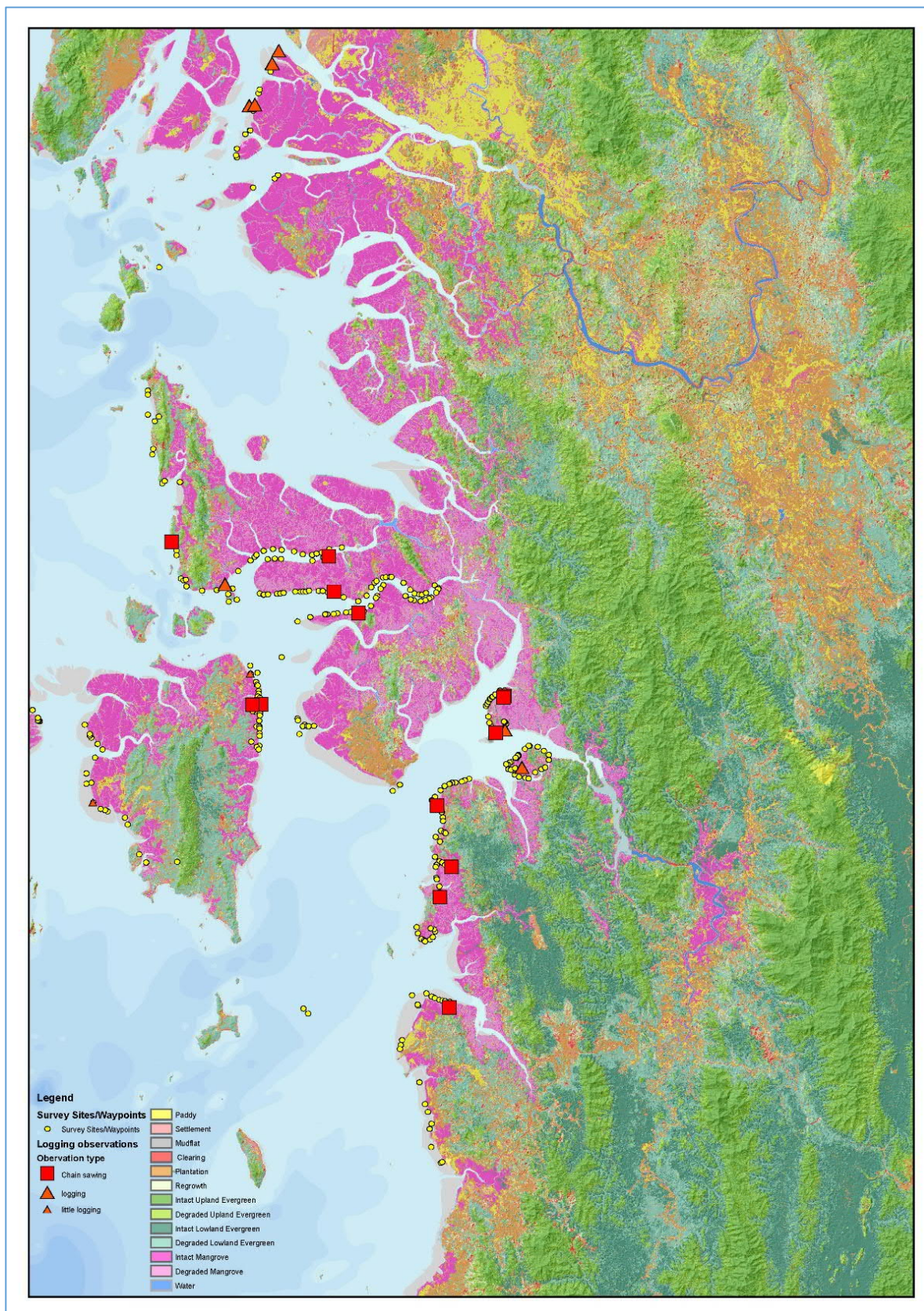


Figure 1: Survey Area in the Southern Myeik Archipelago. Yellow dots describe the survey route © FFI 2016 © C Zockler/FFI (2016)

2. RESULTS

2.1 Overview

A total of 174 bird species were recorded during the survey period (see annex 1). Several of these species were observed in the area for the first time, but there have been only very few previous surveys and little is still known about the distribution and abundance of birds in the region. Two species, **Mew Gull** *Larus canus* and **Aleutian Tern** *Sterna aleutica* were to the author's knowledge new records for Tanintharyi Region, perhaps even Myanmar. The **Asian Dowitcher** *Limnodromus semipalmatus* has been recorded previously only as single birds. For the first time a wintering site of more than 20 birds of this globally near-threatened species has been found in Myanmar. Also, the **Copper-throated Sunbird** has here possibly been recorded in Myanmar for the first time. A typical mangrove species, this sunbird was recorded four times (Figure 7), but is not published from Myanmar.

2.2 Globally threatened Species

A total of five globally threatened (CR, EN, VU) and ten near-threatened species (NT) were recorded, highlighting the significance of the area. Of the eight globally threatened waterbirds two are endangered (EN: **Nordmann's Greenshank** and **Great Knot**) (see also table 3, figure 3 and Annex 1). The distribution of the observations of all five globally threatened species are displayed in Figure 2 (forest birds) and Figure 3 (waterbirds).

In addition, another 11 near-threatened species were recorded (see Annex 1). Of these, six species are strongly associated with intertidal mudflats (**Black-headed Ibis**, **Black-tailed Godwit** and **Eurasian Curlew**, **Asian Dowitcher**, **Curlew Sandpiper** and **Red-necked Stint**), and five species depend on or at least favour mangrove habitats (**Black-headed Ibis**, **Red-breasted Parakeet**, **Brown-winged Kingfisher**, **Mangrove Pitta** and **Fiery Minivet**). All of the latter four species were recorded in large numbers and were widespread across the survey area.

Table 3: Abundance of Red Listed Bird Species in the survey area of the Myeik Archipelago in March 2016 compared with December 2013 and 2014 (different parts of the survey area. No. of breeding pairs, estimated for two mangrove species, Brown-winged Kingfisher and Mangrove Pitta, based on average abundance per 100 ha, [sample size of 100 ha plots]

Common name	Scientific name	Status	Max. in 2013-2014	Mar 2016	Pairs/ 100ha of mangroves	Est. total
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	5	3		>5
Great Knot	<i>Calidris tenuirostris</i>	EN	-	840		>1000
Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>	VU	19	22		45-60
Plain-pouched Hornbill	<i>Aceros subruficollis</i>	VU	199	9		>200
Great Slaty Woodpecker	<i>Mulleripicus pulverlintus</i>	VU	8	3		
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	10	18		
Red-breasted Parakeet	<i>Psittacula alexandri</i>	NT	1			
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	113	35	1.3 [27]	(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	2.7[28]	(5050)
Eurasian Curlew	<i>Numenius acquata</i>	NT		1650		2000
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	20	230		500
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT	-	25		100
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT		20		40
Red-necked Stint	<i>Calidris ruficollis</i>	NT		30		50

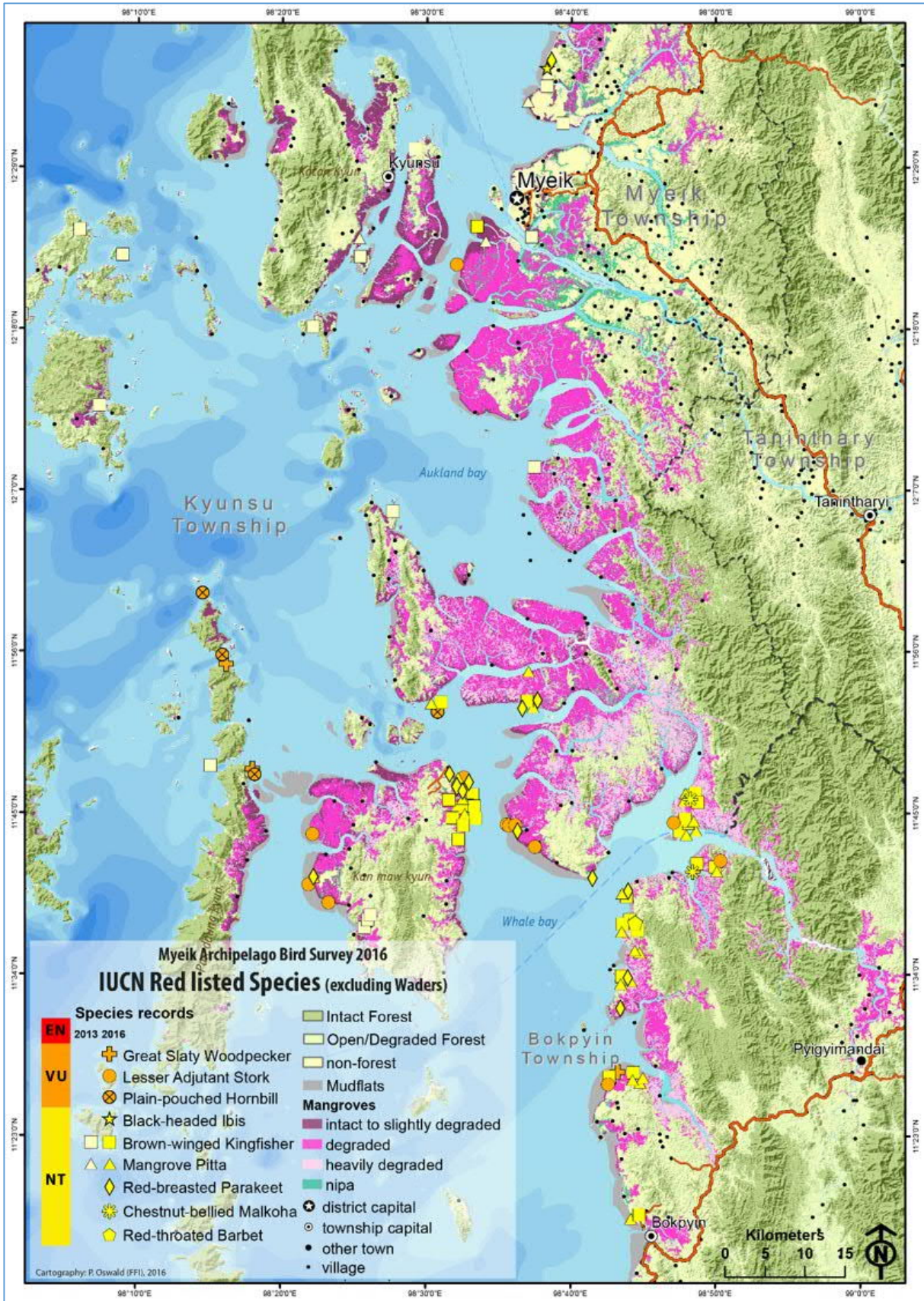


Figure 2: Globally threatened Species in Mangrove and other forest types in the entire Southern Myeik Archipelago © C Zockler/FFI (2016)

Nordmann's Greenshank *Tringa guttifer* (EN)

On 4 March there were at least three birds at Thetyewar Beach north of Myeik (Figure 3). These observations confirm the site as a regular wintering site for the species. Following the Ayeyarwaddy delta the Myeik Archipelago seems to be an equally important wintering site in Myanmar for the species as the Gulf of Mottama (Zöckler et al. 2014). No Nordmann's Greenshank have been observed further south in the Myeik mudflats

Great Knot *Calidris tenuirostris* (EN)

Great Knot at Thetyewar Beach in November 2014 © C Zockler/ FFI 2016

Uplisted to globally endangered (EN) in 2015 (BirdLife International 2016) the Great Knot has undergone serious declines due to habitat loss in their prime stop over and moulting sites in the Yellow Sea (e.g. Moores et al. 2008, 2016). With two separate flocks of 700 and 150 respectively in the mudflats west of Kan Maw (see Figure 3) the species is more common in the Myeik mudflats than previously thought and anywhere else in Myanmar (Table 4). These sites are in addition to previously observed 120 and 95 birds respectively north of Myeik in 2013 and 2014 and the Myeik intertidal mudflats might indeed host over a thousand birds and are the most important wintering site in Myanmar alongside the Ayeyarwaddy Delta (Zöckler et al. 2014) and does match more closely the largest midwinter count of over 1400 Great Knot in the Inner Gulf of neighbouring Thailand (Round 2006).

Lesser Adjutant Stork *Leptoptilos javanicus* (VU)

The Lesser Adjutant Stork is globally listed as vulnerable threatened (VU). At least 22 different birds of this globally threatened Stork have been observed during the survey period. Figure 5 shows the distribution at ten different sites, where the species has been observed with up to three individuals at the same location. It is quite likely that there are many more

birds living in the vast mangrove areas and several more birds may have been unnoticed. Together with 19 birds previously observed in areas further north in Auckland bay and north of Myeik, the entire mangroves of the archipelago are hosting likely between 45-60 birds. With this figure representing 1% of the flyway population or more the area qualifies as Ramsar site and also as key biodiversity area (KBA). The presence of this bird in such big numbers is a reflection of the high quality of the mangrove forest and rather unique for this country (Zöckler et al 2014) and possibly one of the most important sites outside the famous breeding colony in Prek Toal in Cambodia in its entire breeding range (Li & Mundkur 2007). Although there is no proof of breeding at present it is quite likely that the birds might breed in the area in larger numbers. Summer and rainy season observations are required to confirm breeding of this species.



Lesser Adjutant near Maw De Peninsula March 2016 © C Zockler/FFI (2016)

Waders (shorebirds), Gulls and Terns (*Larolimicolae*)

Waders or shorebirds are particularly important for coastal habitats and point to a healthy ecosystem. Therefore they received special attention in this report. Among the total of 174 species recorded during this survey the shorebird or wader and gull and tern species are numerous with 30 species, totalling around 9,800 individuals. Of these are six globally threatened species but also other East Asian migrants that winter regularly in the Myeik archipelago in large numbers. Table 4 summarises 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 4: Distribution and abundance of shorebirds, gulls and terns (*Larolimicolae*) in the Southern Myeik Archipelago; site names see Map 1; Migrant Status: R=resident, A=Arctic, HA=High Arctic, T=Temperate, B= Boreal,

Species	Scientific name	RL	Ramsar 1%	Total	Kyunsu isthmus	Sakhan Thit	Me daw*	Kan Maw East	Yay Ngan Gyi	Bokpyin	Kan Maw West	Migrant Status
Pacific Golden Plover	<i>Pluvialis fulva</i>			170						20	150	A
Grey Plover	<i>Pluvialis squatarola</i>			75					25		50	HA
Red-wattled Lapwing	<i>Vanellus indicus</i>			2						2		R
Little Ringed Plover	<i>Charadrius dubius</i>			5						5		RT
Kentish Plover	<i>Charadrius alexandrinus</i>			445	15			185	75	100	60	T
Lesser Sand-Plover	<i>Charadrius mongolus</i>			630	50	120		20	20	300	120	TA
Greater Sand-Plover	<i>Charadrius leschenaultii</i>			25	4					1	20	T
Bar-tailed Godwit	<i>Limosa lapponica</i>	NT		230	18				90	2	120	A
Whimbrel	<i>Numenius phaeopus</i>		1.4	739	22	55		62	170	200	200	AB
Eurasian Curlew	<i>Numenius arquata</i>	NT	1.6	1649	24	1			4	1400	220	T
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	NT		25					20		5	T
Terek Sandpiper	<i>Xenus cinereus</i>		0.8	366	60	1		1	220	34	50	AT
Common Sandpiper	<i>Actitis hypoleucos</i>			29	2	9	1		6	3	15	T
Common Greenshank	<i>Tringa nebularia</i>			22					7	10	5	B
Common Redshank	<i>Tringa totanus</i>		1.1	1110	320	90	1	82	130	85	300	T
Great Knot	<i>Calidris tenuirostris</i>	EN		850						1	850	TA
Little Stint	<i>Calidris minuta</i>			1				1				A
Red-necked Stint	<i>Calidris ruficollis</i>	NT		28					2	25	1	A
Curlew Sandpiper	<i>Calidris ferruginea</i>	NT		17					16	2	1	A
Broad-billed Sandpiper	<i>Limicola falcinellus</i>			20						20		AB
Ruddy Turnstone	<i>Arenaria interpres</i>			12					12			HA
Brown-headed Gull	<i>Larus brunneicephalus</i>		2.1	3010		40	480	170	220	1000	1000	T
Mew Gull	<i>Larus canus</i>			1						1		
Gull-billed Tern	<i>Gelochelidon nilotica</i>		0.6	288					88	120	80	T
Lesser Crested Tern	<i>Sterna bengalensis</i>			21		1				20		T
Greater Crested Tern	<i>Sterna bergii</i>			20						5	15	T
Aleutian Tern	<i>Sterna aleutica</i>			4							4	AB
Little Tern	<i>Sternula albifrons</i>			6							6	T
White-winged Tern	<i>Chlidonias leucopterus</i>			1							1	T
Total				9801								

*Me Daw mudflats were not accessible and could only be surveyed from very far. Many more shorebirds might be there

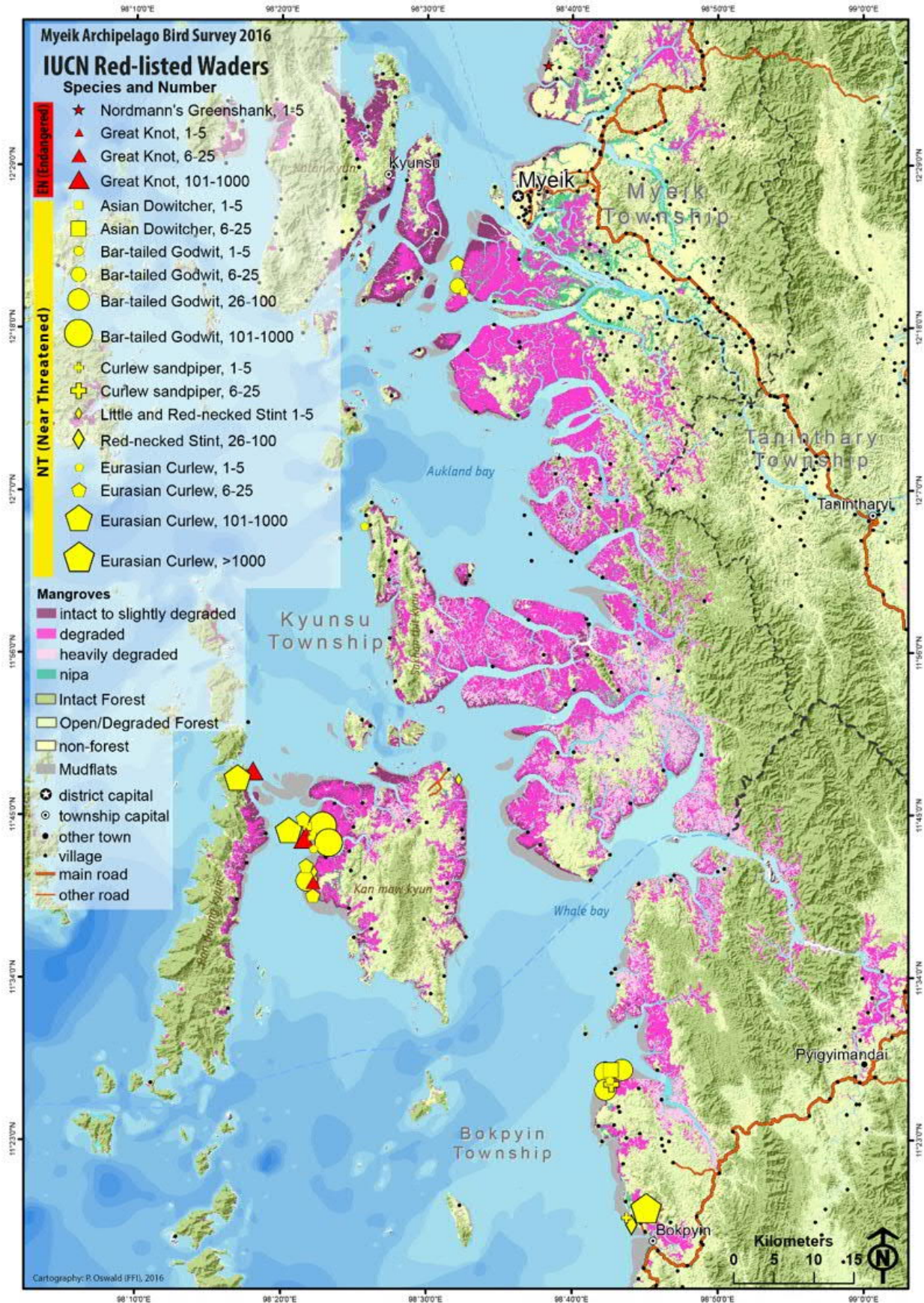


Figure 3: Globally threatened wader species on intertidal mudflat habitats in the Southern Myeik Archipelago area around Myeik © C Zockler/FFI (2016)

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

Bar-tailed Godwit *Limosa lapponica* (NT)

A total of 230 individuals have been recorded. Even though this is not close to represent 1% of the flyway population, it equals the largest number wintering in Myanmar in the Gulf of Mottama (Zöckler et al 2014). The birds observed in the Myeik Archipelago belong most likely all to the Siberian population breeding in North Yakutia and Chukotka (*L.l. menzbieri*). The N and W Alaska breeding population (*L.l. baueri*) has not been observed but could have easily been overlooked as showing quite similar features to *menzbieri*.

Eurasian Curlew *Numenius arquata* (NT)

A total of 1,645 individuals represent 1.6% of the global flyway population. The mudflats near the town Bokpyin supported 1,400 Eurasian Curlews only, making the area around Bokpyin the most important site in Myanmar for the species (see Figure 3). The former combined total for the entire Gulf of Mottama of 2,146 individuals (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, but it could be likely that many more Curlews are roosting further south and future surveys are necessary.



Eurasian Curlews roosting at High Tide on Rocky shore near Pan Htaung Island together with Great Knot and Grey Plovers © C Zockler/FFI (2016)

Asian Dowitcher *Limnodromus semipalmatus* (NT)

A total of 25 individuals in two flocks of 20 and 5 birds each were observed roosting in mangroves and on fishing racks in Yay Ngan Gyi and West Kan Maw (Figure 3). This is the first time that more than one individual of this globally near-threatened bird has been observed in Myanmar (Zöckler et al 2014). Again, the number could be higher as only a part of the mudflats have been surveyed. The Asian Dowitcher is breeding in the steppe region of Mongolia, China and southern Siberia and suffered strong declines in recent years (Wetlands International 2012). The presence of Asian Dowitcher in the surveyed mudflats and in Myanmar is not that surprising considering the presence of up to 600 birds in neighbouring Inner Gulf of Thailand (Round 2005), but confirming the importance of the mudflats for migratory waterbirds.

Terek Sandpiper *Xenus cinereus*

A total of 366 represents 0.8% of the flyway population. However, previously observed flocks in Aukland Bay and other not yet surveyed mudflat areas would easily add to the recorded number and might all in all push the total for this species over the 1-% threshold qualifying for the Ramsar justification of these mudflats. This number is the highest for Myanmar so far recorded surpassing maxima observed in Gulf of Mottama and Ayeyarwaddy Delta (Zöckler et al. 2014).

Common Redshank *Tringa totanus*

More than 1,100 Common Redshanks were observed in the mudflats. The species is the most widely distributed wader in the survey area and very difficult to survey. It is quite likely that an equal number or more of Redshanks have been overlooked. The species is not aggregating in large flocks at few sites but rather distributed widely and roosting scattered in smaller flocks, often well camouflaged in the mangroves. However, the number already surpasses the 1% threshold of the flyway population of the Ramsar criteria.

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, represented by at least 3,000 birds or 2.1 % of the flyway population (see Figure 4). These are the highest number 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 older records of the Inner Gulf of Thailand where over 8,000 birds were observed in the early 2000s (Li & Mundkur 2007).

Common Gull *Larus canus*

One individual was spotted by Ren Nou Soe among over 1,000 Brown-headed Gulls on 12 March 2016 (see Figure 7) and probably constitutes the first record for Tanintharyi and second for Myanmar.

Gull-billed Tern *Gelochelidon nilotica*

A total of 288 (see also Figure 4) is the highest number recorded in Myanmar to date (Zöckler et al. 2014) and possibly in the wider region in SE Asia (Li & Mundkur 2007). Yet this figure still only represents 0.6% of the flyway population. But future surveys could add easily more birds to the wintering population and numbers might qualify for the species to fulfil the Ramsar criteria. The species has been declining but recent estimates and trends are not available (Wetlands International 2012).

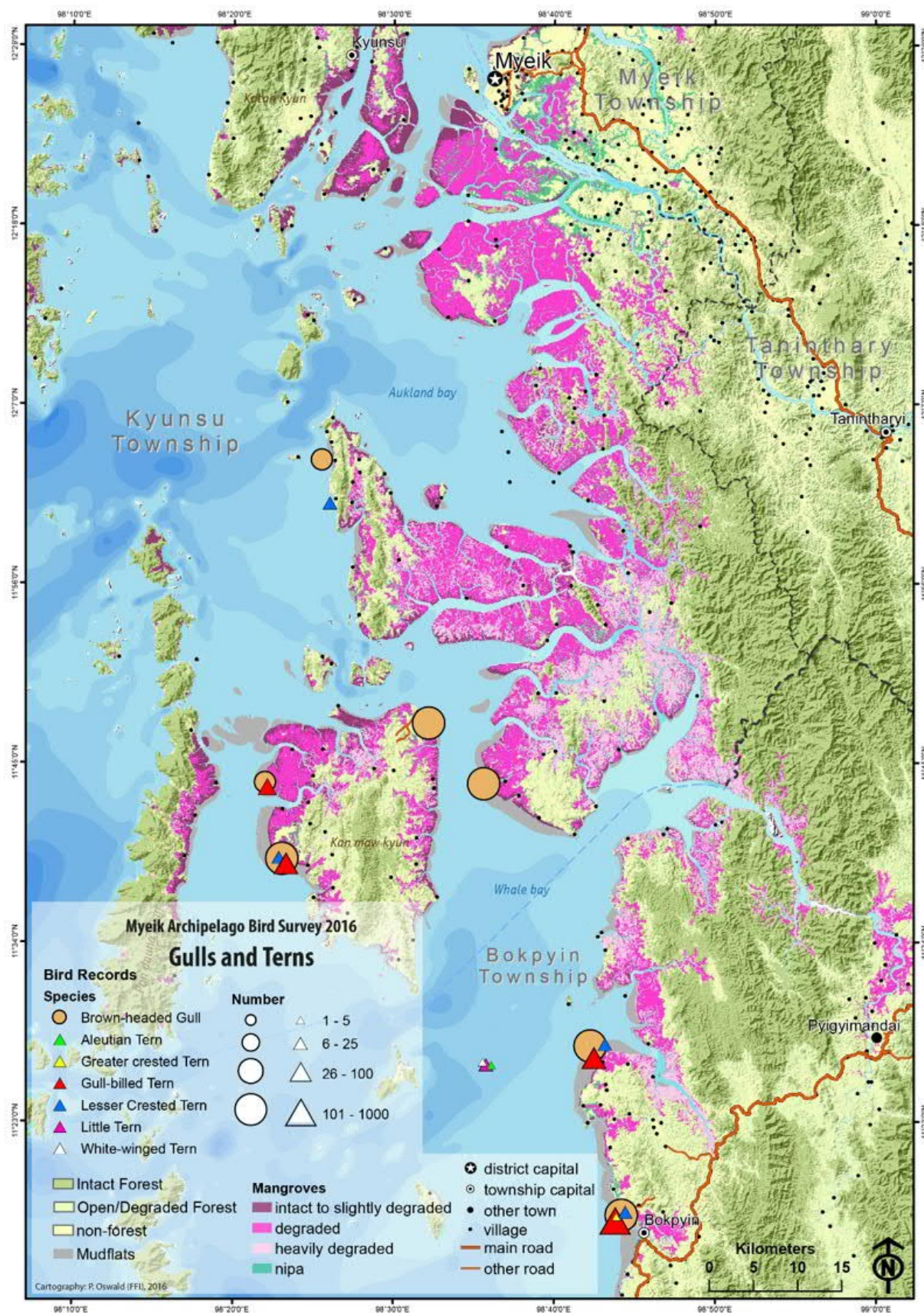


Figure 4: Distribution of gulls and terns in the southern Myeik Archipelago © C Zockler/FFI (2016)



Gull-billed Terns at High Tide Roost in fishing rack March 2016 © C Zockler/FFI (2016)

Aleutian Tern *Sterna aleutica*

At least four different individuals, possibly all involving this tern species, were roosting on drifting wood in the sea between Bokpyin and Kan Maw Island (see figure 4). As these birds were randomly picked up among a few Greater Crested and Little Terns, it is likely that there might be more individuals wintering in this little surveyed area. There is very little known about the wintering distribution of this sub-arctic tern. The range-restricted tern is breeding almost entirely in the Bering Sea region and the Sea of Okhotsk with 80% of its breeding population in Russia (Renner et al 2015). In addition to the South China Sea and waters around Indonesia the southern Andaman Sea might be another important site for the species and future surveys are needed to reveal the extent of wintering birds in Myanmar coastal waters.

Egrets, herons and cormorants

Alongside waders, egrets and herons inhabit the intertidal mudflats as well as the adjacent mangroves in good numbers. A total of nine species have been recorded. Most common were Little and Great Egret followed by Indian and Chinese Pond Herons (Figure 5), which both were mostly in non-breeding plumage and cannot easily be told apart. In total about 800-1,000 egrets and herons have been observed in the mangroves, but the number could be much higher and well over 1,000 birds.

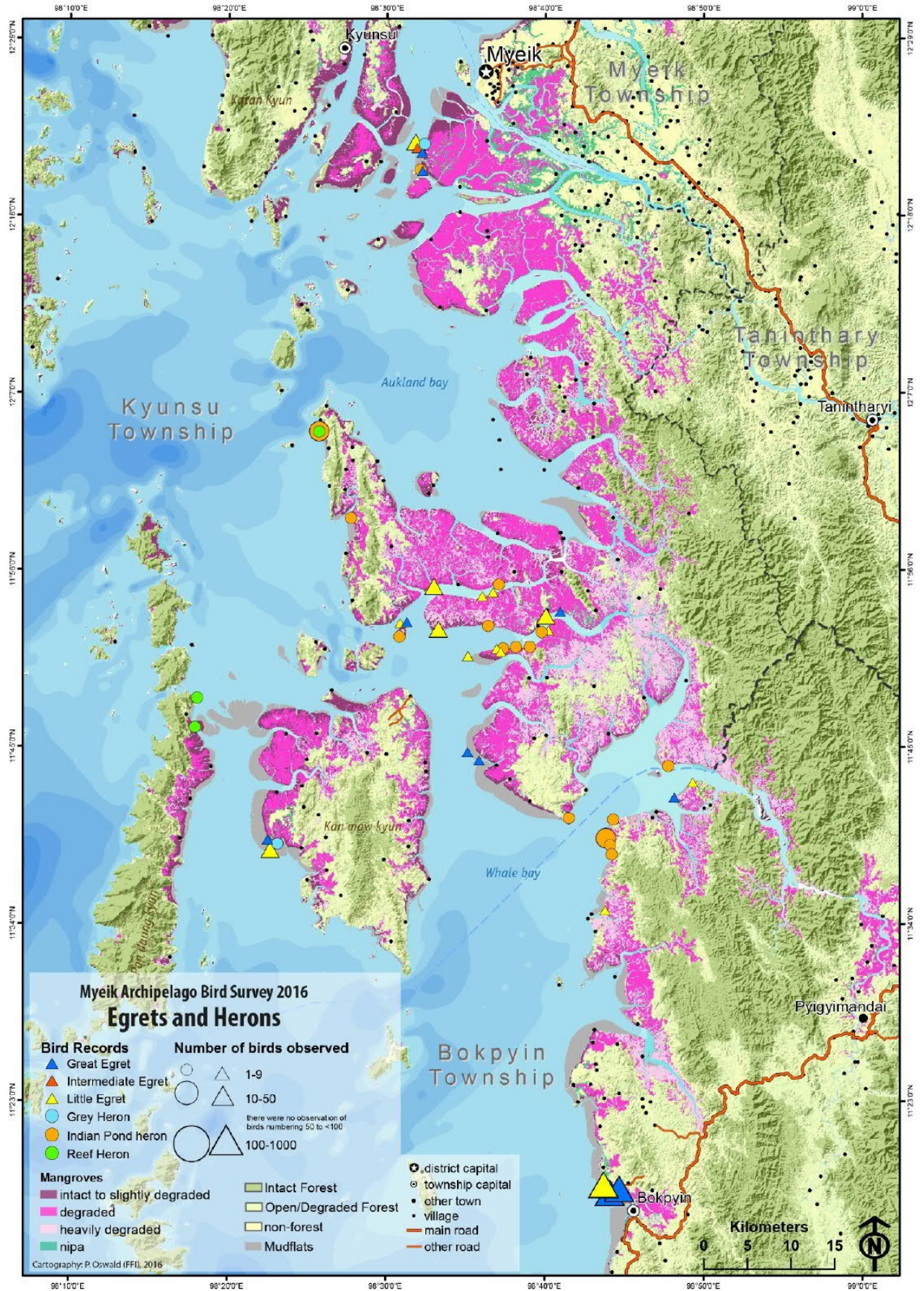


Figure 5: Distribution of egrets and herons in southern Myeik Archipelago © C Zockler/FFI (2016)

2.3 Mangroves



The mangroves found in this region are of extraordinary constitution, diversity and maturity. These mangroves show a mature state of forest that has not been seen anywhere else along the coast in the country, illustrating the potential of mature mangrove forests for biodiversity and other vital ecosystem services that in many areas have been lost already. Along the broad coastline between Myeik in the north and south of Bokpyin near Karathuri in the south consists of an estimated total of 186,000 ha of mangrove habitat (left; mangrove is shown as pink).

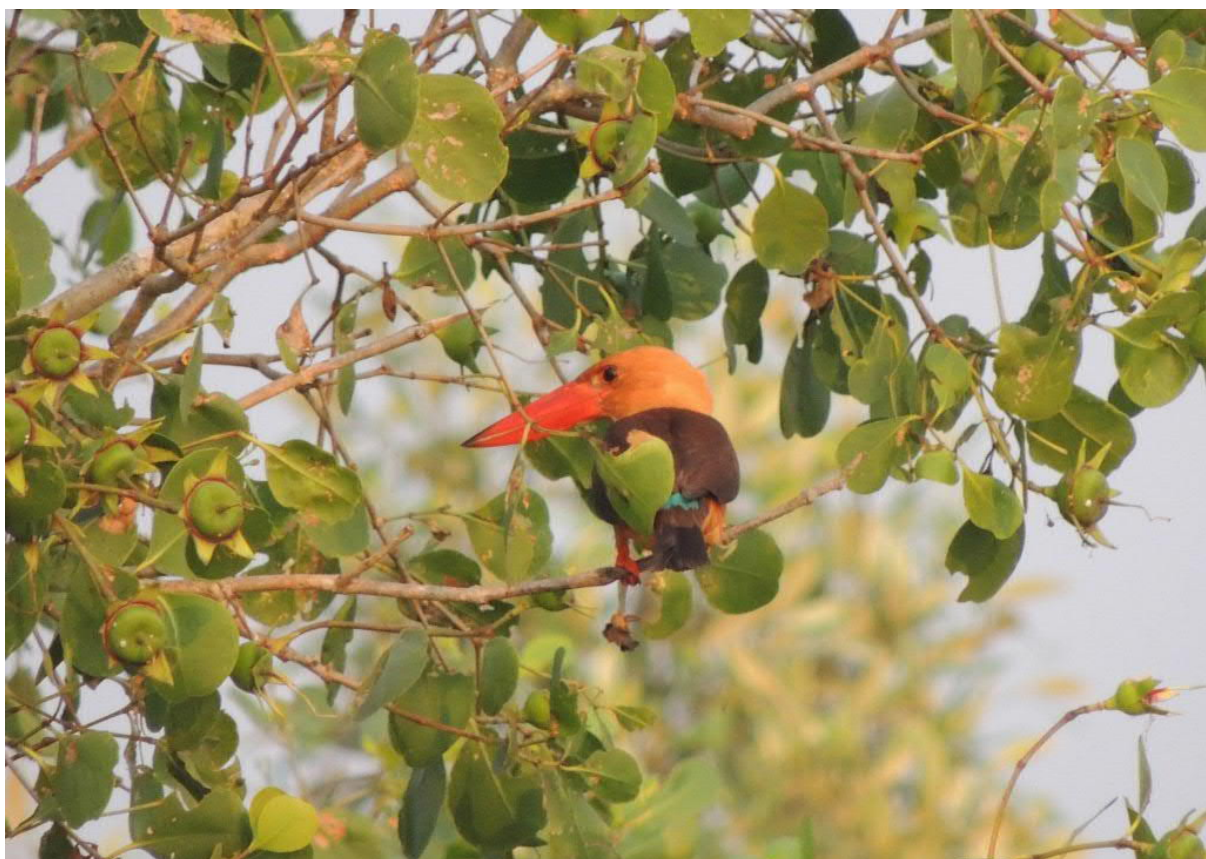
The extensive mangroves are home to several globally threatened and near-threatened species (see Table 3). The Lesser

Adjutant Stork is closely associated with mangrove habitats and most likely breeding in the survey area, although no clear indication has been noted (see also paragraph on the species above). Mangroves host a large number of globally near-threatened species, such as Red-breasted Parakeet and Chestnut-bellied Malkoha. Also, the following species have been observed and associated mostly with mangrove habitats: Black-bellied Malkoha, Mangrove Whistler, Golden-bellied Gerygone and Copper-throated Sunbird (see Figure 7). The latter has not been recorded previously and is little known in its current distribution. Golden-bellied Gerygone *Gerygone sulphurea* were only confirmed as resident bird in Myanmar in 2015 (Moses & Zöckler 2015), but according to this survey are more widely distributed than previously thought (Figure 7) and it is likely that the species is distributed throughout the Myeik mangrove system. Large numbers of over 80 Collared Kingfisher are an additional indicator of mature mangroves.

Two species, the Brown-winged Kingfisher and the Mangrove Pitta are strongly associated with mangrove habitats of the survey area and have been a special focus of this survey.

Brown-winged Kingfisher *Pelagopsis amauroptera* (NT)

During our survey Brown-winged Kingfisher have been observed throughout the area (see figure 6). From 27 survey stops of ca. 100 ha size we recorded a minimum of 1 -4 individuals of this kingfisher species. On average 1.3 pairs/ 100 ha. Extrapolated over the entire available habitat this would translate into 2400 territories or pairs (see table 3). This figure is likely to be just a minimum, largely based on few observation but mostly on sound recordings during a rapid assessment with often less than 15 minutes presence at the plot. Even though the species was actively calling, it is likely that on average higher numbers could have been present in the surveyed area. During a survey in December 2013 Moses *in litt.* recorded up to 20 birds in a 4-5 sq.Km plots that have been surveyed for several hours, confirming a high density of the kingfisher throughout the mangroves in the survey area. However, the species was not recorded in the mangroves north of Myeik and might not be distributed across the region, at least not in high densities. Yet, the total estimated 2,400 pairs appears to be a lower estimate for this species.



Brown-winged Kingfisher perching in mangroves at Kyunsu Island © C Zockler/FFI (2016)

Mangrove Pitta *Pitta megarhyncha* (NT)

Similar to the Brown-winged Kingfisher the Mangrove Pitta is strongly linked to mangrove habitats. During our survey the Mangrove Pitta was recorded almost everywhere (see figure 6). In fact, it was striking to realise that whenever the boat engine was stopped and we paused for at least 15 minutes in suitable mangrove habitats, we heard at least one and in some places up to six different Mangrove Pittas from one spot, in an area of little more than 100 ha. Based on 28 sample plots and an average 2.7 recorded Mangrove Pittas the total population of Mangrove Pittas for the entire region between Myeik and Karithuri was extrapolated to about 5050 pairs or territories.

Considering the high calling activity during the pre-breeding survey period in March this average recorded number over the 28 sample plots seems to be reasonable and accurate. Calling activity is highest in pre-breeding season March to May (Erritzoe 2003). The actual figure could be even higher, due to the brief duration of our visits to some plots. Also, during surveys in 2013, Mangrove Pittas were recorded at up to eight in one plot in Aukland Bay north of our 2016 survey area, suggesting a wide distribution throughout the mangroves. However, north of Myeik the Mangrove Pitta was not recorded during several surveys in Dec 2013, Nov 2014, Jan and May 2015 and hence this part is not included in the extrapolation.

The total of over 5,000 pairs might be an over estimation, when assuming that the survey might have favoured near coastal habitats that might be the preferred habitat of Mangrove Pittas and habitats further inland might be inhabited by lower densities. The total figure might be slightly lower taking a bias towards near coastal mangroves into account. However, Mangrove Pitta was also recorded further inland but future surveys should take careful consideration of a less even distribution within the mangrove area.

Distributed along the mangroves between Bangladesh and Sumatra, its distribution is rather patchy and hence very vulnerable to mangrove losses. The population size of this species across the range has not been quantified (BirdLife International 2016), but it is described as generally scarce to locally common. Estimates are not available but it is not common in some small places in Bangladesh and Thailand, but widespread and common still in Sumatra. From Myanmar the species is also only known to be more widespread from the Meinmahla Kyun Wildlife Sanctuary where an estimated 50-100 pairs may hold territories (Moses & Zöckler 2015b). This means that the Myeik mangroves are one of the most important areas for the species in Myanmar and possibly globally alongside the mangroves of Sumatra (Erritzoe 2003, Birdlife International 2001) and even though we do not have a total population estimate we can state that the Myeik mangroves constitutes for a large proportion of the population and the Mangrove Pitta population and justifies the Mangrove Region to be a KBA on the basis of the new criteria B1, B2 and B3 (IUCN 2016).

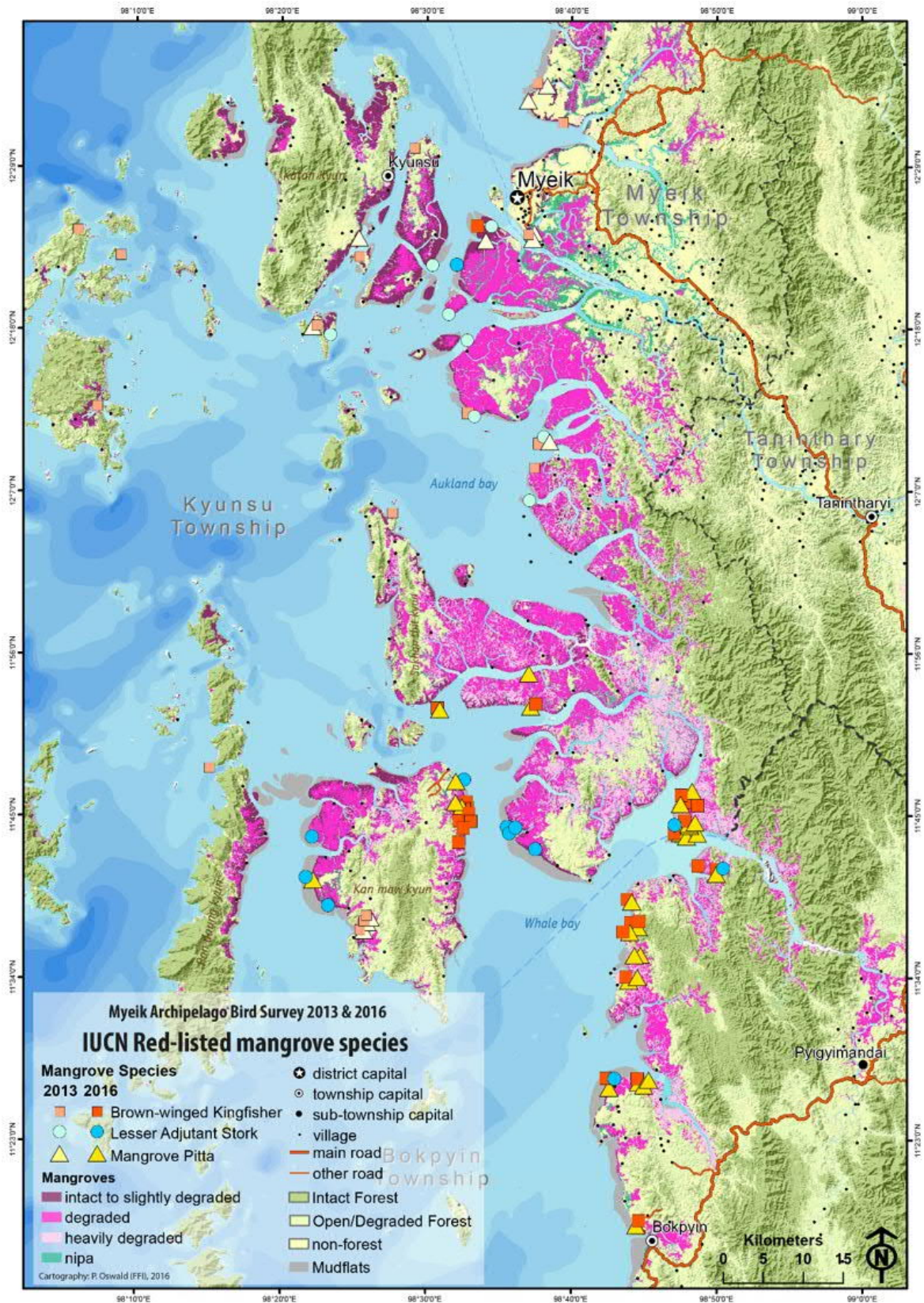


Figure 6: Globally threatened or near-threatened Mangrove Bird Species with observations from surveys in 2013 in the more northern part included (same symbols in fainter colours)

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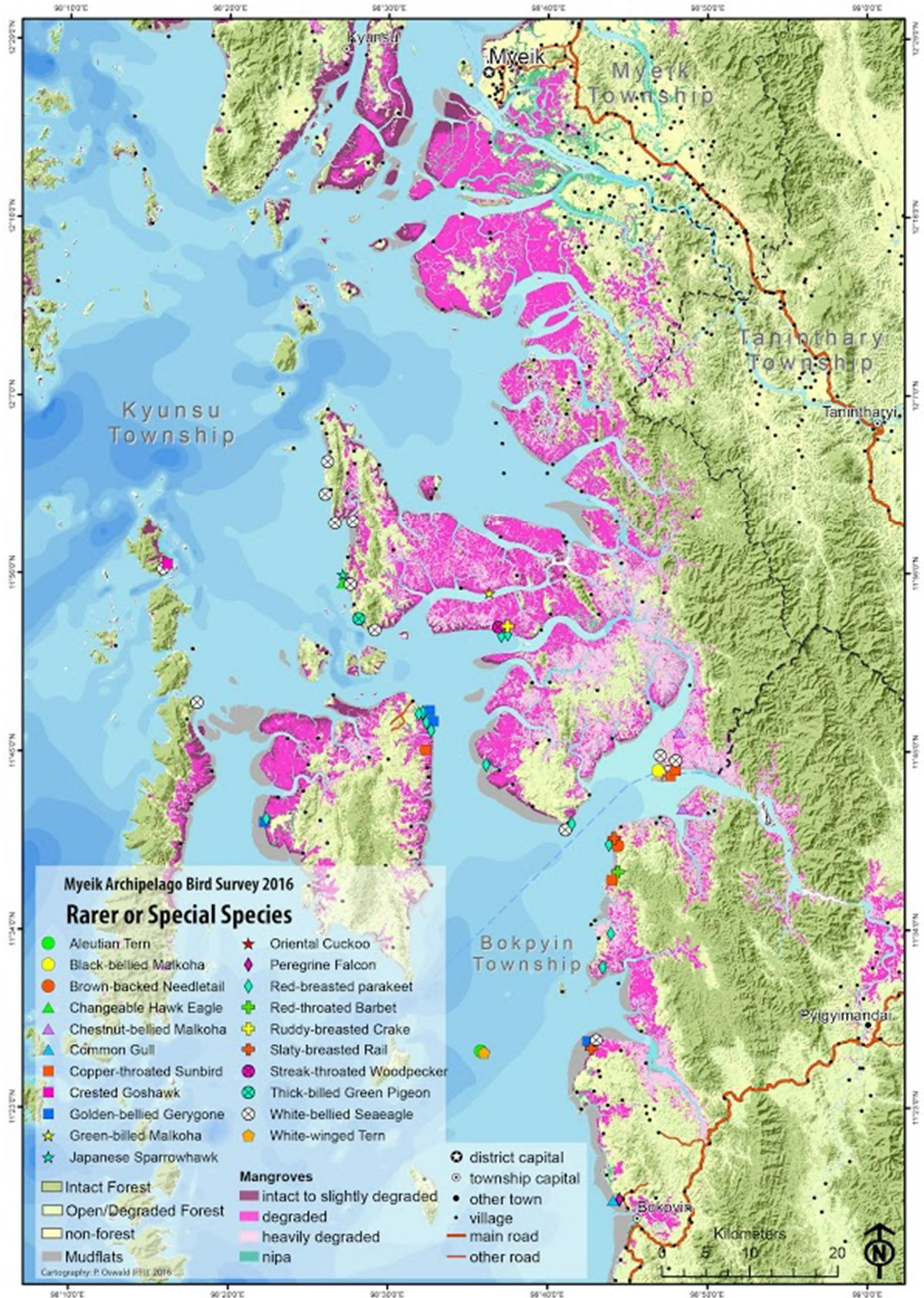


Figure 7: Selected rare or specialised species in the survey area © FFI 2016

2.4 Sundaic Tropical Forests



Intertwined between the mangroves, often on rocky outcasts are large stretches of tropical rainforest of the Sundaic ecoregion. They belong to the Myanmar coastal rain forest type (Wikramanayake et al. 2002). These forest are largely unaffected by human activity and very rich in biodiversity. Figure 6 shows some selected species that reflect this forest type, like the Red-breasted Parakeet, Red-throated Barbet, and Crested Goshawk among many others (see also Figure 7). Two globally threatened species, the Plain-pouched Hornbill and the Great Slaty Woodpecker represent the forest of the region unlike any other bird.

Plain-pouched Hornbill *Rhyticeros subruficollis* (VU)

The extraordinary high number of almost 200 Plain-pouched Hornbills, observed in December 2013 (Moses & Zöckler 2015a) has not been quite matched during this survey that also focussed on more mangrove areas closer to the mainland, but a total of nine birds were observed. This is still a reflection of the high biodiversity value of these forest habitats. Figure 2 shows the distribution of this globally threatened (VU) hornbill species across the survey area but largely restricted to island forests. The species has a very limited global distribution in Myanmar, Thailand and Malaysia (BirdLife International 2016) and South Myanmar is a stronghold for the species. With strong declines noted for the Centre in Myanmar especially the Sittaung Valley, the Myeik Archipelago might be the last stronghold at least in Myanmar but possibly for the entire population. In fact together with the more southern population in Lampi NP the Myeik Archipelago might host 400-500 birds, which represents almost a third of the lowest limit of the global population estimate (BirdLife International 2001) of 1,500-7,000 mature individuals. As this estimate is already 15 years old it is very likely that with ongoing deforestation the number might be much closer to the lower limit. The species qualifies for criteria A1b, A2b, B1 B2 and B3 to list the area as KBA (IUCN 2016).

Great Slaty Woodpecker *Mulleripicus pulverlintus* (VU)

Great Slaty Woodpecker were recorded at three locations (Figure 2) adding to the previous nine observations from further western areas (Moses & Zöckler 2015a). The species could be much more common in the Sundaic Forest but as the main focus of this survey was on mangroves, island forest types were underrepresented. This declining species is still widespread in Tanintharyi Region and throughout Myanmar but deforestation is threatening the species severely.

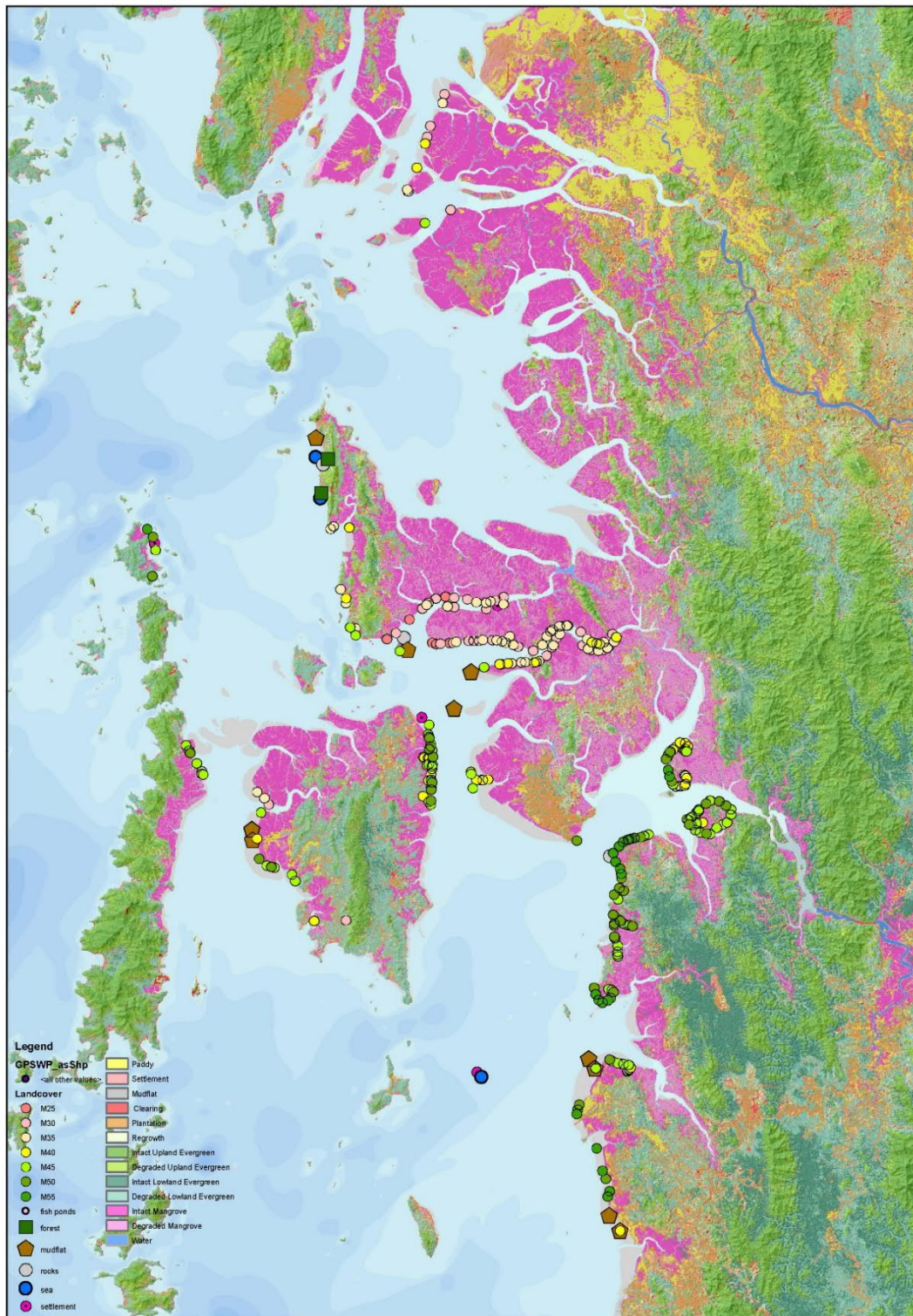


Figure 8: Level of Mangrove Degradation based on visual rapid assessment at sites visited © C Zockler/FFI (2016)

3. THREATS TO BIRDS

3.1 Development

A great threat to the area is development. The Northern Archipelago is close to the regional city and hub Myeik, which is economically booming. The city is expanding and encroaching more and more into the mangrove forest area. 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 protection for these valuable sites.



Housing and hotel development in mangrove areas north of Myeik © C Zockler/FFI (2016)

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 below).

3.2 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 1,000 individuals, bird hunters are setting up their

traps as revealed from the village of Kanbijn in the northern part of the area. This is likely to be the case in those roost sites in areas near Bokpyin but has not been confirmed yet.

3.3 Plastic

The amount of plastic is staggering and visible everywhere. Together with natural debris it is floating in coastal waters and washed along the shore of smaller islands. Its origin is not always clear and it seems to be a new and recent phenomenon and likely more domestic than from foreign sources. We observed several times how villagers assembling rubbish emptied the bins directly into the sea!

3.4 Deforestation

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. Figure 8 shows the level of mangrove degradation based on level assessment as described in the methods.

To illustrate also the urgency of any action Figure 9 shows the actual chain sawing activity during the survey stops. Each of the sites depicted with a chain saw was actually cutting trees at the time of our visit. In one case the mangroves were even cut at night using high powered torches! At several occasions we also observed the transport of logged timber and people cutting wood with axes. At no time we were aware of anybody from the forest department or police or military controlling the logging. There is logging for timber extraction but most commonly now observed in the survey area is the extraction of timber for char-coal production.



In addition near the town of Myeik logging has intensified over recent years and observed over a large area south of Myeik due to increasing demand for fuelling the fish factory in Myeik of produce fish crackers for export to Thailand Malaysia and other Asian countries! (see also photos below)

Fresh logging at Kyunsu Island © C Zockler/FFI (2016)

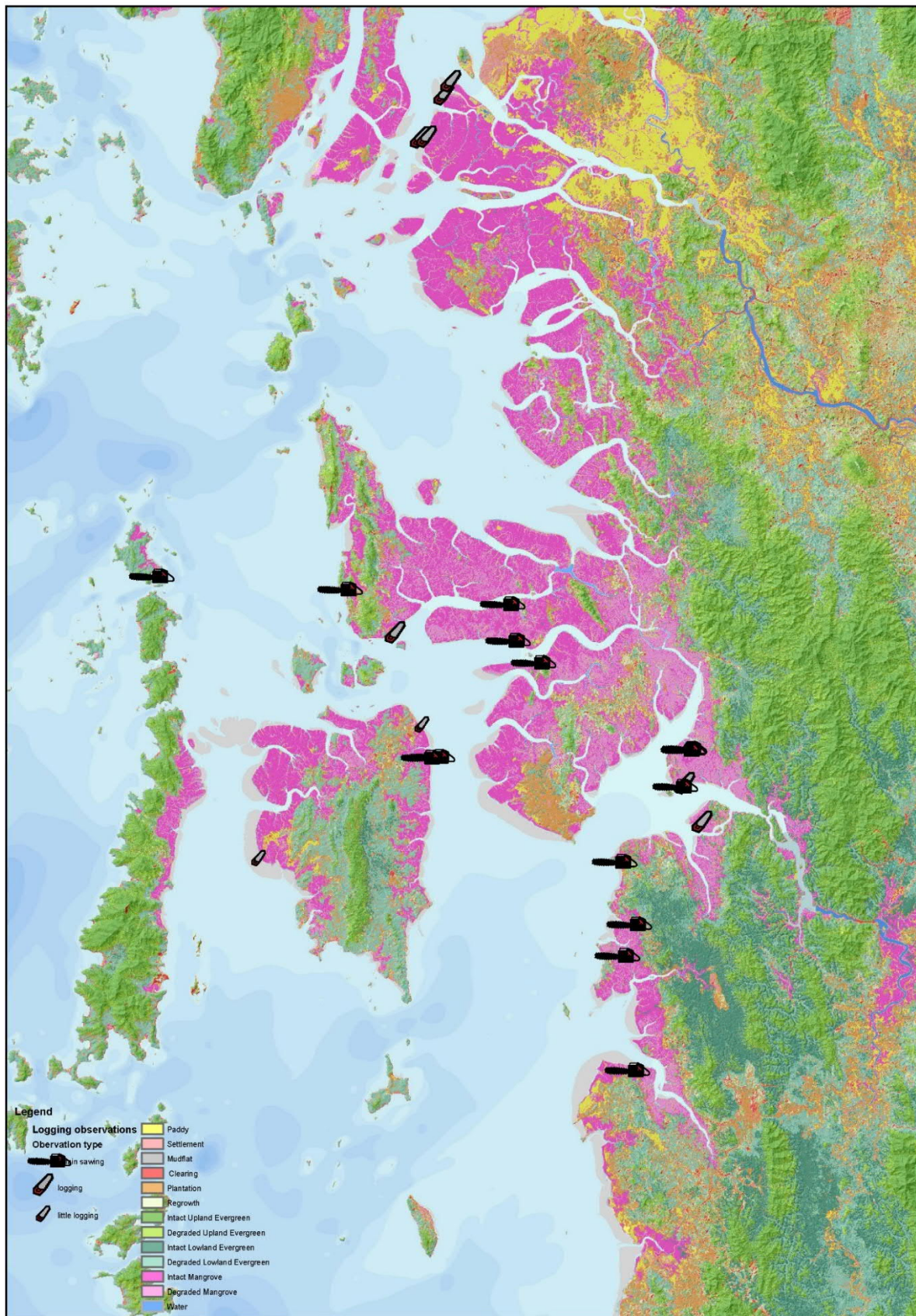


Figure 9: Actual chain sawing activity and cutting while visiting the mangrove sites © C Zockler/FFI (2016)



Fresh logging at Kyunsu Island © C Zockler/FFI (2016)



Timber storage near Myeik © C Zockler/FFI (2016)



Timber transport south of Sakhon Thit © C Zockler/FFI (2016)



New village on the Sakhan Thit mangrove belt © C Zockler/FFI (2016)



Chain saw and axe used for firewood near villages and on the outer islands © C Zockler/FFI (2016)

At several locations we observed the development of new villages, which seems to accelerate the deforestation of neighbouring mangroves. There do not appear to be any regulations of planning for new villages, but this might not be the case.

4. DISCUSSION

4.1 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.

The intertidal mudflats of the survey area are highly productive ecosystems, providing food and staging areas for many different bird species. In total over 9,400 waders, gulls and terns have been recorded in the southern mudflats alone. But adding another maximum of 2,000 egrets and herons, and high numbers of Whimbrel (over 1,000), Redshank (over 3,000) and Terek Sandpiper (over 300) from Auckland Bay, we might reach almost 16,000 waterbirds. Areas further south of Bokepyin may host more water birds, so it is quite likely that the entire mudflat area in the southern Archipelago might fulfil the Ramsar criteria of 20,000 waterbirds. Table 4 lists four species that passed another Ramsar criterion; ie, 1% of the flyway population. These are Whimbrel (at least 1.4%), Eurasian Curlew (1.6%), Common Redshank (at least 1.1%) and Brown-headed Gull (2.1%). The Lesser Adjutant Stork (VU) qualifies for the 1% flyway population criterion together with the numbers recorded in Auckland Bay (Zöckler et al. 2014) with a total of 45-60 birds. Table 4 also lists one additional globally threatened and a total of five near-threatened waterbirds, highlighting the significance of the area. Based on the 1% flyway population criterion alone, the Southern Myeik intertidal mudflats qualify for designation as a Ramsar site.

4.2 Importance of the Mangroves and KBA status

The mangrove and associated mudflats are exceptionally rich and diverse and deserve conservation in their entirety. They are crucially important for at least 1% of the globally threatened Lesser Adjutant Stork. The extrapolated approximate 5,000 territories of Mangrove Pitta (NT), as well as the extrapolated 2,400 territories of Brown-winged Kingfisher (NT; see also table 3) reflect a still healthy condition. More importantly, it points to the fact that probably a large proportion of the unknown total populations of these two globally near-threatened, but range-restricted species (BirdLife International 2016) rely on the mangroves of the Southern Myeik Archipelago. In addition to the globally threatened waders, those three mangrove species live most if not their entire life within the mangroves and intertidal mudflats of the area and justify the Southern Myeik Mangroves and Mudflats as KBAs under criterion

A1b (more than 1% of the flyway population for a 'Vulnerable' species), and most likely B1 for range restricted species such as Mangrove Pitta and Brown-winged Kingfisher.

4.3 Conservation Recommendations

Both these habitats and the mangroves specifically are highly threatened by rapidly increasing forest degradation and knock-on effects for the adjacent mudflats.

The mangroves in southern Inner Myeik Archipelago are one of the most mature and pristine or intact mangroves left in Myanmar but 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! The mangroves are heavily subjected to logging for increasing domestic use as well as income sources in the form of charcoal production. Several actions for conservation are proposed below. But logging is systemic and widespread across the entire region (see figures 8 and 9) and activities need to embrace the entire local communities. The logging frequencies and the density of logging activities has increased rapidly according to several local witnesses. This process has been especially accelerated by the increased availability of cheap chain saw imports from China over the past 5 years! Urgent action is required to halt the rapidly increasing degradation before any conservation efforts will be in vain.

Ideally, together with local communities, regional authorities and other stakeholder, the mangroves should be protected and managed by communities in alliance with local NGOs. Potential partners and donors can be found in the Mangrove for the future (MFF) initiatives, which Myanmar recently has joined and also other international aid mechanisms.

When designing any future protected area, either Ramsar site, Biosphere Reserve or any other type of reserve, it is important to appreciate the sheer size of the area and the huge amount of settlements and villages within the area. The Man & Biosphere Reserve (M&B) concept of the UNESCO allows the best form of protected area with designating an M&B Reserve by defining core, buffer and development zones, where different management schemes can be agreed upon for a sustainable development of the region. Many parts of the area deserve the designation of a Ramsar site and both dominations are possible and a future prospect of the area in form of Biosphere Reserve has many advantages also for the sustainable economic development of the region.

Awareness Raising

In addition to better law enforcement an awareness raising campaign is proposed. One of many anticipated prospects of awareness raising for mangrove protection and a potential output is the establishment of a Mangrove Festival.

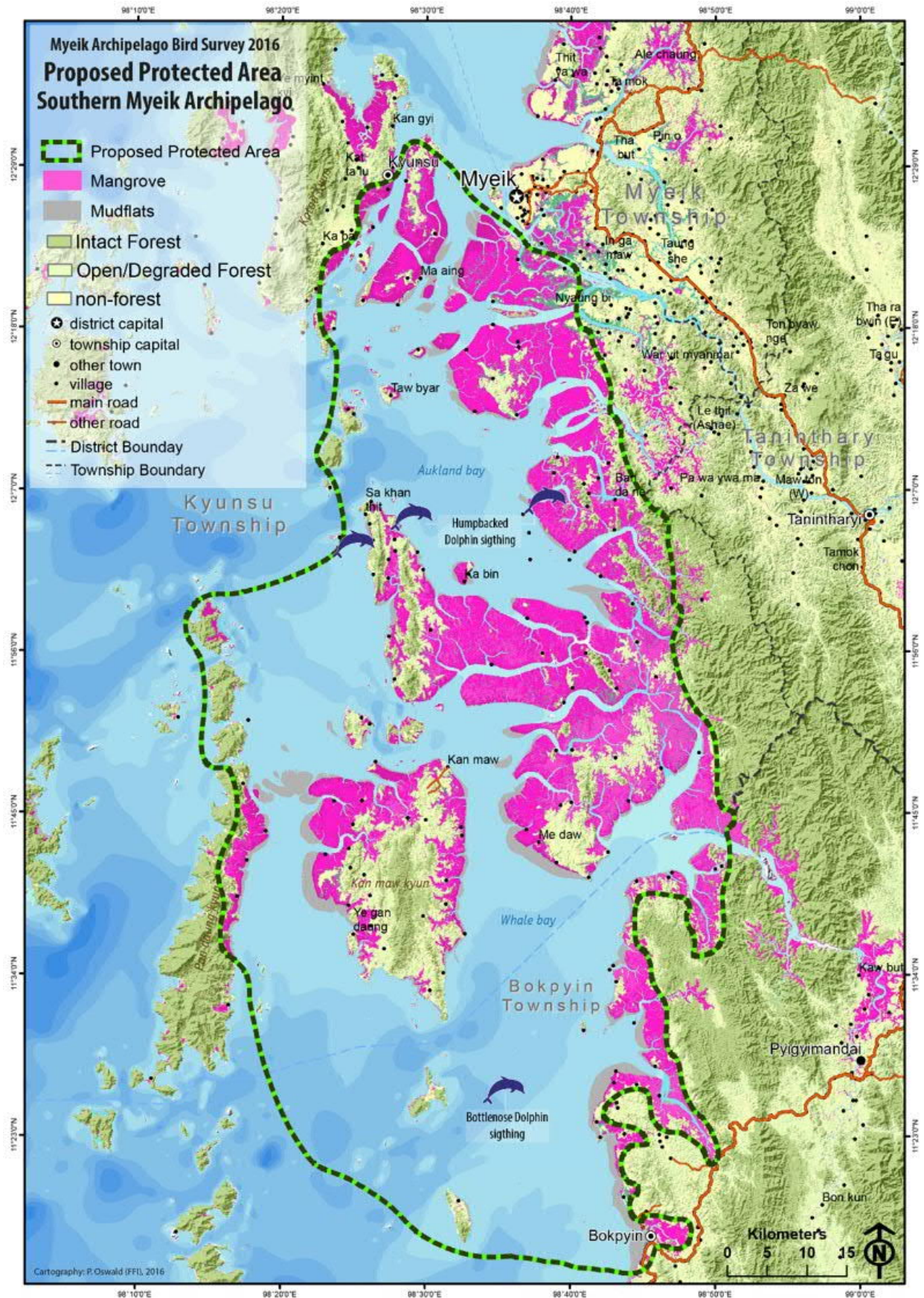


Figure 10: Key area for future proposed Protected Areas for the southern part of the Myeik mudflats and mangrove areas © C Zockler/FFI (2016)

Mangrove festival

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 Mangrove Festival should be ideally an event with a mix of information, high level representation, local celebrities and fun. 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.

A first such event has been proposed and agreed in principle for the autumn 2016 in the village of Sakhan Thit. The following possible agenda is proposed and has been partly discussed with local stakeholders and village leaders. It is anticipated that a regional or local representative from the Tanintharyi or Myeik Region and township representatives as well as village leaders will open the event, followed by a monk or spiritual leader in the region. This will be followed by a lecture on the value of mangroves by e.g. the Myeik University or Patheingyi University, or either of them.

This should be followed by games, such as a boat race between village teams or island teams, or perhaps young people teams competing for the most crab species, collected in two hours in a bucket for young people 8-16, with a mangrove crab expert in the jury and released afterwards of course. Lots of nice prizes (T-shirt etc.), food stands, small entertainment and info stands etc.

The key event will be a chain saw handing-in-event. In the name of 'Making peace with the Mangroves' this agenda item is chaired and overseen by the local monks. They will give their blessing to this event. Volunteers, villagers and other people can hand in their chain saw in return for the price of purchase and a certificate, that outlines why and that mangroves are now protected and serve long term for the livelihoods of local people, etc.; signed by the organisers (Local township) and the monk, a special medal or reward or token (?). Potentially, in exchange for the chain saw, villagers will receive in return a solar cooker or a char-coal efficient stove. These items could be provided by a governmental donor and need to be organised. Funding would also be necessary for the preparation and organisation of the event. A more detailed programme will need to be developed and agreed with by the local communities and co-organisers and a budget will need to be prepared. Several potential donors including 'Mangroves for the Future' have been identified but action is urgent as the level of logging is increasing.

First consultations with local village leaders were aiming at hosting such a festival in November or December this year (2016). The village leader of Sakhan Thit village on the

same-named island is ready to co-host the event in his village. The village is very suitable, as it is central a good location and also relatively prosperous.

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. It is not clear if hunting also occurs in the southern mudflats near Bokpyin, but the fact that over 1,400 Curlew are roosting there seems to be appealing for some hunters. 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.

Further bird surveys are recommended in areas NW of Kan Maw island and on the mudflats of Me daw peninsula which were either not accessible or not surveyed for time constraints, but deemed to be promising. Also large areas of mudflats south of Bokpyin have not been surveyed yet and also the mangroves in this area would require an assessment on the level of degradation. 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.

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ANNEX 1: BIRD LIST

Common New Name	Scientific name	IUCN	Individuals
PHASIANIDAE: PHASIANINAE: Pheasants & junglefowl			
Red Junglefowl	<i>Gallus gallus</i>		3
ANTIDAE: DENDROCYGNINAE: Whistling-ducks			
Lesser Whistling-Duck	<i>Dendrocygna javanica</i>		350+
CICONIIDAE: Storks			
Lesser Adjutant	<i>Leptoptilos javanicus</i>	VU	23
THRESKIORNITHIDAE: THRESKIOGNITHINAE: Ibises			
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	18
ARDEIDAE: ARIDEINAE: Herons & egrets			
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>		1
Little Heron	<i>Butorides striata</i>		17
Indian Pond-Heron	<i>Ardeola sp</i>		220+
Chinese Pond Heron	<i>Ardeola sp</i>		4
Eastern Cattle Egret	<i>Bubulcus coromandus</i>		8
Grey Heron	<i>Ardea cinerea</i>		4
Great Egret	<i>Ardea alba</i>		240+
Intermediate Egret	<i>Mesophoyx intermedia</i>		1
Little Egret	<i>Egretta garzetta</i>		510
Pacific Reef-Egret	<i>Egretta sacra</i>		8
PHALACROCORACIDAE: Cormorants			
Little Cormorant	<i>Phalacrocorax niger</i>		178
FALCONIDAE: PANDIONINAE: Osprey			
Osprey	<i>Pandion haliaetus</i>		1
FALCONIDAE: ACCIPITRINAE: Hawks, eagles & allies			
Peregrine Falcon	<i>Falco peregrinus</i>		1
Oriental Honey-Buzzard	<i>Pernis ptilorhynchus</i>		7
Black-shouldered Kite			1
Black Kite	<i>Milvus migrans</i>		5
Brahminy Kite	<i>Haliastur indus</i>		350+
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>		16
Crested Serpent-Eagle	<i>Spilornis cheela</i>		9
Booted Eagle	<i>Aquila pennatus</i>		1

Common New Name	Scientific name	IUCN	Individuals
Shikra	<i>Accipiter badius</i>		2
Japanese Sparrowhawk	<i>Accipiter virgatus</i>		2
Crested Goshawk			2
Changeable Hawk-Eagle	<i>Nisaetus limnaeetus</i>		1
RALLIDAE: Rails, crakes, gallinules & coots			
Slaty-breasted Crake	<i>Gallirallus striatus</i>		4
Ruddy-breasted Crake	<i>Porzana fuscata</i>		2
PLUVIALIDAE: Pluvialis plovers			
Red-wattled Lapwing	<i>Vanellus indicus</i>		2+
Pacific Golden Plover	<i>Pluvialis fulva</i>		180+
Grey Plover	<i>Pluvialis squatarola</i>		80+
CHARADRIIDAE: Charadrius plovers & allies			
Kentish Plover	<i>Charadrius alexandrinus</i>		460
Little Ringed Plover			5
Lesser Sand-Plover	<i>Charadrius mongolus</i>		720+
Greater Sand-Plover	<i>Charadrius leschenaultii</i>		25
SCOLOPACIDAE: TRINGINAE: Godwits, dowitchers, curlews, sandpipers			
Bar-tailed Godwit	<i>Limosa lapponica</i>		230
Asian Dowitcher	<i>Limnodromus semipalmatus</i>		25
Whimbrel	<i>Numenius phaeopus</i>		750+
Eurasian Curlew	<i>Numenius arquata</i>	NT	1690
Terek Sandpiper	<i>Xenus cinereus</i>		368
Common Sandpiper	<i>Actitis hypoleucos</i>		46
Common Greenshank	<i>Tringa nebularia</i>		22
Nordmann's Greenshank	<i>Tringa guttifer</i>	EN	3
Common Redshank	<i>Tringa totanus</i>		1230
Wood Sandpiper	<i>Tringa glareola</i>		2
SCOLOPACIDAE: CALIDRIDINAE: Calidris sandpiper & allies			
Great Knot	<i>Calidris tenuirostris</i>	VU	850
Little Stint	<i>Calidris minuta</i>		2
Red-necked Stint	<i>Calidris ruficollis</i>		37+
Temminck's Stint	<i>Calidris temminckii</i>		2
Curlew Sandpiper	<i>Calidris ferruginea</i>		20
Broad-billed Sandpiper	<i>Limicola falcinellus</i>		20+
SCOLOPACIDAE: ARENARINAE: Turnstones & allies			
Ruddy Turnstone	<i>Arenaria interpres</i>		12
STERNIDAE: Noddies & terns			

Common New Name	Scientific name	IUCN	Individuals
Little Tern	<i>Sternula albifrons</i>		125
White-winged Tern	<i>Chlidonias leucopterus</i>		2
Aleutian Tern			
Lesser Crested Tern	<i>Thalasseus bengalensis</i>		21
Great Crested Tern	<i>Thalasseus bergii</i>		22
Gull-billed Tern	<i>Gelochelidon nilotica</i>		288
LARIDAE: Gulls & allies			
Brown headed Gull	<i>Chroicocephalus brunnicephalus</i>		3040+
Common Gull	<i>Larus canus</i>		1
COLUMBIDAE: COLUMBINAE: Typical pigeons & doves			
Rock Pigeon	<i>Columba livia</i>		60
Red Collared-Dove	<i>Streptopelia tranquebarica</i>		4
Spotted Dove	<i>Streptopelia chinensis</i>		9
Emerald Dove	<i>Chalcophaps indica</i>		2
COLUMBIDAE: TRERONINAE: Green-pigeons, imperial-pigeons & allies			
Pink-necked Green-Pigeon	<i>Treon vernans</i>		19
Thick-billed Green-Pigeon	<i>Treon curvirostra</i>		1
Green Imperil-Pigeon	<i>Ducula aenea</i>		14
PSITTACIDAE: LORICULINAE: Hanging-parrots			
Vernal Hanging-Parrot	<i>Loriculus vernalis</i>		30
PSITTACIDAE: PSITTACINAE: Parrots & parakeets			
Red-breasted Parakeet	<i>Psittacula alexandri</i>	NT	34
CUCULIDAE: CUCULINAE: Old World cucukoos			
Plaintive Cuckoo	<i>Cacomantis merulinus</i>		2
Oriental Cuckoo	<i>Cuculus saturatus</i>		1
Asian Koel	<i>Eudynamys scolopaceus</i>		55+
CUCULIDAE: PHAENICOPHAEINAE: Malkohas & allies			
Green-billed Malkoha	<i>Rhopodytes tristis</i>		1
Black-bellied Malkoha			1
Chestnut-bellied Malkoha			2
CUCULIDAE: CENTROPODINAE: Coucals			
Greater Coucal	<i>Centropus sinensis</i>		25
STRIGIDAE: Typical owls			
Collared Scops-Owl	<i>Otus lettia</i>		2
Asian Barred Owlet	<i>Glaucidium cuculoides</i>		1
Brown Boobook	<i>Ninox scutulata</i>		1

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CAPRIMULGIDAE: CAPRIMULGINAE: Typical nightjars			
Large-tailed Nightjar	<i>Carprimulgus macrurus</i>		9
APODIAE: APODINAE: Typical swifts			
Edible-Nest Swiftlet	<i>Aerodramus fuciphaga</i>		100+
Germain's Swiftlet	<i>Aerodramus germani</i>		100+
Brown-backed Needletail	<i>Hirundapus giganteus</i>		1
Asian Palm-Swift	<i>Cypsiurus balas</i>		30+
House Swift	<i>Apus affinis</i>		
APODIDAE: HEMIPROCNINAE: Treeswifts			
Grey-rumped Treeswift	<i>Hemiprocne longipennis</i>		33
CORACIIDAE: Rollers			
Indian Roller	<i>Coracias benghalensis</i>		4
Dollarbird	<i>Eurystomus orientalis</i>		21
ALCEDINIDAE: HELCYONINAE: Larger kingfishers			
Brown-winged Kingfisher	<i>Pelargopsis amauroptera</i>	NT	35
White-throated Kingfisher	<i>Halcyon smyrnensis</i>		1
Black-capped Kingfisher	<i>Halcyon pileata</i>		31
Collared Kingfisher	<i>Todiramphus chloris</i>		37
ALCEDINIDAE: ALCEDININAE: Smaller kingfisher			
Common Kingfisher	<i>Alcedo atthis</i>		14
MEROPIDAE: Bee-eaters			
Little Green Bee-eater	<i>Merops orientalis</i>		4
Blue-tailed Bee-eater	<i>Mecops philippinus</i>		67
BUCEROTIDAE: Hornbills			
Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>		9
Plain-pouched Hornbill	<i>Aceros subruficollis</i>	VU	9
Wreathed Hornbill	<i>Aceros undulatus</i>		5
RAMPHASTIDAE: MEGALAIMINAE: Asian barbets			
Lineated Barbet	<i>Megalaima lineata</i>		14
Coppersmith Barbet	<i>Megalaima haemaccephala</i>		4
Red-throated Barbet		NT	1
PICIDAE: PICINAE: Typical woodpeckers			
Grey-capped Pygmy Woodpecker	<i>Dendrocopos canicapillus</i>		9
Common Flameback	<i>Dinopium javanese</i>		5
Greater Flameback	<i>Chrysocolaptes lucidus</i>		7
Great Slaty Woodpecker	<i>Mulleripicus pulverlintus</i>	VU	3
Streak-throated Woodpecker			2

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PITTIDAE: Pittas			
Mangrove Pitta	<i>Pitta megarhyncha</i>	NT	76
Golden-bellied Gerygone	<i>Gerygone sulphurea</i>		9
CAMPEPHAGIDAE: Cuckooshrikes, trillers, minivets & allies			
Ashy Minivet	<i>Pericrocotus divaricatus</i>		12
Small Minivet	<i>Pericrocotus</i>		55
PACHY CEPHALIDAE: Whistlers & allies			
Mangrove Whistler	<i>Pachycephala cinerea</i>		10
ORIOOLIDAE: Orioles & allies			
Black-naped Oriole	<i>Oriolus chinensis</i>		41
Black-hooded Oriole	<i>Oriolus xanthornus</i>		1
AEGITHINIDAE: loras			
Common lora	<i>Aegithina tiphia</i>		
RHIPIDURIDAE: Fantails			
White-throated Fantail	<i>Rhipidura albicollis</i>		3
Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i>		1
DICRURIDAE: Drongos			
Ashy Drongo	<i>Dicrurus leucophaeus</i>		25
Black Drongo	<i>Dicrurus macrocercus</i>		10+
Bronzed Drongo	<i>Dicrurus aeneus</i>		1
Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>		10
MONARCHIDAE: Monarchs, paradise-flycatchers & allies			
Asian Paradise-Flycatcher	<i>Terpsiphone paradisi</i>		2
CORVIDAE: Crows, nutcrackers, magpies, jays, treepies & allies			
House Crow	<i>Corvus splendens</i>		250+
Jungle Crow	<i>Corvus japonensis</i>		60
Racket-tailed Treepie	<i>Crypsirina temia</i>		1
Brown Shrike	<i>Lanius cristatus</i>		2
NECTARINIIDAE: Sunbirds & spiderhunters			
Brown-throated Sunbird	<i>Anthreptes malacensis</i>		56
Copper-throated Sunbird			6
Olive-backed Sunbird	<i>Cinnyris jugularis</i>		7
Little Spiderhunter	<i>Arachnothera longirostra</i>		3
DICAEIDAE: Flowerpeckers			
Orang-bellied Flowerpecker	<i>Dicaeum trigonostigma</i>		14
Pale-billed Flowerpecker	<i>Dicaeum erythrorhynchus</i>		2

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Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>		15
CHLOROPSEIDAE: Leafbirds			
Blue-winged Leafbird	<i>Chloropsis cochinchinesis</i>		2
IRENIDAE: Fairy-bluebirds			
Asian Fairy-Bluebird	<i>Irena puella</i>		7
ESTRILDIDAE: LONCHURINAE: Java Sparrow, munias,			
Scaly-breasted Munia	<i>Lonchura punctulata</i>		
PASSERIDAE: Sparrows & allies			
Eurasian Tree-Sparrow	<i>Passer montanus</i>		
MOTACILLIDAE: Wagtails & pipits			
Paddyfied Pipit	<i>Anthus rufulus</i>		3
Red-throated Pipit			1
Richard's Pipit			1
Yellow Wagtail			40+
Forest Wagtail	<i>Dendronanthus indicus</i>		1
Grey Wagtail	<i>Motacilla cinerea</i>		5
STURNIDAE: STURNINAE: Mynas, starlings & allies			
Jungle Myna	<i>Acridotheres fuscus</i>		20+
Common Myna	<i>Acridotheres tristis</i>		15+
Asian Glossy Starling	<i>Aplonis panayensis</i>		1
Common Hill-Myna	<i>Gracula religiosa</i>		19
Rock-thrushes, chats, forketails, whistling-thrushes & allies			
Siberian Rubythroat	<i>Luscinia calliope</i>		1
Eastern Stonechat	<i>Saxicola maurus</i>		1
Pied Bushchat	<i>Saxicola caprata</i>		1
MUSCICAPIDAE: MUSCICAPINAE: Old World flycatchers & allies			
Blue-throated Flycatcher	<i>Cyornis rubeculoides</i>		1
Taiga Flycatcher	<i>Ficedula albicilla</i>		4
Asian Brown Flycatcher	<i>Muscicapa dauurica</i>		10
Oriental Magpie-Robin	<i>Copsychus saularis</i>		30
White-rumped Shama	<i>Copsychus malabaricus</i>		4
PYCNONOTIDAE: Bulbuls			
Black-headed Bulbul	<i>Pycnonotus atriceps</i>		10
Stripe-throated Bulbul	<i>Pycnonotus finlaysoni</i>		30+
Yellow-vented Bulbul	<i>Pycnonotus goiavier</i>		2

Common New Name	Scientific name	IUCN	Individuals
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>		5
Red-vented Bulbul	<i>Pycnonotus cafer</i>		4
Olive Bulbul	<i>Iole virescens</i>		11
HIRUNDINIDAE: HIRUNDININAE: Martins, swallows & allies			
Barn Swallow	<i>Hirundo rustica</i>		160+
Pacific Swallow	<i>Hirundo tahitica</i>		48
PHYLLOSCOPIDAE: Seicercus & Phylloscopus warblers			
Greenish Warbler	<i>Phylloscopus trochiloides</i>		2
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>		3
TIMALIIDAE: Babblers			
Oriental White-Eye	<i>Zosterops palpebrosus</i>		160+
Pin-Striped Tit-Babbler	<i>Macronus gularis</i>		34
Abbott's Babbler	<i>Malacocincla abbotti</i>		10
ACROCEPHALIDAE: Acrocephalus warblers & allies			
Thick-billed Warbler	<i>Acrocephalus aedon</i>		1
Oriental Reed Warbler	<i>Acrocephalus orientalis</i>		3
Black-browed Reed warbler	<i>Acrocephalus bistrigiceps</i>		2
Rusty-rumped Warbler	<i>Locustella certhiola</i>		2
CISTICOLIDAE: Cisticolas, tailorbirds, prinias & allies			
Dark-necked Tailorbird	<i>Orthotomus atrogularis</i>		31
Common Tailorbird	<i>Orthotomus sutorius</i>		18
Zitting Cisticola	<i>Cisticola juncidis</i>		10

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