

MONITORING OF MIGRATORY SHORE BIRDS SURVEY IN THE GULF OF MOTTAMA

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Executive Summary

From October 2016 to March 2017, BANCA carried out monitoring shore birds survey in the Gulf of Mottama (GoM). During the survey, 40 wader species, 3 wildfowl species, 9 Gull and Tern species including 10 water bird species and 6 raptors species and **Indian skimmer (*Rynchops albicollis*)** which was newly recorded. The total number of small wader population in the upper Gulf of Mottama area is over 82,000 numbers including a minimum number of 70 Spoon-billed Sandpiper. There were also recorded one globally near-threatened species in habituating the mangrove forest Red-breasted Parakeet. Another seven water bird species was recorded and those species are matched with another Ramsar criteria (1% of the flyway population) in Thahton and Paung Township area. The average number of small waders population is not different compared to last year record. However, the upper Gulf of Mottama habitat has changed during a year period and which made it difficult to cover the core area during the survey period of 2017. Due to the dynamic ecosystems of GoM, the shore bird habitats changed by time. So in order to ensure protection of unique biodiversity and sustainable livelihoods sector, the area, the entire Gulf of Mottama should be designated as Ramsar Site.

1. INTRODUCTION

1.1. Background

The Spoon-billed Sandpiper (*Calidris pygmaea*) is a long distance migrant, breeding in Russia and annually migrating more than 8,000 km to winter in South and South-east Asia, with approximately half of the global population is understood to be wintering in Myanmar and the large majority in the GOM. This species is classified as globally Critically Endangered in the IUCN Red List of Threatened Species. That is the highest category of extinction threat for any species still present in the wild. In 2010, it was assessed that at the current rate of population decline this species could become extinct within a decade. Myanmar is the most important country as a wintering ground for this species with about half of the global population recorded wintering in Gulf of Mottama and harboring another important wintering site in Nanthar Island of the coast of Rakhine State. The present of this species recorded at the Taninthayi coast and Delta are also the incoming indicators of important habitats for Spoon-billed Sandpiper and other migratory shore birds.

The Gulf of Mottama (Martaban) is located in Yangon Region, Bago Region and Mon State. It is a large and generally undisturbed funnel-shaped estuary with extensive tidal flats covering an area of about 250,000 ha. Its tidal cycle is extremely pronounced in speed and amplitude, causing a powerful bore phenomenon which is highly unusual in the region and which makes this, one of the most dynamic estuaries in the world, with constant sediment redistribution, channel-shifts, erosion and accretion on a large scale. The high productivity of the system supports a rich biota including abundant invertebrates, important nursery areas for marine fish and up to 150,000 migratory water birds in the non-breeding season. These include four globally threatened species and internationally important 19 species, and the Gulf serves as one of the world's most important wintering ground for the critically endangered Spoon-billed Sandpiper (CR), hosting probably more than half of the remaining global population. The tides and currents constantly redistribute sediments on a large scale, producing shifting channels and a mix of erosion and accretion, and making this one of the most dynamic estuaries in the world.

The biological productivity of this system supports a rich biota that exemplifies the importance of large estuaries on an international scale as source areas for fish and invertebrates and as non-breeding refuges for tens of thousands of migratory water birds. BANCA's previous studies (2008-2016) on the Gulf of Mottama clearly meet with the 6 out of 9 Ramsar Criteria and need to protect, important habitat of Spoon-billed Sandpiper global population.

2. Survey Methods

From October 2016 to March 2017, shore birds survey were conducted by BANCA team, Pyae Phyo Aung with support of ornithologists from the SBS TF and other international friends. The previous survey results were reviewed for data and potential sites which were identified with Landsat 8 from USGS and Google Earth. Survey by boat and count from a designated location by GPS, or along a route, number of each shorebird species present and recording threats on shore birds. The surveyors separated out across the mudflat during the ebb and each group of bird scanned with telescope and the number of species recorded. Also estimate was made for the total number of population of species in each flock. Bird list record includes sighting as well as sound and used binoculars and telescopes.

3. Team Member

BANCA monthly survey team member		
1	Pyae Phyo Aung	Program Manager
2	Saw Moses	Senior Ornithologist
3	Min Thiha Zaw	Program Assistant
4	Htet Phyo Naung	Program Assistant
5	Min Thein Htet	Junior Ornithologist
6	Aung Naing Oo	Site Based Staff

Flyways survey team member (January 2017)

No	Name	Organization
1	Christoph Zöckler	Spoon billed Sandpiper Task Force (SBS TF)
2	Elena Lappo	Bird Russia
3	Sayam Chowdhury	Spoon billed Sandpiper Task Force (SBS TF)
4	Tong Menxiu	China Wild Tour
5	Thattaya Bidayabha	Bird Conservation Society Thailand (BCST)
6	Suchart	Bird Conservation Society Thailand (BCST)
7	Karin Eberhardt	Freelance Consultant
8	Nigel Clark	British Trust Ornithology (BTO)
9	Chris Kelly	UK Support Group
10	Teresa Stehle	Biodiversity And Nature Conservation Association (BANCA)
11	Aaron Maizlish	Bird Conservation Fund
12	Hilger Lemke	German Support Group
13	Niyom Thongmuean	United Nation Development Program (UNDP)
14	Paul Insua Cao	Royal Society for the Protection of Bird (RSPB)
15	Wicha Narangsri	Thai Wetlands Foundation (TWF)
16	Phormporn Ponpinyo	Thai Wetlands Foundation (TWF)
17	Dong Koo Yun	East Asian- Australasian Flyways Partnership (EAAFP)
18	Tomoko Ichikawa	East Asian- Australasian Flyways Partnership (EAAFP)
19	Jonathan Slaight	Wildlife Conservation Society (WCS)
20	Minoru KASHIWAGI	Ramsar Network Japan (RNJ)
21	Rick Lanctot	US Fish & Wildlife
22	Ju Yung Ki	Chonbuk University
23	Pyae Phyo Aung	Biodiversity And Nature Conservation Association (BANCA)
24	Saw Moses	Biodiversity And Nature Conservation Association (BANCA)
25	Min Thiha Zaw	Biodiversity And Nature Conservation Association (BANCA)
26	Htet Phyo Naung	Biodiversity And Nature Conservation Association (BANCA)
27	Min Thein Htet	Biodiversity And Nature Conservation Association (BANCA)
28	Aung Naing Oo	Biodiversity And Nature Conservation Association (BANCA)

4. ITINERARY

No	Date	Activity
1	3 rd to 10 th October 2016	Survey in Core are of Gulf of Mottama
2	24 th to the 29 th of November 2016	Survey in Bilu Island (Southern Gulf of Mottama)
3	16 th to the 20 th of December 2016	Survey in Northern part of Gulf of Mottama
4	12 th to 20 th of January 2017	Flyway survey in Gulf of Mottama
5	17 th to the 22 nd of February 2017	Survey in Thahton and Paung Tsp
6	12 th to the 17 th of March 2017	Survey in west coast of Gulf of Mottama

5. RESULTS

5.1 Overview

Two types of survey results, flyways survey results (see Table 4) and small team results in each month and terrestrial bird list (Table 1,2,3,5,6 & Annex 1) According to flyways survey results, 40 wader species, 3 wildfowl species, 9 Gull and Tern species including new recorded **Indian skimmer (*Rynchops albicollis*)**, 10 water bird species and 6 raptors species. The total number of small wader population in the upper Gulf of Mottama area is over 82000 numbers including a minimum number 70 SBS.

5.2 Globally threatened Species

A total of three globally threatened species (CR,EN,VU) and ten near threatened species recorded, highlighting the significance of the Gulf of Mottama according the flyways survey results. Three globally threatened species are (**Spoon-billed Sandpiper(CR), Great Knot (EN) and Indian Skimmer (VU)**). Recorded six species are stalwartly associated with intertidal mudflats (**Black-headed Ibis, Black-tailed Godwit and Eurasian Curlew, Asian Dowitcher, Curlew Sandpiper and Red-necked Stint (all NT)**) and **Red-breasted Parakeet (NT)** in habitant of mangrove habitat.

6. Survey trip detailed

6.1 Survey in the core area at the Gulf of Mottama (3rd to 10th October 2016)

This is the first survey trip for 2016, to check the arrival of the small waders including the Spoon-billed Sandpiper. The team started survey on the 3rd October near Ko Tae Su mudflat and recorded over hundred number of waders , where the habitat is good for small waders. The team stayed overnight at the survey site. The next day the team surveyed at the Gar Thaung Auk location which is 5km away from Day 1. On that day, it started raining from morning 10 am to the evening ,the team recorded over 5000 Black-tailed godwits and few small waders. The habitat is mixed with mud and sand. In Day 3, the team survey at Kyaikhto Asin mudflat, 4km away from Day 2 location. The habitat is sandy mudflat with a thin layer of mud which is good habitat for small waders, this location is close to the main channel of Sittaung river. Next day, the team surveyed at Gar Thaung which is 11km away in the south. The habitat is good for small waders but didn't see small crab population at the mudflat and recorded few numbers of small waders. Day 5, the team moved to north near Day 2 survey location and recorded a single Spoon-billed Sandpiper without flag (N 17.19165 E96.94651). The team stayed overnight at the survey location and next day surveyed at the same location but didn't record Spoon-billed Sandpiper. The last day, the team surveyed near the first day's location and stayed overnight and back to Thein Ngu village.

6.2 Survey near the Bilu Island , 24th to the 29th of November 2016

During the second survey, the team left from Mawlamyine town at 10:00 am during the highest tide, arriving at Kalwe Village at 11:10 am. From there, the team immediately proceeded to Dayel village, and arrived at 11:30 am. The team stayed at Dayel Village

until 12:10pm and then headed to Dayel Village Island (N16.509417 E 97.494869) arriving at 2pm (N16.42831E97.44199) distance 12.9 km from the Dayel village. The team waited for low tide and began surveying at 4pm. During this time, a moderate number of small waders were observed. The presence of a thin layer of mud which is good habitat for small waders.

The team stayed overnight at this location before moving in the early morning to Apyine mudflat arriving at 6:10am. Surveys were not possible in this area, as it remained submerged in low tide. After waiting for high tide, the team left Apyine mudflat and headed to Zegone mudflat (12.1 km) south of first day surveyed location, arriving at 10:10am and immediately began surveys in the area. At this location, an approximate 290 small wader birds were recorded.

The team slept overnight on the boat at this location, left at 8:30am the next morning, arriving at Tawpon Village (north of Zegone mudflat) at 9:26am. Surveying began at 11:31am before the team stayed overnight at this location. Surveying results at near Tawpon Village mudflat identified approximately 450 small waders in the area, but recorded no Spoon-billed Sandpipers. The area has mangrove trees and the habitat is muddy and found large water birds.

Leaving Tawpon Village, the team arrived at Ahlat Village (north of Tawpon village) a distance of (19 km) at 1:30pm the next day. Surveys began immediately and recorded two Spoon-billed Sandpipers without flag (N: 16.51117 E 97.35708) and over 1500 small waders. The boats stayed at this location overnight, left Ahlat village at 8am and arrived at 'Army' Island, a distance 10 km from Ahlat, located north of Bilu island at 11:15am. Waiting for low tide, survey began at 2pm and recorded 2000 small waders. During the high tide at 5:30pm, the team left the island and arrived at Dayel creek at 5:50pm. Army Island has good mangrove forest and sandy mudflats. The team halted overnight at the creek, then the team moved in the morning to Dayel village where they began final survey at 8am. There were small roosting places for wader near the Dayel village and recorded about 1900 waders.



Fig 1: Survey team in the mudflat

6.3 Survey in the east coast of the Gulf of Mottama (Northern part), 16th to the 20th of December 2016

The third survey started from Thein Ngu Village at 8:30pm and arrived at Baung Kalar Island (N: 17.21244 E: 96.99016) at 10:20pm. The survey team halted overnight at this location and left at 6:05am the next morning.

Arrived at Lower Gar Island (N: 17.13089 E: 96.94381) which is 10 km distance to south of Baung Kalar at 9:00am and surveyed in the area (N: 17.13089 E: 96.94381) at 9:30am. During the survey, approximately 2,000 Black-tailed Godwits and over 4,000 other small waders were recorded. This area is muddy habitat. Staying overnight on the boat, the team departed at 6:55am, reaching Taung Gyi Pauk mudflat which is 10 km distance from Lower Gar island (N: 17.08842 E: 097.02809) at 9:15am. Surveying began immediately, where 3,500 small waders were recorded, except the Spoon-billed Sandpiper. The team surveyed again at 2:45pm, in a separate location at the island (N: 17.09273 E: 097.01806). Although the habitat was predicted to be good for small waders and with only a thin layer of mud, no Spoon-billed Sandpipers were recorded. This is likely due to the fact that the tide was far away from the survey site. It is also likely due to the increase of sand deposits on the island in recent years, allowing for greater dispersal of the shorebirds across the expansive habitat.

The team halted overnight at this location and left at 6:35am, arriving West Wae Pyan mudflat which is 4 km distance from Taung Gyi Pauk (N: 17. 17534 E: 096. 96277) at 8:00am. Surveying began at 8:45am (N: 17.15458 E: 096.97243) where only a small number of waders were recorded. The large number of small waders landed on Taung Gyi Pauk area in 2014-2015. During high tide at 9pm, the team moved to Baung Kalar Island, stayed overnight before making way back to Thein Ngu Village the next morning.

6.4 Survey in the core area of the Gulf of Mottama, 12th to 20th of January 2017

In January, a larger and more comprehensive survey was conducted by BANCA and SBSTF accompanied by 28 ornithologists (22 from international and 6 from Local). The survey team halted overnight at Koe Tae Su Village left at 5:30 am the next morning at high tide. The team arrived upper location(N: 17.189460 E: 96.960590) of the Lower Wae Pyan mudflat at 8:30am. On the way to first survey location point, one boat sank because the driver wanted to hurry and used two engines so the boat over-turned. The team arrived late to the survey location points and the survey started straight away where about 10000 small waders and 2 Spoon-billed Sandpiper (N 17.18946 E 96.96059) were recorded. During high tide at 4pm that afternoon, the survey team split into two groups to survey different locations. The first group moved to Lower Gar mudflat (N 17.123520 E 96.938810) and (N 17.005400 E 97.052930) which is 23.6 km to south of Bilin.

Team 1: The team member split in small teams and surveyed the mudflat, recorded two Spoon-billed Sandpipers at the Lower Gar mudflat and 5000 waders. one Indian skimmer was recorded which is the first record of GoM. On Day 2, the team recorded another 2 Spoon-billed Sandpipers. On Day 3, the team surveyed near west coast which is close to the main channel of the Sittaung river, recorded 60 Spoon-billed Sandpipers.

On Day 4, team moved to north near the west coast and there recorded 25 Spoon-billed Sandpiper. On Day 4, the team went back to Koe Tae Su village and head straight away to Mawlamyine for SBS TF workshop. The team carried out the survey near Ahlat village and on 19-20 January recorded one Spoon-billed Sandpiper.

Team 2: The team 2 also split in small teams and surveyed surrounding Taung Gyi mudflat area which is close to Thahton district area. On Day 2, the team recorded over 1300 small waders but no Spoon-billed Sandpiper at the location (N 17.005400 E 97.052930). On Day 3, the team surveyed in the north 10 km distance from Day 2 location and there recorded 4-5 Spoon-billed Sandpipers. The team 2 also carried out the survey at Bilu Island near Dayel village on the 19 January and no Spoon-billed Sandpiper was recorded.



Fig 2: Survey boats in the mudflat



Fig: 3 Flyways survey team members

6.5 Survey at Thahton and Paung townships in the Gulf of Mottama, 17th to the 22nd of February 2017

During the next survey in the Gulf of Mottama, the team departed Aung Kan Thar Village at 9pm and made way to Aung Kan Thar creek arriving at 10pm. The team, supported three days by Christoph Zöckler from the SBS TF, halted overnight at this location and departed at 7:00am, arriving Mayangone mudflat (N: 16.96813 E: 097.13330) at 9:30am. Birds of interest were four Avocets here.

Surveying in this location began at 10:56am. Although a moderate number of small waders were recorded, but no Spoon-billed Sandpipers were observed. Habitat in this location was not ideal for small waders and the habitat is sandy mudflat. During high tide, at 5:30pm, the boats moved to Shwe Hmone Ganan mudflat where the team halted overnight.

Surveying at this location began at 7am the next morning before the boats left again at high tide at 9:22am. The team relocated to Than Oo mudflat (N: 16.628000E: 97.277560) a distance of 16.3 km to south where the team arrived at 11:38am and began surveying immediately. Relatively few small waders and no Spoon-billed Sandpipers were recorded in this area. When high tide reached the boat at 4:57pm, the team moved to south 1.4 km way to Bylong Island (N: 16.61508 E: 97.29761) and halted overnight.

During high tide, the next morning at 9:30am, the team left Bylong mudflat and moved north 15km to Aung Myint Sein Creek (N: 16.77691 E: 97.2194). Surveying began at 10:30am directly after the team arrived. At this location, many small waders, mostly

plovers were identified, but no Spoon-billed Sandpiper were recorded. The boats stayed overnight at this location. Good habitat of mangrove forest stand along the way between Aung Myint Sein creek to Bylong mudflat.

The team left early the next morning and made way to Shwe Mhone mudflat (N: 16.82228 E: 097.18016). Surveys were conducted shortly after arrival; however no small waders were recorded. During high tide at 11:17am, the boats moved from this location, arriving at Saw Kae mudflat (N: 16.835380 E: 97.183830) at 11:33am. Surveys began at 12:30pm, during which few small waders but no Spoon-billed Sandpipers were identified. During high tide at 8:30pm, the boats made way back to Aung Kan Thar creek where and stayed overnight. Surveying began in this area at 7am, at this time only a few small waders were recorded with the majority of bird sightings being larger sized birds. During high tide at 12pm that day, the team moved back to Aung Kar Thar village and the survey came to an end.



Fig 4: 1 Mangrove forests between Thahton and Paung township

6.6 Survey in west coast of (Bago Region) of the Gulf of Mottama, 12th to the 17th of March 2017

The next survey for the 2016-2017 wintering period left Sar Ta Lin village (N: 16.76973 E: 096.76241) during high tide at 3:14am. Arrived at Than Za Gar mudflat which is 8 km north of Sar Ta Lin village (N: 16.80321 E: 96.8158) at 4:13am. Surveying in this area began at 7:00am where a moderate number of small waders were recorded. The mudflats in this area consisted of mixed sand and mud, as well as only sand habitat. During high tide at 2:14pm, the boats moved to Mon Tae Su Creek (N: 16.9193 E: 96.86023), arrived at 3:44pm and halted overnight.

During high tide at 3:13am, the boats moved to 11 km north of Ma Mauk mudflat (N: 17.03656 E: 096.85060) and arrived at 4:33am. In front of this location there is one big mudflat but the team couldn't pass the channel. On this day, the tide was very high and difficult to handle boats. At this location no small waders were observed, instead over 6,000 terns were identified. During high tide at 4:19pm, the team moved again, making way to Kyar Kyi mudflat (N: 16.97939 E: 096.88858). Arrived at the islands at 5:17pm the team halted overnight.

During surveys at 7:00am the next morning, many small waders but no Spoon-billed Sandpipers were identified. During high tide at 4:40pm the team moved to south 8km and stayed overnight. High tide reached the boats at 4:36am and the team moved to a different location (N: 16:78446 E: 096.83203), arriving at 5:33am. Surveying began at this location at 9:00am, and few small waders were recorded. During high tide the team completed the survey and moved back to Sar Ta Lin Village.

7. Threats to shore birds

7.1 Hunting

In each survey trip, the team checked hunting issues but didn't record in the Gulf of Mottama. There is no more hunting in the Gulf of Mottama according to the local fishers. But the team recorded the mist net at the Bilu Island during the survey in November 2016 near the Dayel village. The fishers said there were some bird hunting issues, where hunters come from Dayel village and some are from Paung Township. BANCA team went to Dayel village after the survey trip and met with the bird hunter and asked about the hunting information. One month later, the team provided alternative livelihoods for this bird hunter (fishing boat, engine and fishing gears) in Dayel village.



Fig 5: Mist net near Dayel village at Bilu Island

7.2 Sand mining

Two types (small scale and large scale). Small scale sand mining issues in Ahlat village at the roosting place of shore bird area. Many vessels could be seen in the Southern Gulf of Mottama, Mawlamyine and Thanlwin river mouth for large scale sand mining. The sand extraction is one of the impact for the river ecosystem and erosion which may impact the mudflat ecosystem.



Fig 6: Small scale sand mining at the waders roosting place in Ahlat village Mon State



Fig: 7 Sand mining vessel at Thanlwin river mouth

8. DISCUSSION

8.1 Importance of migratory shore birds and Ramsar Site designation status

The intertidal mudflats are highly productive ecosystems, providing food, habitat for biodiversity and regulation on the climate change. Over 82000 small waders population recorded during the flyway survey in the northern part of eastern Gulf of Mottama, definitely meet the criteria of Ramsar.

For the proposed southern extension of the Ramsar Site in Thahton and Paung townships, the surveys also obtained and assessed total numbers of waterbirds and the results of (2010-2017) show that the mudflat area in Thahton and Paung townships also fulfill of the Ramsar criteria of 20,000 water birds. Table 1: List of seven bird species matched with another Ramsar criteria (ie 1% of the flyway population). These are Kentish Plover (1.5%), White-winged Tern (2.1%) Spoon-billed Sandpiper (2%), Eurasian Curlew (1.2%), Black-tailed Godwit (1.3%), Black-headed Ibis (1.5%), Common Redshank (5.6%). Based on the 1% flyway population criteria alone, the southern Gulf of Mottama (Eastern site) is fully qualify as a designation of Ramsar Site.

Table 1: List of seven bird species matched with another Ramsar criteria (ie 1% of the flyway population)

No	Common Name	Scientific Name	Population Size	Period of pop.Est	% occurrence global population	IUCN RedList	CITIES Appendix I	CMS Appendix II
1	Kentish Plover	<i>Charadrius alexandrinus</i>	1500	2010-2017	1.5	LC		
2	White-winged Tern	<i>Chlidonias leucopterus</i>	10500	2010-2017	2.1	LC		
3	Spoon-billed Sandpiper	<i>Calidris pygmeus</i>	10	2010-2017	2	CR		X
4	Eurasian Curlew	<i>Numenius arquata</i>	1200	2010-2017	1.2	NT		
5	Black-tailed Godwit	<i>Limosa limosa</i>	1800	2010-2017	1.3	NT		
6	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	150	2010-2017	1.5	NT		
7	Common Redshank	<i>Tringa totanus</i>	5600	2010-2017	5.6	LC		

8.2 Importance of Mangrove habitat

Very rare in the entire Gulf of Mottama the habitat of Mangrove forest was found near Thanton, Paung and Yangon Region were recorded. These mangrove habitat are also important for other water birds and resident species Bilu Island of Chaungzone Township. These has good mangrove habitats harbor Red-breasted Parakeet and Rose-ringed Parakeet, of which the first is near-threatened (NT).

The habitat and food for shore birds

Upper Gulf of Mottama mudflats have changed in comparison with the previous year condition. Some new mudflat are born in the west coast near the main channel of Sittaung river. Due to heavy rains in monsoon season, the water salinity is 25 ppt in January 2017, less than 2ppt in comparison with the previous year. Also, the size of small crab are smaller.



Fig 8: mudflats in Gulf of Mottama



Fig 9: Grass land in the Gulf of Mottama



Fig 10: Tidal bore in the Gulf of Mottama

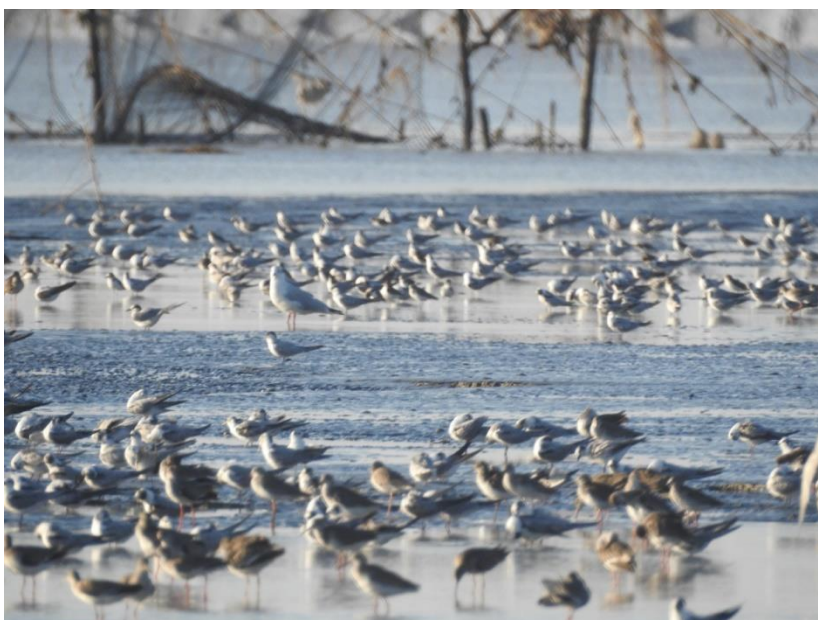


Fig 11: Flock of Terns and Common Redshanks



Fig 12: Flock of Painted Storks (25th November 2016)



**Fig 13: Flock of Black-headed Ibis
(25th November 2016 at Bilu island)**

9. RECOMMENDATIONS

- Gulf of Mottama is one of the important habitats for migratory shore birds in the world. Further more, Ramsar Site designation for Thahton and Paung townships areas should be carried out immediately in consultation with the community and State Government authorities.
- Its necessary to study benthos together with the bird survey team and develop a joint monitoring scheme.
- Surveys with more team members should be continued at least once a year, (flyways counts) in GoM (Yangon and Bago regions)
- In wintering season, regular monthly survey should be carried out in the Gulf of Mottama.
- To include different geographical condition, Bilu island mudflats area should be designated as Ramsar Site but with a different management point of view and designation.
- Provide intensive training for shore birds survey for the university researchers.

Table 1: Bird list of the core area in the Gulf of Mottama (3rd to 10th October 2016)

No.	Date		IUCN Status 2017 (ver 3.1)	3-10-16	4-10-16	5-10-16	6-10-16	7-10-16	8-10-16	9-10-16
	Approximate center of survey - Latitude			17.20871	17.12937	17.20414	17.12408	17.18616	17.18616	17.20891
	Approximate center of survey - Longitude			96.97886	96.93697	96.90038	96.95061	96.95095	96.95095	96.97900
	Survey units			1	2	3	4	5	6	7
	Common Name	Scientific Name								
1	Black-tailed Godwit	<i>Limosa limosa</i>	NT	16	5000	1500	900	75	206	55
2	Bar-tailed Godwit	<i>Limosa lapponica</i>	NT			1				
3	Whimbrel	<i>Numenius phaeopus</i>	LC				1	1	45	60
4	Eurasian Curlew	<i>Numenius arquata</i>	NT	183				1	36	40
5	Wood Sandpiper	<i>Tringa glareola</i>	LC				5			
6	Terek Sandpiper	<i>Xenus cinereus</i>	LC		3	8	4	7	4	30
7	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	11	2	4	10			
8	Ruddy Turnstone	<i>Arenaria interpres</i>	LC		6		2			
9	Spotted Redshank	<i>Tringa erythropus</i>	LC				1			
10	Common Redshank	<i>Tringa totanus</i>	LC					6	2	
11	Marsh Sandpiper	<i>Tringa stagnatilis</i>	LC			3				
12	Common Greenshank	<i>Tringa nebularia</i>	LC	4	10	29	3	90	29	24
13	Spoon-billed Sandpiper	<i>Calidris pygmeus</i>	CR					1		
14	Little Stint ²	<i>Calidris minuta</i>	LC	7	60	80			22	3
15	Red-necked Stint	<i>Calidris ruficollis</i>	NT		75		225	380		
16	Temminck's Stint	<i>Calidris temminckii</i>	LC	1						
17	Red Knot	<i>Calidris canutus</i>	NT		1	1				
18	Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	6	104	82	131	360	50	

No.	Date		IUCN	3-10-16	4-10-16	5-10-16	6-10-16	7-10-16	8-10-16	9-10-16
	Approximate center of survey - Latitude		Status 2017 (ver 3.1)	17.20871	17.12937	17.20414	17.12408	17.18616	17.18616	17.20891
	Approximate center of survey - Longitude			96.97886	96.93697	96.90038	96.95061	96.95095	96.95095	96.97900
	Survey units			1	2	3	4	5	6	7
19	Broad-billed Sandpiper	<i>Calidris falcinellus</i>	LC		16	1	88	3		
20	Black-winged Stilt	<i>Himantopus himantopus</i>	LC							1
21	Kentish Plover	<i>Charadrius alexandrinus</i>	LC	4	68	35	16	7	7	
22	Lesser Sand Plover	<i>Charadrius mongolus</i>	LC	21	338	196	640	250	111	12
23	Greater Sand Plover	<i>Charadrius leschenaultii</i>	LC	13	33	5	11	8	11	
24	Pacific Golden Plover	<i>Pluvialis fulva</i>	LC							2
25	Grey Plover	<i>Pluvialis squatarola</i>	LC				7		6	
	Total Waders			266	5716	1945	2044	1189	529	227
1	Black-headed Gull	<i>Larus ridibundus</i>	LC			1		1		
2	Pallas's Gull	<i>Larus ichthyaetus</i>	LC			1		1		
3	Heuglin's Gull	<i>Larus fuscus heuglini</i>				1				
4	Brown-headed Gull	<i>Larus brunnicephalus</i>	LC				2	1	1	
5	Gull-billed Tern	<i>Gelochelidon nilotica</i>	LC			1		7	3	
6	Caspian Tern	<i>Hydroprogne caspia</i>	LC				3		1	
7	Little Tern	<i>Sterna albifrons</i>	LC	5		5	7	5	5	2
8	Whiskered Tern	<i>Chlidonias hybrida</i>	LC	87	10			300	120	120
9	White-winged Tern	<i>Chlidonias leucopterus</i>	LC	10	87			350	150	150
10	Whiskered/White-winged Tern					1750	380			
	Total Gulls and Terns			102	97	1759	392	665	280	272
1	Little Egret	<i>Egretta garzetta</i>	LC	10	10	3	4		3	9

No.	Date		IUCN	3-10-16	4-10-16	5-10-16	6-10-16	7-10-16	8-10-16	9-10-16
	Approximate center of survey - Latitude		Status 2017 (ver 3.1)	17.20871	17.12937	17.20414	17.12408	17.18616	17.18616	17.20891
	Approximate center of survey - Longitude			96.97886	96.93697	96.90038	96.95061	96.95095	96.95095	96.97900
	Survey units			1	2	3	4	5	6	7
2	Grey Heron	<i>Ardea cinerea</i>	LC	1			3	2	6	2
3	Great Egret	<i>Ardea alba</i>	LC	6	2	2	5		2	2
4	Eastern Cattle Egret	<i>Bubulcus ibis</i>	LC	5					7	
5	Yellow Bittern	<i>Ixobrychus sinensis</i>	LC	3						
6	Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	LC	1						
7	Intermediate Egret	<i>Ardea intermedia</i>	LC		7	3			2	3
8	Glossy Ibis	<i>Plegadis falcinellus</i>	LC				600			
9	Spot-billed Palican	<i>Pelecanus philippensis</i>	NT		1					
10	Pond Heron spp.	<i>Ardeola sp</i>	LC	5	2	2	3		3	5
11	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC		1				5	
12	Painted Stork	<i>Mycteria leucocephala</i>	NT		2	36	3	12	7	2
	Total other dependent waterbirds			31	25	46	618	14	35	23
1	Eastern Marsh Harrier	<i>Circus spilonotus</i>	LC				1	2	2	
2	Pied Harrier	<i>Circus melanoleucos</i>	LC	5		3	2	1	3	2
	Total raptors			5	0	3	3	3	5	2
1	Black Kite	<i>Milvus migrans</i>	LC							3
2	Little Cormorant	<i>Microcarbo niger</i>	LC							7
	Total wetland dependent species			0	0	0	0	0	0	10

CR = Critically Endangered, EN = Endangered, NT = Near Threatened, VU = Vulnerable, LC = Least Concern

Table 2: Bird list of Bilu Island , 24th to the 29th of November 2016

No	Date		IUCN	24-11-16	25-11-16	26-11-16	27-11-16	27-11-16	28-11-16	29-11-16	30-11-16
	Approximate center of survey - Latitude		Status 2017 (ver 3.1)	16.42831	16.32562	16.36114	16.36114	16.50406	16.50531	16.42831	On the way to Mawlamyine
	Approximate center of survey - Longitude			97.44199	97.45987	97.47076	97.47076	97.37180	97.45929	97.44199	
	Survey units			1	2	3	4	5	6	7	8
	Common Name	<i>Scientific Name</i>									
1	Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	2	2	13	27				
2	Whimbrel	<i>Numenius phaeopus</i>	LC	77	27	120	120		60	50	
3	Eurasian Curlew	<i>Numenius arquata</i>	NT	23	35	179	170		40	30	10
4	Ruff	<i>Calidris pugnax</i>	LC			1					
5	Terek Sandpiper	<i>Xenus cinereus</i>	LC	6	3			1	1		
6	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	23	12	18	2	19	40	40	25
7	Common Redshank	<i>Tringa totanus</i>	LC	85	13	30	35	380	30	21	5
8	Sanderling	<i>Calidris alba</i>	LC		3			4	1		
9	Little Stint ²	<i>Calidris minuta</i>	LC	3	16	2		4	25	4	
10	Spoon-billed Sandpiper	<i>Calidris pygmeus</i>	CR				2				
11	Red-necked Stint	<i>Calidris ruficollis</i>	NT					3	1		
12	Long-toed Stint	<i>Calidris subminuta</i>	LC					2			
13	Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	1				2	4	3	
14	Little Ringed Plover	<i>Charadrius dubius</i>	LC		7	13	5				
15	Kentish Plover	<i>Charadrius alexandrinus</i>	LC	80	95	4	4	520	800	25	
16	Lesser Sand Plover	<i>Charadrius mongolus</i>	LC	180	60	10	13	340	900	25	9
17	Greater Sand Plover	<i>Charadrius leschenaultii</i>	LC	70	3	14		280	10	3	
18	Pacific Golden Plover	<i>Pluvialis fulva</i>	LC		7	25	25		5	2	
19	Grey Plover	<i>Pluvialis squatarola</i>	LC	1		27	33				
	Total Waders			551	283	456	436	1555	1917	203	49
1	Lesser Whistling-Duck	<i>Dendrocygna javanica</i>	LC						14		
	Total Wildfowl								14		
1	Black-headed Gull	<i>Larus ridibundus</i>	LC							1	
2	Pallas's Gull	<i>Larus ichthyæetus</i>	LC	2	15		1				
3	Brown-headed Gull	<i>Larus brunnicephalus</i>	LC	40	35	41	15	280	25	56	40
4	Gull-billed Tern	<i>Gelochelidon nilotica</i>	LC					3			

No	Date		IUCN	24-11-16	25-11-16	26-11-16	27-11-16	27-11-16	28-11-16	29-11-16	30-11-16
	Approximate center of survey - Latitude		Status 2017 (ver 3.1)	16.42831	16.32562	16.36114	16.36114	16.50406	16.50531	16.42831	On the way to Mawlamyine
	Approximate center of survey - Longitude			97.44199	97.45987	97.47076	97.47076	97.37180	97.45929	97.44199	
	Survey units			1	2	3	4	5	6	7	8
5	Caspian Tern	<i>Hydroprogne caspia</i>	LC				1				
6	Whiskered Tern	<i>Chlidonias hybrida</i>	LC	3	17	10	30	750			
7	White-winged Tern	<i>Chlidonias leucopterus</i>	LC	35	48	10	15	500			
	Total Gulls and Terns			80	115	61	62	1533	25	57	40
1	Little Egret	<i>Egretta garzetta</i>	LC	45	70	158	158	10	18	13	
2	Grey Heron	<i>Ardea cinerea</i>	LC	1	9	5	3	3	4	2	
3	Great Egret	<i>Ardea alba</i>	LC	120	130	7		6	12	7	
4	Intermediate Egret	<i>Ardea intermedia</i>	LC	4		104	104				
5	Eastern Cattle Egret	<i>Bubulcus ibis</i>	LC								36
6	Pond Heron spp.	<i>Ardeola sp</i>	LC	3	65	120	150	40	121	111	
7	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	10	12	10		12	6		
8	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	37	8	121	169				
9	Painted Stork	<i>Mycteria leucocephala</i>	NT							120	
	Total other dependent waterbirds			220	294	525	584	71	161	253	36
1	Peregrine Falcon	<i>Falco peregrinus</i>	LC	1		2					
	Total raptors			1	0	2	0	0	0	0	0
1	Little Cormorant	<i>Microcarbo niger</i>	LC	6	16	4			1		
2	White-breasted Water hen	<i>Amaurornis phoenicurus</i>	LC								1
3	Ruddy-breasted Crake	<i>Zapornia fusca</i>	LC		2						
	Total wetland dependent species			6	18	4	0	0	1	0	1

Table 3: Bird list in the east coast of the Gulf of Mottama (Northern part), 16th to the 20th of December 2016

No	Date		IUCN Status 2017 (Ver 3.1)	17-12-16	18-12-16	19-12-16	20-12-16
	Approximate center of survey - Latitude			17.13089	17.08840	17.17534	17.21244
	Approximate center of survey - Longitude			96.94381	97.02810	96.96272	96.99016
	Survey units			1	2	3	4
	Common Name	Scientific Name					
1	Common Snipe	<i>Gallinago gallinago</i>	LC			1	
2	Black-tailed Godwit	<i>Limosa limosa</i>	NT	2000	2500	320	
3	Bar-tailed Godwit	<i>Limosa lapponica</i>	NT			4	
4	Whimbrel	<i>Numenius phaeopus</i>	LC	113	89	630	6
5	Eurasian Curlew	<i>Numenius arquata</i>	NT	61	164	190	
6	Green Sandpiper	<i>Tringa ochropus</i>	LC				1
7	Terek Sandpiper	<i>Xenus cinereus</i>	LC	3	6		
8	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	3	3	16	12
9	Common Redshank	<i>Tringa totanus</i>	LC	266	70	190	12
10	Marsh Sandpiper	<i>Tringa stagnatilis</i>	LC		56	7	4
11	Common Greenshank	<i>Tringa nebularia</i>	LC	3	5	9	
12	Sanderling	<i>Calidris alba</i>	LC	1			
13	Little Stint ²	<i>Calidris minuta</i>	LC	200	312	75	
14	Red-necked Stint	<i>Calidris ruficollis</i>	NT	104	220	4	
15	Temminck's Stint	<i>Calidris temminckii</i>	LC				3
16	Red Knot	<i>Calidris canutus</i>	NT	1			
17	Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	260	430	16	
18	Broad-billed Sandpiper	<i>Calidris falcinellus</i>	LC	258	495		
19	Little Ringed Plover	<i>Charadrius dubius</i>	LC	2			3
20	Kentish Plover	<i>Charadrius alexandrinus</i>	LC	238	1000	60	4

No	Date		IUCN Status 2017 (Ver 3.1)	17-12-16	18-12-16	19-12-16	20-12-16
	Approximate center of survey - Latitude			17.13089	17.08840	17.17534	17.21244
	Approximate center of survey - Longitude			96.94381	97.02810	96.96272	96.99016
	Survey units			1	2	3	4
21	Lesser Sand Plover	<i>Charadrius mongolus</i>	LC	2428	2300	8	2
22	Greater Sand Plover	<i>Charadrius leschenaultii</i>	LC	329	230		
23	Pacific Golden Plover	<i>Pluvialis fulva</i>	LC	2		20	
24	Grey Plover	<i>Pluvialis squatarola</i>	LC			1	
	Total Waders			6272	7880	1551	47
1	Lesser Whistling Duck	<i>Dendrocygna javanica</i>	LC			45	
	Total Wildfowl			0	0	45	0
1	Black-headed Gull	<i>Larus brunnicephalus</i>	LC				1
2	Pallas's Gull	<i>Larus ichthyaetus</i>	LC	5	6	4	
3	Brown-headed Gull	<i>Larus brunnicephalus</i>	LC	240	190	270	
4	Gull-billed Tern	<i>Gelochelidon nilotica</i>	LC		4	8	
5	Caspian Tern	<i>Hydroprogne caspia</i>	LC		7	2	
6	Little Tern	<i>Sterna albifrons</i>	LC			4	
7	Whiskered Tern	<i>Chlidonias hybrida</i>	LC	585	260	950	50
8	White-winged Tern	<i>Chlidonias leucopterus</i>	LC	300	200	960	10
	Total Gulls and Terns			1130	667	2198	61
1	Little Egret	<i>Egretta garzetta</i>	LC		120	65	39
2	Grey Heron	<i>Ardea cinerea</i>	LC	5	20	6	2
3	Great Egret	<i>Ardea alba</i>	LC	10	120	21	16
4	Purple Heron	<i>Ardea purpurea</i>	LC				
5	Cattle Egret	<i>Bubulcus ibis</i>	LC				24
6	Intermediate Egret	<i>Ardea intermedia</i>	LC		26		
7	Pond Heron spp.	<i>Ardeola sp</i>	LC	5	45		1

No	Date		IUCN Status 2017 (Ver 3.1)	17-12-16	18-12-16	19-12-16	20-12-16
	Approximate center of survey - Latitude			17.13089	17.08840	17.17534	17.21244
	Approximate center of survey - Longitude			96.94381	97.02810	96.96272	96.99016
	Survey units			1	2	3	4
8	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	11		5	
9	Glossy Ibis	<i>Plegadis falcinellus</i>	LC				
10	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	1	20		
11	Painted Stork	<i>Mycteria leucocephala</i>	NT	2	16	14	
12	Asian Openbill	<i>Anastomus oscitans</i>	LC				3
	Total other dependent waterbirds			34	367	111	85
1	Peregrine Falcon	<i>Falco peregrinus</i>	LC	1	1		
2	Common Kestrel	<i>Falco tinnunculus</i>	LC	1			
3	Pied Harrier	<i>Circus melanoleucos</i>	LC		3	2	1
4	Black Shower Kite	<i>Elanus caerules</i>	LC				1
5	Black-eared Kite	<i>Milvus lineatus</i>	LC				4
	Total raptors			2	4	2	6
1	Little Cormorant	<i>Microcarbo niger</i>	LC				5
2	Creak	<i>Porzana spp</i>	LC				1
	Total wetland dependent species						6

Table: 4 Bird list of flyway survey in January 2017 (Northern Part of Mottama)

No	Date			13-1-17	14-1-17	15-1-17	16-1-17	17-1-17	14-1-17	15-1-17			
	Approximate center of survey – Latitude		IUCN Status (2017) ver 3.1	17.18946	17.12352	17.16879	17.15597	boat trip in	17.00540	17.09163	Total count 2017	Total count 2016	Total count 2015
	Approximate center of survey – Longitude			96.96059	96.93881	96.88225	96.88806	Areas not covered in survey	97.05293	97.02757			
	Survey units			1	2	3	4	5	6	7			
	Common Name	Scientific Name											
1	Pintail Snipe	<i>Gallinago stenura</i>	LC										
2	Common Snipe	<i>Gallinago gallinago</i>	LC	1							1		3
3	Black-tailed Godwit	<i>Limosa limosa</i>	NT	700	500	3500	1000	200	330	800	7030	8588	6000
4	Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	3	2	0	6				11	236	4
5	Whimbrel	<i>Numenius phaeopus</i>	LC	350	50	30	30		80		540	343	25
6	Eurasian Curlew	<i>Numenius arquata</i>	NT	80	70	8	0	8	50	50	266	941	159
7	Ruff	<i>Calidris pugnax</i>	LC	2	1	173	75		1		252	14	46
8	Green Sandpiper	<i>Tringa ochropus</i>	LC								0	2	3
9	Wood Sandpiper	<i>Tringa glareola</i>	LC	1							1	23	10
10	Terek Sandpiper	<i>Xenus cinereus</i>	LC	2		5	5			10	22	10	23
11	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	8	3			2	3		16	49	22
12	Ruddy Turnstone	<i>Arenaria interpres</i>	LC								0		1
13	Asiatic Dowitcher	<i>Limnodromus semipalmatus</i>	NT	1							1		1
14	Grey Tailed Tatler	<i>Tringa brevipes</i>	NT			1					1		
15	Spotted Redshank	<i>Tringa erythropus</i>	LC	15		1	4			5	25	119	117
16	Common Redshank	<i>Tringa totanus</i>	LC	1000	260	100	157		3	200	1720	3385	1350
17	Marsh Sandpiper	<i>Tringa stagnatilis</i>	LC	15	22	50	85			50	222	555	99
18	Common Greenshank	<i>Tringa nebularia</i>	LC	173	50	25	25		8	20	301	453	120
19	Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	LC								0		0
20	Sanderling	<i>Calidris alba</i>	LC						1		1	1	3

No	Date			13-1-17	14-1-17	15-1-17	16-1-17	17-1-17	14-1-17	15-1-17			
	Approximate center of survey – Latitude		IUCN Status (2017) ver 3.1	17.18946	17.12352	17.16879	17.15597	boat trip in	17.00540	17.09163	Total count 2017	Total count 2016	Total count 2015
	Approximate center of survey – Longitude			96.96059	96.93881	96.88225	96.88806	Areas not covered in survey	97.05293	97.02757			
	Survey units			1	2	3	4	5	6	7			
21	Spoon-billed Sandpiper	<i>Calidris pygmeus</i>	CR	2	2	60	25			4 or 5	89	100	154
22	Little Stint ²	<i>Calidris minuta</i>	LC		1						1	7	1
23	Red-necked Stint	<i>Calidris ruficollis</i>	NT	250		2500			30	500	3280	10792	7022
24	Temminck's Stint	<i>Calidris temminckii</i>	LC					13			13	41	30
25	Long-toed Stint	<i>Calidris subminuta</i>	LC	3		9	7		5		24	11	3
26	Great Knot	<i>Calidris tenuirostris</i>	EN		1				2		3	52	34
27	Red Knot	<i>Calidris canutus</i>	NT		6	3					9	1	1
28	Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	250		2000				300	2550	9013	8340
29	Broad-billed Sandpiper	<i>Calidris falcinellus</i>	LC	85		1000	4000		1	2500	7586	3409	4878
30	Small Pratincole	<i>Glareola lactea</i>	LC		4						4		
31	Oriental Pratincole	<i>Glareola maldivarum</i>	LC								0	2	
32	Black-winged Stilt	<i>Himantopus himantopus</i>	LC								0		
33	Pied Avocet	<i>Recurvirostra avosetta</i>	LC								0		
34	Common Ringed Plover	<i>Charadrius hiaticula</i>	LC	20	1						21		
35	Little Ringed Plover	<i>Charadrius dubius</i>	LC	70	2			40	15		127	810	?
36	Kentish Plover	<i>Charadrius alexandrinus</i>	LC	1500		5000	5000	300		6000	17800	14648	18258
37	Lesser Sand Plover	<i>Charadrius mongolus</i>	LC	1000		3000	12500	2500		4000	23000	24461	25171
38	Greater Sand Plover	<i>Charadrius leschenaultii</i>	LC	320		500	?		5	1000	1825	26	177
39	Pacific Golden Plover	<i>Pluvialis fulva</i>	LC	80	100	1000	100		4		1284	2834	1770
40	Grey Plover	<i>Pluvialis squatarola</i>	LC	31	1	3	16		1		52	71	14
	Total Waders			5962	1076	18968	23035	3063	539	15435	68078		
	Estimated total small			10000	5000	21000	28000	2840	1400	14300	82540	80997	73839

No	Date			13-1-17	14-1-17	15-1-17	16-1-17	17-1-17	14-1-17	15-1-17			
	Approximate center of survey – Latitude		IUCN Status (2017) ver 3.1	17.18946	17.12352	17.16879	17.15597	boat trip in	17.00540	17.09163	Total count 2017	Total count 2016	Total count 2015
	Approximate center of survey – Longitude			96.96059	96.93881	96.88225	96.88806	Areas not covered in survey	97.05293	97.02757			
	Survey units			1	2	3	4	5	6	7			
	waders (includes unidentified spp)												
1	Common Shelduck	<i>Tadorna tadorna</i>	LC				5						
2	Pintail		LC			2							3
	Total Wildfowl			0	0	2	5	0	0	0	7	0	3
1	Black-headed Gull	<i>Larus ridibundus</i>	LC		1				40			1	
2	Pallas's Gull	<i>Larus ichthyaetus</i>	LC	20	15	2	5		50			338	410
3	Brown-headed Gull	<i>Larus brunnicephalus</i>	LC	500	20	210	60	250				1443	480
4	Gull-billed Tern	<i>Gelochelidon nilotica</i>	LC	9	2	2	2		1			21	13
5	Caspian Tern	<i>Hydroprogne caspia</i>	LC		1		3	1	2			15	3
6	Little Tern	<i>Sterna albifrons</i>	LC	15	25	25	15					88	17
7	Whiskered Tern	<i>Chlidonias hybrida</i>	LC									565	
8	White-winged Tern	<i>Chlidonias leucopterus</i>	LC									1350	
9	Indian skimmer	<i>Rynchops albigollis</i>	VU		1								
10	Whiskered/White-winged Tern			5000	1000	14000	1000	200	3000	8000	32200	18850	14400
	Total Gulls and Terns			5544	1065	14239	1085	451	3093	8000	33477	22671	15323
1	Little Egret	<i>Egretta garzetta</i>	LC		10	2	2		10			115	87
2	Grey Heron	<i>Ardea cinerea</i>	LC	5	3	14	14		6	5		164	86
3	Great White Egret	<i>Ardea alba</i>	LC	5	6	1	4	50	70	15		330	68
4	Pacific reef Egret	<i>Egretta sacra</i>	LC										1
5	Intermediate Egret	<i>Ardea intermedia</i>	LC	3								24	5
6	Pond Heron spp.	<i>Ardeola sp</i>	LC						4			10	27
7	Black-crowned Night	<i>Nycticorax nycticorax</i>	LC		1	1	1					12	

No	Date			13-1-17	14-1-17	15-1-17	16-1-17	17-1-17	14-1-17	15-1-17			
	Approximate center of survey – Latitude		IUCN Status (2017) ver 3.1	17.18946	17.12352	17.16879	17.15597	boat trip in	17.00540	17.09163	Total count 2017	Total count 2016	Total count 2015
	Approximate center of survey – Longitude			96.96059	96.93881	96.88225	96.88806	Areas not covered in survey	97.05293	97.02757			
	Survey units			1	2	3	4	5	6	7			
	Heron												
8	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT			13	59		35	21		163	20
9	Painted Stork	<i>Mycteria leucocephala</i>	NT	4		2	3					5	13
10	Asian Open bill	<i>Anastomus oscitans</i>	LC										30
	Total other dependent waterbirds			17	20	33	83	50	125	41	369	823	337
1	Peregrine Falcon	<i>Falco peregrinus</i>	LC			1	1	0		0		3	
2	Common kestrel	<i>Falco tinnunculus</i>	LC									1	
3	Osprey	<i>Pandion haliaetus</i>	LC			1							
4	Black Kite	<i>Milvus migrans</i>	LC			1							
5	Eastern Marsh Harrier	<i>Circus spilonotus</i>	LC	1	1		1		2			119	36
6	Pied Harrier	<i>Circus melanoleucos</i>	LC									2	
	Total raptors			1	1	3	2	0	2	0	9	125	36
	Total wetland dependant species										116402	104616	89538

Table 5: Bird list of Thahton and Paung townships in the Gulf of Mottama, 17th to the 22nd of February 2017

No	Date		IUCN Status (2017)	17-2-17	18-2-17	19-2-17	19-2-17	20-2-17	21-2-17	21-2-17	22-2-17
	Approximate center of survey - Latitude			16.87526	16.96811	16.88483	16.62800	16.77691	16.82228	16.83538	16.86581
	Approximate center of survey - Longitude		ver 3.1	97.23456	97.13329	97.19081	97.27756	97.21940	97.18015	97.18383	97.20811
	Survey units			1	2	3	4	5	6	7	8
	Common Name	Scientific Name									
1	Black-tailed Godwit	<i>Limosa limosa</i>	NT		600	54	850	305			8
2	Whimbrel	<i>Numenius phaeopus</i>	LC		340	80	1	15	31	27	36
3	Eurasian Curlew	<i>Numenius arquata</i>	NT	1	400	35	180	304	120	51	103
4	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	1	5				1	3	50
5	Common Redshank	<i>Tringa totanus</i>	LC		1200	1000	5	1100	800	139	1000
6	Marsh Sandpiper	<i>Tringa stagnatilis</i>	LC	1	9					1	11
7	Common Greenshank	<i>Tringa nebularia</i>	LC		40		22	76	1	33	27
8	Little Stint ²	<i>Calidris minuta</i>	LC		1			26			17
9	Red-necked Stint	<i>Calidris ruficollis</i>	NT								4
10	Curlew Sandpiper	<i>Calidris ferruginea</i>	NT		3		1	7			
11	Broad-billed Sandpiper	<i>Calidris falcinellus</i>	LC					9			
12	Black-winged Stilt	<i>Himantopus himantopus</i>	LC		3						
13	Pied Avocet	<i>Recurvirostra avosetta</i>	LC			4					
14	Common Ringed Plover	<i>Charadrius hiaticula</i>	LC			50			1		
15	Little Ringed Plover	<i>Charadrius dubius</i>	LC	1	2		4		20	5	105
16	Kentish Plover	<i>Charadrius alexandrinus</i>	LC		1000	1	67	436			3
17	Lesser Sand Plover	<i>Charadrius mongolus</i>	LC		300		20	350			
18	Greater Sand Plover	<i>Charadrius leschenaultii</i>	LC		7		150	350			
19	Pacific Golden Plover	<i>Pluvialis fulva</i>	LC		1		15			20	

No	Date		IUCN	17-2-17	18-2-17	19-2-17	19-2-17	20-2-17	21-2-17	21-2-17	22-2-17
	Approximate center of survey - Latitude		Status (2017) ver 3.1	16.87526	16.96811	16.88483	16.62800	16.77691	16.82228	16.83538	16.86581
	Approximate center of survey - Longitude			97.23456	97.13329	97.19081	97.27756	97.21940	97.18015	97.18383	97.20811
	Survey units			1	2	3	4	5	6	7	8
20	Grey Plover	<i>Pluvialis squatarola</i>	LC		7			30		15	
	Total Waders			4	3918	1224	1315	3008	974	294	1364
1	Ruddy Shelduck	<i>Tadorna ferruginea</i>	LC	62							250
	Total Wildfowl			62							250
1	Black-headed Gull	<i>Larus ridibundus</i>	LC			55					
2	Pallas's Gull	<i>Larus ichthyaetus</i>	LC		28				7	60	1
3	Brown-headed Gull	<i>Larus brunnicephalus</i>	LC		270	50	16		10	10	26
4	Gull-billed Tern	<i>Gelochelidon nilotica</i>	LC		50			7			
5	Caspian Tern	<i>Hydroprogne caspia</i>	LC		1				3	98	
6	Little Tern	<i>Sterna albifrons</i>	LC		100						
7	Whiskered Tern	<i>Chlidonias hybrida</i>	LC	60	400		5	300	200	300	
8	White-winged Tern	<i>Chlidonias leucopterus</i>	LC		5000		600	1500	1500	800	114
9	Whiskered/White-winged Tern					200			1720		150
	Total Gulls and Terns			60	5849	305	621	1807	3440	1268	291
1	Little Egret	<i>Egretta garzetta</i>	LC		2	5	4	23		4	12
2	Grey Heron	<i>Ardea cinerea</i>	LC	2	50	25		18	5	8	29
3	Great Egret	<i>Ardea alba</i>	LC	5	20		58	226	2	9	14
4	Purple Heron	<i>Ardea purpurea</i>	LC				14	1		2	3
5	Intermediate Egret	<i>Ardea intermedia</i>	LC	1	30	6	272	29		3	16
6	Pond Heron spp.	<i>Ardeola sp</i>	LC	20			16	5			46
7	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	1				5		4	
8	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT		1	4	12	26			18

No	Date		IUCN	17-2-17	18-2-17	19-2-17	19-2-17	20-2-17	21-2-17	21-2-17	22-2-17
	Approximate center of survey - Latitude		Status (2017) ver 3.1	16.87526	16.96811	16.88483	16.62800	16.77691	16.82228	16.83538	16.86581
	Approximate center of survey - Longitude			97.23456	97.13329	97.19081	97.27756	97.21940	97.18015	97.18383	97.20811
	Survey units			1	2	3	4	5	6	7	8
	Total other dependent waterbirds			29	103	40	376	333	7	30	138
1	Eastern Marsh Harrier	<i>Circus spilonotus</i>	LC	1	3						
2	Pied Harrier	<i>Circus melanoleucos</i>	LC								1
	Total raptors			1	3	0	0	0	0	0	1

Table 6: Bird list of west coast (Bago Region) in the Gulf of Mottama, 12th to the 17th of March 2017

No	Date		IUCN Status (2017) ver 3.1	12-3-17	13-3-17	14-3-17	15-3-17
	Approximate center of survey - Latitude			16.80319	17.03656	16.97936	16.78446
	Approximate center of survey - Longitude			96.81579	96.85060	96.83203	96.83203
	Survey units			1	2	3	4
	Common Name	Scientific Name					
1	Black-tailed Godwit	<i>Limosa limosa</i>	NT			2	
2	Bar-tailed Godwit	<i>Limosa lapponica</i>	NT			4	
3	Whimbrel	<i>Numenius phaeopus</i>	LC	61	25	110	
4	Eurasian Curlew	<i>Numenius arquata</i>	NT	150	15	60	70
5	Terek Sandpiper	<i>Xenus cinereus</i>	LC			133	
6	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	2	20	80	
7	Ruddy Turnstone	<i>Arenaria interpres</i>	LC				
8	Common Redshank	<i>Tringa totanus</i>	LC	35	50	140	58
9	Marsh Sandpiper	<i>Tringa stagnatilis</i>	LC			2	7
10	Common Greenshank	<i>Tringa totanus</i>	LC	3		6	
11	Little Stint ²	<i>Calidris minuta</i>	LC	4			
12	Great Knot	<i>Calidris tenuirostris</i>	EN			2	
13	Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	28		4	
14	Broad-billed Sandpiper	<i>Calidris falcinellus</i>	LC			3	
15	Oriental Pratincole	<i>Glareola maldivarum</i>	LC			4	
16	Little Ringed Plover	<i>Charadrius dubius</i>	LC	1	1	100	
17	Kentish Plover	<i>Charadrius alexandrinus</i>	LC	101		3	7
18	Lesser Sand Plover	<i>Charadrius mongolus</i>	LC	78		650	9
19	Greater Sand Plover	<i>Charadrius leschenaultii</i>	LC	27		50	2
20	Pacific Golden Plover	<i>Pluvialis fulva</i>	LC	2	35	20	

No	Date		IUCN	12-3-17	13-3-17	14-3-17	15-3-17
	Approximate center of survey - Latitude		Status (2017)	16.80319	17.03656	16.97936	16.78446
	Approximate center of survey - Longitude		ver 3.1	96.81579	96.85060	96.83203	96.83203
	Survey units			1	2	3	4
21	Grey Plover	<i>Pluvialis squatarola</i>	LC			70	8
	Total Waders			492	146	1443	161
1	Ruddy Shelduck	<i>Tadorna ferruginea</i>	LC		9		
	Total Wildfowl				9		
1	Pallas's Gull	<i>Larus ichthyaetus</i>	LC		1	39	32
2	Brown-headed Gull	<i>Larus brunnicephalus</i>	LC	25	15	45	171
3	Gull-billed Tern	<i>Gelochelidon nilotica</i>	LC				
4	Caspian Tern	<i>Hydroprogne caspia</i>	LC			9	12
5	Whiskered Tern	<i>Chlidonias hybrida</i>	LC	1	6000	150	
6	Whiskered/White-winged Tern			750		5500	
	Total Gulls and Terns			776	6016	5743	215
1	Little Egret	<i>Egretta garzetta</i>	LC	4	20	11	25
2	Grey Heron	<i>Ardea cinerea</i>	LC	15	3	10	9
3	Great Egret	<i>Ardea alba</i>	LC	42	6	2	2
4	Purple Heron	<i>Ardea purpurea</i>	LC	5			
5	Intermediate Egret	<i>Ardea intermedia</i>	LC	40	10		6
6	Cattle Egret	<i>Bubulcus ibis</i>	LC		1		
7	Pond Heron spp.	<i>Ardeola sp</i>	LC		25	9	
8	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	65			
9	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	7	85		11
10	Painted Stork	<i>Mycteria leucocephala</i>	NT	30			
	Total other dependent			208	150	32	53

No	Date		IUCN Status (2017) ver 3.1	12-3-17	13-3-17	14-3-17	15-3-17
	Approximate center of survey - Latitude			16.80319	17.03656	16.97936	16.78446
	Approximate center of survey - Longitude			96.81579	96.85060	96.83203	96.83203
	Survey units			1	2	3	4
	waterbirds						
1	Peregrine Falcon	<i>Falco peregrinus</i>	LC	1			1
2	Eastern Marsh Harrier	<i>Circus spilonotus</i>	LC	10	1	1	1
3	Pied Harrier	<i>Circus melanoleucos</i>	LC	3			1
	Total raptors			14	1	1	3
1	Little Cormorant	<i>Microcarbo niger</i>	LC	1			
	Total wetland dependent species			1			

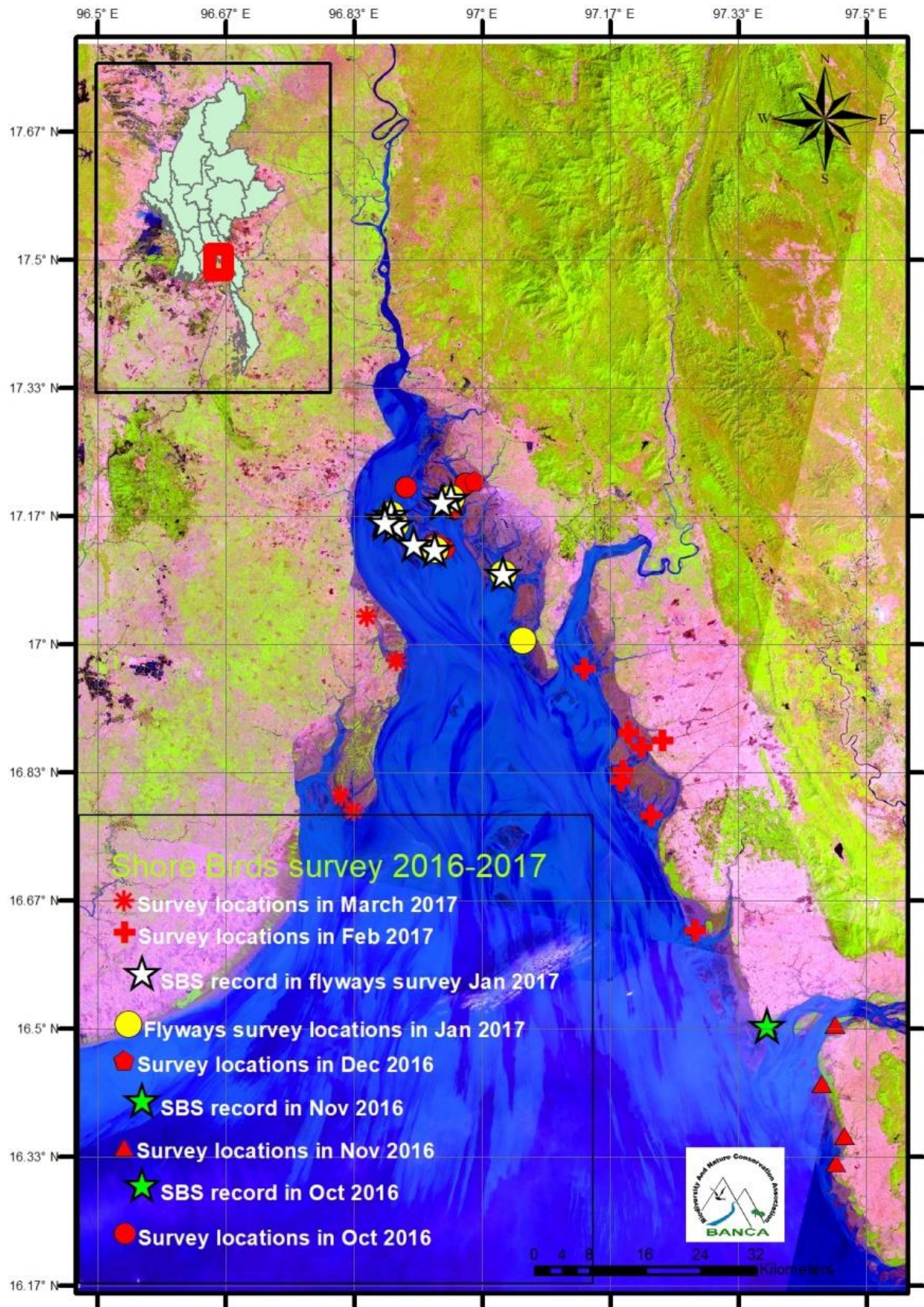
Annex 1: Terrestrial birds list in GoM 2016-2017

No	Common Name	Scientific Name	IUCN Status 2017 (ver 3.1)	Total
1	Rock Pigeon	<i>Columba livia</i>	LC	95
2	Red Collared-Dove	<i>Streptopelia tranquebarica</i>	LC	7
3	Spotted Dove	<i>Streptopelia chinensis</i>	LC	78
4	Common Barn-Owl	<i>Tyto alba</i>	LC	3
5	Collared Scops-Owl	<i>Otus lettia</i>	LC	3
6	Asian Barred Owllet	<i>Glaucidium cuculoides</i>	LC	1
7	Spotted Owllet	<i>Athene brama</i>	LC	2
8	Asian Palm-Swift	<i>Cypsiurus balasiensis</i>	LC	66
9	Germain's Swiftlet	<i>Aerodramus germani</i>	LC	14
10	House Swift	<i>Apus affinis</i>	LC	15
11	Indian Roller	<i>Coracias benghalensis</i>	LC	18
12	White-throated Kingfisher	<i>Halcyon gularis</i>	LC	9
13	Black-capped Kingfisher	<i>Halcyon pileata</i>	LC	31
14	Common Kingfisher	<i>Alcedo atthis</i>	LC	5
15	Little Green Bee-eater	<i>Merops orientalis</i>	LC	133
16	Blue-tailed Bee-eater	<i>Mecops philippinus</i>	LC	59
17	Blue-throated Bee-eater	<i>Merops viridis</i>	LC	19
18	Coppersmith Barbet	<i>Megalaima haemaccephala</i>	LC	4
19	Ashy Minivet	<i>Pericrocotus divaricatus</i>	LC	3
20	Black-naped Oriole	<i>Oriolus chinensis</i>	LC	5
21	Black-hooded Oriole	<i>Oriolus xanthornus</i>	LC	4
22	Ashy Woodswallow	<i>Artamus fuscus</i>	LC	5
23	White-throated Fantail	<i>Rhipidura albicollis</i>	LC	4
24	Common Iora	<i>Aegithina tiphia</i>	LC	6
25	Black Drongo	<i>Dicrurus macrocercus</i>	LC	36
26	Black-nape Monarch	<i>Hypothymis azurea</i>	LC	3
27	House Crow	<i>Corvus splendens</i>	LC	17
28	Jungle Crow	<i>Corvus splendens</i>	LC	15
29	Brown Shrike	<i>Lanius cristatus</i>	LC	17
30	Olive-backed Sunbird	<i>Cinnyris jugularis</i>	LC	12
31	Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	LC	6
32	Baya Weaver	<i>Ploceus philippinus</i>	LC	45
33	White-rumped Munia	<i>Lonchura striata</i>	LC	33
34	Scaly-breasted Munia	<i>Lonchura punctulata</i>	LC	6
35	House Sparrow	<i>Passer domesticus</i>	LC	42
36	Eurasian Tree-Sparrow	<i>Passer montanus</i>	LC	60
37	Olive-backed Pipit	<i>Anthus hodgsoni</i>	LC	6
38	Paddyfied Pipit	<i>Anthus rufulus</i>	LC	7
39	White Wagtail	<i>Motacilla alba</i>	LC	31
40	Eastern Yellow Wagtail	<i>Motacilla tschutschensis</i>	LC	2
41	Jungle Myna	<i>Acridotheres fuscus</i>	LC	98
42	Common Myna	<i>Acridotheres tristis</i>	LC	32
43	Chestnut-tailed Starling	<i>Sturnus malabaricus</i>	LC	3
44	Eastern Stonechat	<i>Saxicola maurus</i>	LC	8
45	Pied Bushchat	<i>Saxicola caprata</i>	LC	8
46	Blue-throated Flycatcher	<i>Cyornis rubeculoides</i>	LC	2

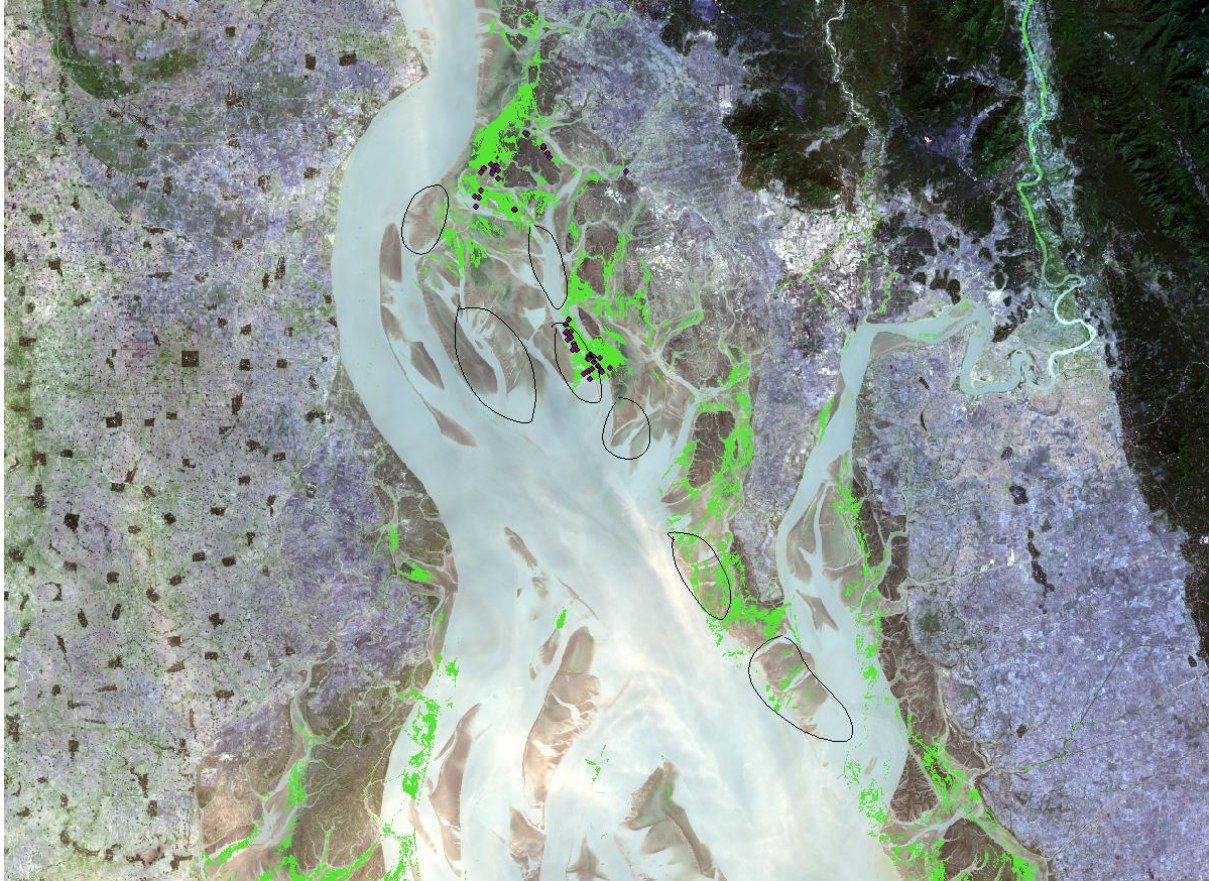
No	Common Name	Scientific Name	IUCN Status 2017 (ver 3.1)	Total
47	Grey-headed Canary-Flycatcher	<i>Culicicapa ceylonensis</i>	LC	3
48	Red-throated Flycatcher	<i>Ficedula albicilla</i>	LC	3
49	Oriental Magpie-Robin	<i>Copsychus saularis</i>	LC	9
50	Oriental Skylark	<i>Alauda gulgula</i>	LC	41
51	Streak-eared Bulbul	<i>Pycnonotus blanfordi</i>	LC	5
52	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	LC	18
53	Red-vented Bulbul	<i>Pycnonotus cafer</i>	LC	14
54	Martin Sp		LC	19
55	Barn Swallow	<i>Hirundo rustica</i>	LC	106
56	House Swallow	<i>Hirundo tahitica</i>	LC	3
57	Red-rumped Swallow	<i>Cecropis daurica</i>	LC	3
58	Ashy Woodswallow	<i>Artamus fuscus</i>	LC	4
59	Dusky Warbler	<i>Phylloscopus fuscatus</i>	LC	8
60	Greenish Warbler	<i>Phylloscopus trochiloides</i>	LC	4
61	Yellow-browed Warbler	<i>Phylloscopus inornatus</i>	LC	4
62	Thick-billed Warbler	<i>Acrocephalus aedon</i>	LC	3
63	Lanceolated Warbler	<i>Locustella lanceolata</i>	LC	1
64	Oriental White-Eye	<i>Zosterops palpebrosus</i>	LC	9
65	Oriental Reed-Warbler	<i>Acrocephalus orientalis</i>	LC	6
66	Zitting Cisticola	<i>Cisticola juncidis</i>	LC	29
67	Common Tailorbird	<i>Orthotomus sutorius</i>	LC	10
68	Yellow-bellied Prinia	<i>Prinia flaviventris</i>	LC	2
69	Plain Prinia	<i>Prinia inornata</i>	LC	19
70	Black -shouldered Kite	<i>Elanus caeruleus</i>	LC	1
71	Red-breasted Parakeet	<i>Psittacula alexandri</i>	NT	3
72	Rose-ringed Parakeet	<i>Psittacula krameri</i>	LC	2
73	Plaintive Cuckoo	<i>Cacomantis merulinus</i>	LC	3
74	Greater Coucal	<i>Centropus sinensis</i>	LC	5
75	Asian Koel	<i>Eudynamys scolopacea</i>	LC	4

Annex 2: Survey Map

Monitoring of shore birds survey in GoM 2016-2017



Annex 3: Changed mudflats in upper Gulf of Mottama(due to the tidal current within a year)



Downloaded Jan 2016



Downloaded March 2017

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