

MONITORING PROGRAMME FOR CRITICALLY ENDANGERED SPOON-BILLED SANDPIPER ON ITS GLOBALLY MOST IMPORTANT WINTERING GROUNDS IN MYANMAR



PYAE PHYO AUNG, TIN AUNG TUN, AUNG MYIN TUN, AUNG NAING OO, MIN THEIN HTET, REN NAUNG SOE, SAW THEIN MAUNG & KYAW THEIN AUNG



MAY 2016

Contents

| | |
|---|----|
| 1. EXECUTIVE SUMMARY | 3 |
| 2. INTRODUCTION | 3 |
| 3. OVERALL OBJECTIVE | 4 |
| 4. METHOD:..... | 4 |
| 5. ITINERARY | 5 |
| 6. PARTICIPANTS..... | 5 |
| 7. SURVEY MAP (GULF OF MOTTAMA, SOUTHERN PART OF GULF OF MOTTAMA AND NANTHAR ISLAND)..... | 6 |
| 8. RESULTS: | 7 |
| 9. DISCUSSION | 13 |
| 10. RECOMMENDATIONS..... | 14 |
| 11. ACKNOWLEDGEMENT | 14 |
| 12. References: | 15 |
| Appendix 1: List of Recorded birds in Gulf of Mottama and Southern Part of Mottama Gulf from October 2015 to March 2016 (Exclude Feb 2016 Flyway coordinate Count)..... | 16 |
| Appendix 2: List of Recorded birds in Gulf of Mottama Feb 2016 Flyway coordinate count results... | 17 |
| Appendix 3: List of Recorded birds in Nanthar Island, Rakhine State from October 2015 to April 2016 | 20 |
| Appendix 4: Other birds recorded in the Gulf of Mottama from October 2015 to March 2016 | 21 |
| Appendix: 5 MEDIA CHANNEL..... | 21 |
| Annex: 6 Upper Gulf of Mottama Satellite images | 22 |

1. EXECUTIVE SUMMARY

The Biodiversity And Nature Conservation Association (BANCA) is recognized as a Species Guardian for the Spoon-billed Sandpiper (SBS) by BirdLife International. BANCA has been collaborating with international organizations (Royal Society for the Protection of Birds, (RSPB), Wildfowl Wetlands Trust (WWT) and British Trust for Ornithology (BTO)) for Spoon-billed Sandpiper Conservation activities in Myanmar since 2008. During 2015-2016, the Spoon-billed Sandpiper wintering survey programme was funded by The Mohamed bin Zayed Species Conservation Fund and the Royal Society for the Protection of Birds (RSPB).

During the winter of 2015-16, BANCA conducted surveys throughout the Gulf of Mottama and, with the Sittwe Nature Conservation Association (SNCA), Nanthar Island for Spoon-billed Sandpiper. A total of 20 SBS were recorded in Nanthar and an estimated 100, including three leg-flagged SBS, in the Gulf of Mottama were recorded during the wintering season until March 2016. On 19th November 2015, there was exciting news for Nanthar, where the survey team recorded one SBS with leg flag number (27), which is the first such record for Nanthar.

The survey teams found that there is still a small threat from hunting birds in the Gulf of Mottama, but on Nanthar, where there has been only limited conservation work so far, there is a high threat to shorebirds from hunting.

Establishing the Gulf of Mottama as a Ramsar Site is a high priority, as well as addressing the threat from hunting on Nanthar Island.

2. INTRODUCTION

The Spoon-billed Sandpiper (SBS) (*Calidris pygmaea*), numbering approximately 120 pairs, has been declining rapidly in recent years (Zöckler et al. 2016) and is heading towards extinction. Although global conservation efforts in recent years appear to have slowed the decline. It is listed as globally Critically Endangered. The loss of the Spoon-billed Sandpiper (SBS) would be particularly disastrous because it is and evolutionarily distinct and it is also a flagship species for the East Asian–Australasian Flyway (EAAF).

The Spoon-billed Sandpiper breeds in Chukotka and Koryakya, in far north-east Russia and in autumn heads south on a precarious migration to winter on the shores of south-east Asia, travelling as far as Bangladesh. 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 off the coast of Rakhine State. There may be other important sites along the coast of Myanmar which have not yet been documented or insufficiently documented. Efforts are underway to protect this species at critical sites in all countries in its range, coordinated by the Spoon-billed Sandpiper Task Force. This project focuses on the most significant wintering grounds which are in Myanmar. BANCA and Arcona Consulting are pioneers for surveying the Spoon-billed Sandpiper in Myanmar in 2008 and soon after the RSPB began supporting BANCA to take emergency action to address threats to this species in Myanmar.

The Gulf of Mottama (formerly and still occasionally referred to as 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 ecosystem supports a rich biota including abundant invertebrates, important nursery areas for marine fish and up to 150,000 migratory waterbirds in the non-breeding season. These include four globally threatened species and 14 species for which the Gulf of Mottama holds internationally significant populations. The Gulf serves as the world's most important wintering ground for the Spoon-billed Sandpiper, hosting probably more than half of the remaining global population.

Nanthar Island is located in western Myanmar, in the coastal area close to Sittwe city in Rakhine State. The island is small area of about 1100 ha with sandy and mudflat habitats and lies at the mouth of the Kalendan River in Myanmar. It is close to the Bangladesh border. There are five villages close to Nanthar Island and the communities live mainly on fishing around Nanthar Island. The importance of Nanthar Island for biodiversity was not known before 2008. Now the island is recognized as an important wintering ground for migratory shorebirds, including Spoon-billed Sandpiper, Nordmann's Greenshank (EN), Painted Stork (NT), Indian Skimmer (VU), Great Knot (EN) and about 5000 small waders wintering on this island. The island is also an important nesting area for Olive Ridley (VU) and Leatherback (VU) sea turtles.

3. OVERALL OBJECTIVE

The overall objective is to contribute to global efforts in saving the Spoon-billed Sandpiper from extinction and conserve other migratory shore bird species by monitoring the status of globally important sites in Myanmar.

The specific objective was to conduct winter surveys of the Spoon-billed Sandpiper throughout the Gulf of Mottama and Nanthar Island.

4. METHOD:

The previous survey results were reviewed for data and potential sites which were identified with Landsat8 from USGS and Google Earth. Surveys were carried out using boats as the main means of transport for moving around the mudflats at high tide. Counts were taken from a designated location by GPS, or along a route, number of each shorebird species present was counted and any threats to shore birds. Particular attention was given to the numbers of Spoon-billed Sandpiper and whether they were marked with numbered leg flags, which would indicate whether they were headstarted birds flagged as chicks on the breeding grounds, breeding adults flagged on the breeding grounds, or birds flagged during migration at stop over sites. At each location, surveyors separated out across the mudflat during the low tide and each flock scanned with telescope and the number of species recorded. An estimate was made for the total number of population of species in each flock.

Most surveys were carried out by a small team from BANCA to serve mainly to monitor areas for threats, the presence of Spoon-billed Sandpiper and estimates of populations of other shorebirds.

During February a larger more comprehensive survey was conducted by BANCA accompanied by a team of experts from the UK (RPSB, WWT, BTO). The main objective of this survey was to estimate the population of the Spoon-billed Sandpiper in the Gulf of Mottama, particularly in relation to other shorebirds. The detailed methodology, analysis and results are being prepared. This report provides initial results with no attempt to estimate the population of the Spoon-billed Sandpiper.

5. ITINERARY

| Date | Activity Description |
|--------------------------|--|
| 15 to 19/10/2015 | Survey in Nanthar Island |
| 22 to 26/10/2015 | Survey in east coast of Gulf of Mottama |
| 13 to 17/11/2015 | Survey in east coast of Gulf of Mottama |
| 15 to 19/11/2015 | Survey in Nanthar Island |
| 01 to 09/12/2015 | Survey in east coast of Gulf of Mottama |
| 11 to 15/12/2015 | Survey in Nanthar Island |
| 26/12/15 To 01/01/2016 | Survey in east coast of Gulf of Mottama |
| 13 to 15/01/2016 | Survey in Nanthar Island |
| 07 to 14/02/2016 | Survey in Gulf of Mottama (Collaboration with International survey Team) |
| 08 to 13/02/2015 | Survey in Nanthar Island |
| 22/02/2016 to 02/03/2016 | Survey in Southern Part of Gulf of Mottama |
| 14 to 21/03/2016 | Survey in west coast of Gulf of Mottama |
| 7 to 10/4/2016 | Survey in Nanthar Island |

6. PARTICIPANTS

| Sr.No | Name | Occupation | Organization |
|-------|-----------------|------------------|--------------|
| 1 | Pyae Phyo Aung | Program Manager | BANCA |
| 2 | Tin Aung Tun | Program Officer | BANCA |
| 3 | Aung Myin Tun | Program Officer | BANCA |
| 4 | Aung Naing Oo | Site Based Staff | BANCA |
| 6 | Min Thein Htet | Member | BANCA |
| 7 | Ren Naung Soe | Team Leader | SNCA |
| 8 | Saw Thein Maung | Member | SNCA |
| 9 | Kyaw Thein Aung | Member | SNCA |

7. SURVEY MAP (GULF OF MOTTAMA, SOUTHERN PART OF GULF OF MOTTAMA AND NANTHAR ISLAND)



25 0 25 50 km

Legend

○ SBS Recorded Point ● Survey Point

8. RESULTS:

During the period of October 2015 to April 2016, BANCA and SNCA field survey team surveyed the Gulf of Mottama, southern part of Mottama and Nanthar Island. During the October survey period, the team recorded a net for bird hunting near Aung Kan Thar village in the eastern Gulf of Mottama. A full list of detailed results is given in Appendices 1, 2, 3 and 4.

8.1 Gulf of Mottama Surveys October 2015 to March 2016 (details in Appendices 1 and 4)

8.1.1. Survey near Aung Kan Thar village in the Gulf of Mottama, 22nd to 26th October 2015

This was the first survey in the Gulf of Mottama this winter. The survey team left from Aung Kan Thar village (N16.87514 E97.23576) at 10:55PM during the highest tide and arrived at Ganan Thaung (N 16.82440 and E 97.18541) at 11:50PM and slept on the boat overnight. Next morning, the team surveyed for about two hours before high tide and recorded few shore birds near the boat. With the high tide, the boat moved to Kyauntharyar point (N 16.99066 E 97.05811) where the team recorded SBS in 2014 and stopped about five kilometers away from this point. During the ebb tide, the team recorded a flock of over one thousand shore birds. The team recorded a net for catching birds about 300 meters long set up on the mudflat. At that time, four fishing boats stopped near the bird catching net area, but no information was available from fishermen for the bird net. These fishermen are setting up very small mesh size fishing nets, which are illegal.

During the second night, when the high tide came in, the boat moved five kilometers from the first survey point and stayed overnight. The wind was strong and heavy rain at 4:30AM and the team couldn't survey when the tide ebbed 7:30AM. After the rain, the team recorded over one hundred small waders including a single Spoon-billed Sandpiper. After that, the team split into two and northern and western sites and recorded over two hundred small waders. When the high tide came again, the boat moved down to Kyauktalone point (N 16.80432E 97.10169) about 20 kilometers away from recorded site of the single Spoon-billed Sandpiper. The next day the team continued survey and recorded over one hundred small waders.

8.1.2 Survey in the Gulf of Mottama, 13th to 17th November 2015

The second survey in Mottama was carried out in November. The survey left Thein Ngu village (N 17.28310 E 97.03966) at 6:15AM and arrived at Wae Pyan (N17.07247 E 97.00279) at 8:10AM. During the first day, the team recorded a few shorebirds in this area and moved a few kilometers when the next high tide came. Next morning, the team moved to Gar Thaung (N 17.14481 E 96.95882). In that area, the survey team recorded one Spoon-billed Sandpiper with a light green color flag on the right leg among a flock of about one thousand small waders including Kentish plovers, Lesser Sand plover, Red-necked stints and others. When the high tide came, the boat moved five kilometers to the east and stayed overnight. During the five days period, the team recorded one Spoon-billed Sandpiper, over hundreds small waders including over one hundred Black-tailed Godwit.

8.1.3 Survey in the Gulf of Mottama, 1st to 9th December 2015

The third SBS field survey in the Gulf of Mottama was carried out for seven days from 1st to 9th Dec 2015. During this survey, three individuals of SBS were recorded.

Lower Wae Pyan (N 17.07247 E 97.00279)

The team surveyed for about three hours in the lower Wae Pyan before high tide and about 3000 individual shorebirds were recorded. This habitat is a sand flat covered with thin and soft muds which made it a good feeding ground for SBS.

Kyuntharyar (N 17.07247 E 97.00279)

The team surveyed for about three hours in lower Wae Pyan before high tide and about 3000 individual shorebirds were recorded. This habitat is sand flat covered with thin and soft muds which made it a good feeding ground for SBS

Phyu Win Pauk (N 17.03085 E 97.03978)

About 1150 shore birds were recorded in this area. The weather was not good due to a storm in the Bay of Bengal and the team couldn't survey in the next morning.

Wae Pyan (N 17.17281 E 97.95882)

Only a few shore birds were recorded at this site. In the evening, the high tide didn't reach the boat and the team couldn't move.

Wae Pyan (Inside) (N 17.16837 E 96.97327)

The boatman moved the boat inside the Wae Pyan during the morning low tide. The mud flats were smaller than the previous year and the habitat was unsuitable for Spoon-billed Sandpiper and other wader species. Previous year, the habitat is suitable for Spoon-billed Sandpiper. Less than 100 individuals small waders were recorded in this area.

15 Minute Pauk (N 17.21411 E 96.97337)

During the last day of this survey, the team surveyed 15 Minute Pauk and recorded only a few shorebirds.

8.1.4 Survey in Gulf of Mottama on 26th Dec 2015 to 1st January 2016

The team surveyed in the lower Gulf of Mottama for seven days. The team left Their Ngu village at 6:00AM on 26 December and arrived at upper Koe Tae Su at 7:50AM, then moved to Wae Pyan area when the high tide came in the evening.

On 28th December, the team went to Kyuntharyar (N 16.99066 E 97.05811) from Wae Pyan (N 17.15602 E 96.96124). At Kyuntharyar point, the team split into three groups and came back to the boat at 12:15PM. The next tide came at 4:30PM and the team moved to Taung Gyi Pauk (N 17.02134 E 97.04893) and stayed overnight. The team did not see any wader during the trip.

On 29th December, the team started to survey at 9:00AM and recorded a single Spoon-billed Sandpiper among other waders. The team spent overnight at the same location of Taung Gyi Pauk.

On 30th December, the team continued to survey and recorded four Spoon-billed Sandpipers and other small waders. At 6:30PM, the team left Taung Gui Pauk to Wae Pyan area and stayed overnight.

On 31st December, the team continued to survey at Gar Thaug (N 17.14805 E 96.93491) and recorded a few waders. In the evening, the team moved to Koe Tae Su village with the high tide and stayed overnight there. On the 1st January the team left Koe Tae Su village and returned to Their Ngu village.

8.1.5 Spoon-billed Sandpiper coordinated winter count in the Gulf of Mottama from 7th to 13th February 2016 (See appendix 2)

A combined survey team of twelve people from the UK and from BANCA surveyed the upper Gulf of Mottama for a period of seven days and recorded one hundred Spoon-billed Sandpipers.

Near Koe Tae Su village (N17.21044 E97.00102)

The team left Thein Ngu village to Ko Tae Su on 7th February 2016 and surveyed about three hours near Koe Te Su village and recorded some shorebirds and came back to the village at 6:00 pm. Many shorebirds were recorded in this area and fortunately one individual Spoon-billed Sandpiper was also recorded. The team slept near Koe Tae Su village and early next morning, travelled to lower Wae Pyan at 4:00 AM.

Lower Wae Pyan (N17.13945 E96.98466)

The team divided into six groups of two to cover the survey area. Several thousand shorebirds were recorded and 5 SBS were also recorded in this site. In the evening, boats were relocated to Nwar Khoe Kyun and stayed overnight.

Nwar Khoe Kyun (N17.10436 E97.01283)

On the 9th February 2016, the teams surveyed at Nwar Khoe Kyun. The team was divided into six groups and started to survey at 8:00 AM. Several thousand shorebirds including 7 SBS were recorded at the survey area. With the evening high tide, the team moved to Thin Hton Pauk and stayed overnight.

Thin Hton Pauk (N17.20496 E96.92849)

On the morning of 10th February 2016, all groups surveyed at Thin Hton Pauk and recorded several thousand shorebirds, including 30 SBS. After that, all groups returned to the boats at about 1:30 PM and stayed overnight.

On the morning of 11th February 2016, the team surveyed near Thin Hton Pauk, starting at 9:00 AM and recorded 29 SBS. Pacific Golden Plovers and Kentish Plovers were mostly found and the team returned to the boats at 2:00PM. The survey team moved to 15 minutes Pauk in the evening high tide and arrived at 8:30 PM.

15 Minutes Pauk (N17.17237 E96.91126)

Many shorebirds including 9 SBS were recorded at 15 Minutes Pauk on the 12nd February 2016. The team came back to the boats at about 3:30 pm and stayed overnight.

Koe Te Su (N17.25612 E96.93243)

In the morning of 13th February, the team moved near to Koe Tae Su and surveyed from 10:00 am to 1:00 pm. A few shorebirds including 2 SBS were recorded in this survey site. The team came back to Koe Tae Su village and stayed overnight at the village. On 14th February 2016 morning, the team returned from Koe Tae Su village at 7:00 AM, arrived at Thein-Ngu Base Camp at 8:30 AM and proceeded to Yangon at 9:00 AM.

8.1.6 Survey in Southern Gulf of Mottama Kayokepi, Kyaikkhame, Kadatdauk, Setsei, Zigone, Selpalar, Tawpon and Ahlat village, 22th Feb To 2nd March 2016

Southern parts of Gulf of Mottama was surveyed from 22nd Feb To 2st March 2016. Habitats were fine for SBS but the team didn't record any SBS in these survey sites.

Karokpei (N15.85473 E97.70937)

The survey team left Yangon at 8:30 AM and arrived at Thanbyuzayat Township at 4:30 PM and halted in Thanbyuzayat. The next morning, the team travelled to Karokepi village at 6:00 AM and arrived at 7:00 AM. Surveying started near Karokepi village at 8:15 AM. Several hundred shorebirds were recorded in this area but not Spoon-billed Sandpiper. After the survey, the team came back from Karokepi village and proceeded to Thanbyuzayat.

Kyeikkhamee (N16.08311 E97.56528)

In the morning, the team travelled from Thaphyuzayat to Kyeikkhamee. The team surveyed near Kyaikkhamee and Kadatdauk village for about two hours. No shorebird in this area was recorded because of its rocky shore and crowded pilgrims. Next day, the survey team moved to Setsei village. This area is very similar to Kyaikkhamee. The team moved from Setsei to Mawlamyine and stayed overnight. Next morning, the team travelled from Mawlamyine to Zigone village.

Zigone village (N16.31310 E97.45545)

The team started surveying near Zigone and Selpalar village at 8:00 AM and came back to Zigone at 11:30AM. Spoon-billed Sandpiper was not recorded in this area. Next day, the team surveyed near Tawpon village at 8:00 AM and came back to Zigone at 12:30 PM. After two days of surveying, the team moved from Zigone to Ahlat village.

Khindan (N16.50475 E97.37034)

The team surveyed near Shwetharhlyaug pagoda at 8:30AM. Hundreds of shorebirds were recorded in this area. Next morning, the northern part of Khindan village was surveyed and recorded thousands of shorebirds in this site. Although many shorebirds were recorded, the team didn't record Spoon-billed Sandpiper.

8.1.4 Survey in Western Part Gulf of Mottama on 14 to 21 March 2016

The team surveyed Gulf of Mottama from 14 to 21 March 2016. During the period of 8 days, the team didn't record Spoon-billed Sandpiper where the patrolling team had recorded three SBS in November 2015.

Myat Nu Thaung (N16.78354 E96.83257)

The survey team travelled to Myat Nu Thaung from Sa Ta Lin village. During the ebb tide, the team surveyed in Myat Nu Thaung and about 7000 small waders were recorded. There were no records of any SBS nor Stint in this area.

A Kyaw Pauk (N16.80305 E96.82600)

The team moved to A Kyaw Pauk when the tide was high in the morning of second day and recorded about 300 small waders.

Myat Nu Thaug Htake (N16.82545 E96.79780)

This area has good feeding grounds for SBS but it wasn't recorded in this area. About 3000 small waders were recorded.

Aung Matethar Ashae Thaug (N16.84081 E96.79362)

About 300 small waders were recorded.

Kannar Thaug (N16.80366 E96.78497)

In the morning, the team moved to the Kannar Thaug and surveyed this area for about four hours, recording about five hundred small waders.

8.2 Survey of the Spoon-billed Sandpiper in Nanthar Island (See appendix 3)

Spoon-billed Sandpiper surveys were carried out by Sittwe Nature Conservation Association (SNCA) on Nanthar island, from October 2015 to April 2016 (See details in Appendices 2 and 4). During the survey period, two beached individuals of Ayeyarwaddy Dolphin (*Orcaella brevirostris*) were recorded near Nanthar Island on 15 November 2015 and some bird hunting activities in Nanthar Island.

The survey team has three members and started the survey journey from Sittwe to Yae Chan Sin village by car and travelled to Nanthar Island by boat. The team spent 5 days and camped on Nanthar Island during the survey period of October 2015 to April 2016. The team recorded bird hunting at Nanthar Island in October 2015, using one line of old fishing nets. The team following morning the team visited the hunter, Mr. Ba Thein, living at Kone Tans village, to explain about the hunting issue and requested that he stops hunting. The hunter was selling the bird at the local market and said that he only hunts birds occasionally.

9. Record photos in the field survey period



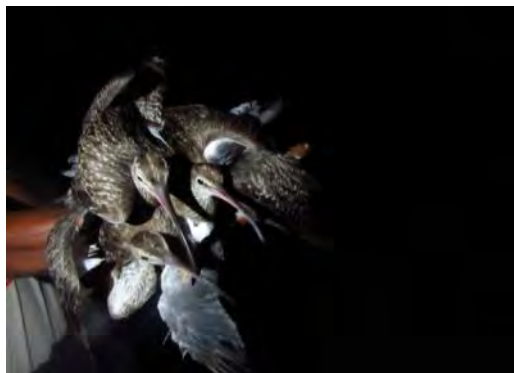
Bird catching net (Left and Right) in Kyuntharyar (Gulf of Mottama)



Habitat of the Spoon-billed Sandpiper (Left and Right)



Flocks of the Shorebird in the Gulf of Mottama (Left and Right)



Shorebirds in nets (Nanthar Island)



Survey Team at the Gulf of Mottama

9. DISCUSSION

A total of 100 Spoon-billed Sandpipers were recorded during the wintering period of 2015-2016 in the Gulf of Mottama, mainly during a large count conducted by the joint BANCA-international team in February. Nine Spoon-billed Sandpipers were recorded during other monitoring surveys throughout the season in the Gulf of Mottama by BANCA. The distribution of Spoon-billed Sandpipers in the upper Gulf of Mottama was different from 2015. This is because huge new mudflats emerged this year in the Gulf of Mottama which makes it difficult to identify exactly where are the best locations for surveying (See Annex 6). Generally, the survey team saw few flocks of big waders in the Gulf and local fishers also noticed this phenomenon. The small wader population counted during the joint BANCA-international team survey in the Gulf of Mottama February was about 90,000, which is similar to 2015. During that survey the number of large waders recorded was 8500, which is greater than 2015. Some small mudflats (about 500m²) were noticed to have disappeared within two weeks between the end of January and early February.

During the joint BANCA-international survey, the team recorded three flagged SBS. Lime 24 was ringed as a chick in 2010 and then caught again on the nest at Meinypil'gyno in summer 2015 and flagged on the right leg, as already ringed on the left. This bird was also seen in autumn 2015 at the Tiaozini mudflat on the Jiangsu coast in China. The second flagged bird was not seen well. White X7, was a head-started bird from 2015. There was another sighting of a white flagged bird some 5km away from the next day, which could have been second head-started bird, but we were unable to see the flag code. For Nanthar, during the survey period from October 2015 to April 2016, maximum 20 individuals of SBS were recorded.

Hunting still remains as the main threat to shorebirds and the Spoon-billed Sandpiper. The only record of hunting shorebirds with nets in the Gulf of Mottama was close to Aung Kan Thar village. Shorebirds were not seen being sold in the local markets at Kyeikhto and Thahton as they were several years ago before conservation work began in the Gulf of Mottama

10. RECOMMENDATIONS

The global population of the Spoon-billed Sandpiper is tentatively estimated at about 120 breeding pairs, and the Gulf of Mottama could hold as much as half the global population during the winter season. Therefore the Gulf of Mottama needs to be protected as a high priority for intertidal mudflat conservation, not only for Myanmar, but also for its global importance.

Surveys with small team are more adaptable to assess distribution of the Spoon-billed Sandpiper and other shorebirds among changing mudflat conditions. Surveys with large teams are required for systematic counts over a short period of time to estimate the population of the Spoon-billed Sandpiper. In Myanmar, there are few ornithologists who can identify Spoon-billed Sandpiper so international support is still needed for training and involvement in larger surveys.

Training is required for local community for shorebird watching. This can be done by BANCA.

Bird hunting activities have considerably decreased in the Gulf of Mottama, but still sometimes occurs. According to a hunting assessment survey in 2010-2011, BANCA identified 63 bird hunters in the Gulf of Mottama. Local Conservation Groups (LCGs) carry out patrolling in wintering season with BANCA. Patrolling is very important for monitoring shore bird hunting in the Gulf. Patrolling by the LCGs needs to be further developed with systematic and official reporting to relevant government departments (General Administrative, Forestry and Fishery depts.) by using SMART patrolling in the future.

At present, Nanthar Island does not fall under the management of the State Government nor Forest Department. The previous government handed the authority to Veteran Soldiers Organization to manage Nanthar, because Nanthar Island has military importance. However as the island has a lot of potential biodiversity value, it should be managed as a protected area.

Gulf of Mottama is not only important for migratory birds but also local communities. About 70% of households are living around the Gulf of Mottama rely on fishing for their income. Community participation is crucial for the long term conservation of the Gulf and it is highly needed to address illegal fishing and any remaining bird hunting in the area. The Gulf should be established as a Ramsar site, with develop site level management plans which include monitoring of natural resources and hunting issues by local communities, overseen by a site management committee.

11. ACKNOWLEDGEMENT

We would like to thank the surveyors from Sittwe Nature Conservation Association (SNCA) and Biodiversity And Nature Conservation Association (BANCA) for their valuable time and efforts and many many thanks are duly paid to the Mohamed bin Zayed Species Conservation Fund and Royal Society for the Protection of Birds (RSPB), Arcona Consulting and Lighthouse Foundation for financial and technical support.

12. References:

1. Christoph Zöckler, Alison E. Beresford, Gillian Bunting, Sayam U. Chowdhury, Nigel A. Clark, Vivian Wing Kan Fu, Tony Htin Hla, Vladimir V. Morozov, Evgeny E. Syroechkovskiy, Minoru Kashiwagi, Elena G. Lappo, Menxiu Tong, Trai Le Long, Yat-tung Yu, Falk Huettmann, Herrick k. Akasofu, Hiroshi Tomida and Graeme M. Buchanan. 2016. The winter distribution of the Spoon-billed Sandpiper *Calidris pygmaeus*. Bird Conservation International, Available on CJO 2016 doi:10.1017/S0959270915000295
2. Robson, C. 2011. A field guide to the birds of South-east Asia. New Holland Publisher, London, 544 pp.
3. Bird watching training and survey of Critically Endangered Spoon-billed Sandpiper 2013-2014 BANCA report.

Appendix 1: List of Recorded birds in Gulf of Mottama and Southern Part of Mottama Gulf from October 2015 to March 2016 (Exclude Feb 2016 Flyway coordinate Count)

| Date | 22/10/2015 to 26/10/2015 | 14/11/2015 to 19/11/2015 | 01/12/2015 to 09/12/2015 | 26/12/2015 to 01/01/2016 | 22/02/2016 to 02/03/2016 | 14/03/2016 to 21/03/2016 |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Approximate centre of survey – Latitude | N 16.82440 | N17.20094 | N 17.07247 | N17.21219 | N17.21219 | N16.78354 |
| Approximate centre of survey – Longitude | E 97.18514 | E96.97381 | E 97.00279 | E96.99509 | E96.99509 | E96.83257 |
| Kentish Plover | 61 | 447 | 191 | 1513 | 2767 | 3836 |
| Lesser Sand Plover | 117 | 410 | 1618 | 4618 | 2304 | 5330 |
| Greater Sand Plover | 6 | 16 | 5 | | | |
| Red-necked Stint | 275 | 163 | 241 | 591 | 100 | 9 |
| Curlew Sandpiper | 93 | 136 | 71 | 85 | | 1816 |
| Broad-billed sandpiper | 5 | 38 | | 28 | | 5 |
| Spoon-billed Sandpiper | 1 | 1 | 3 | 4 | | |
| Marsh Sandpiper | | 2 | | 6 | | 6 |
| Common Redshank | 27 | 124 | 348 | | 5 | 184 |
| Grey Plover | 5 | 22 | | 7 | 2 | 48 |
| Black-tailed Godwit | 1378 | 125 | 338 | 228 | | 84 |
| Eurasian Curlew | 16 | 126 | 155 | 16 | | 33 |
| Common Greenshank | 2 | 94 | 67 | 59 | 64 | 5 |
| Whimbrel | | 57 | 131 | 19 | 27 | 39 |
| Pacific Golden Plover | | | 42 | 10 | 4 | 587 |
| Terek Sandpiper | 6 | 44 | 1 | | | |
| Great Knot | | 4 | | | 9 | 12 |
| Ruddy Turnstone | | 24 | | | | |
| Sanderling | | 5 | | | | 8 |
| Grand Total | 1992 | 1838 | 3211 | 7184 | 5282 | 12002 |

Appendix 2: List of Recorded birds in Gulf of Mottama Feb 2016 Flyway coordinate count results

| Date | 7-Feb-16 | 8-Feb-16 | 8-Feb-16 | 8-Feb-16 | 9-Feb-16 | 9-Feb-16 | 10-Feb-16 | 11-Feb-16 | 12-Feb-16 | 12-Feb-16 | 13-Feb-16 | 13-Feb-16 | Minimum total count for 2016 survey |
|---|----------|----------|----------|----------|-----------------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------|
| Aproximate centre of survey - Latitude | 17.21041 | | 17.14604 | 17.08858 | 17.08881 | 17.19367 | 17.20585 | 17.16926 | 17.22588 | 17.24761 | 17.20977 | 17.18864 | |
| Aproximate centre of survey - Longitude | 97.00096 | | 96.97379 | 97.00775 | 97.01193 G,J was 3 | 96.92430 | 96.92567 | 96.91327 | 96.91769 | 96.92315 | 96.98044 | 96.96996 | |
| Survey units | 1 | 2 | 3 | 7 | 7 | 4 | 4 | 5 | 4 | 6 | 1 | 2 | |
| Pintail Snipe | | | | | | | | | | | | | |
| Common Snipe | | | | | | | | | | | | | |
| Black-tailed Godwit | | 200 | 1243 | 2000 | 200 | 1100 | 2900 | 2500 | 1500 | 2100 | 145 | 12 | 8588 |
| Bar-tailed Godwit | | 24 | 6 | | | | | 150 | | | | 80 | 236 |
| Whimbrel | | 140 | 34 | | | 100 | 3 | 1 | | | 68 | 85 | 343 |
| Eurasian Curlew | | 26 | 149 | | 200 | 100 | 400 | 100 | | 1 | 65 | 13 | 941 |
| Ruff | | | | | | 2 | 2 | | | 12 | | | 14 |
| Green Sandpiper | | | | | | | | | | 1 | 1 | | 2 |
| Wood Sandpiper | 1 | | | | 1 | | | | | 20 | 1 | 1 | 23 |
| Terek Sandpiper | | | 3 | | 2 | | | 5 | | | | | 10 |
| Common Sandpiper | 30 | 3 | | 4 | | | 4 | 2 | | 6 | 16 | 1 | 49 |
| Ruddy Turnstone | | | | | | | | | | | | | |
| Asiatic Dowitcher | | | | | | | | | | | | | |
| Spotted Redshank | | 3 | 1 | | 3 | 5 | 70 | 15 | | 18 | 4 | 8 | 119 |
| Common Redshank | 15 | 233 | 517 | | 100 | 850 | 360 | 475 | 150 | 950 | 270 | 28 | 3385 |
| Marsh Sandpiper | | | 40 | | 5 | 270 | 150 | 150 | 50 | 110 | 20 | 0 | 555 |
| Common Greenshank | 10 | 7 | 50 | | 47 | 210 | 100 | 50 | 2 | 60 | 26 | 10 | 453 |
| Nordmann's Greenshank | | | 1 | | | | | | | | | | |
| Sharp-tailed Sandpiper | | | | | | | | | | | | | |
| Sanderling | | | | | 1 | | | | | | | | 1 |
| Spoon-billed Sandpiper ¹ | 1 | | 5 | | 7 | | 30 | 29 | 0 | 9 | | 2 | 100 |
| Little Stint ² | | | 2 | | | | 3 | 1 | | 1 | | | 7 |
| Red-necked Stint | | | | | | | | | | | | | 10792 |
| Temminck's Stint | 18 | | 3 | | | | 1 | 2 | | 17 | 11 | | 41 |
| Long-toed Stint | | | | | | | | | | 6 | 5 | | 11 |

| | | | | | | | | | | | | | |
|-----------------------------------|------------|-------------|--------------|-------------|-------------|-------------|--------------|--------------|-------------|--------------|-------------|-------------|--------------|
| Great Knot | | 32 | | 20 | | | | | | | | | 52 |
| Red Knot | | | | | | | | | | 1 | | | 1 |
| Curlew Sandpiper | 9013 | | | | | | | | | | | | |
| Broad-billed Sandpiper | 3409 | | | | | | | | | | | | |
| Small Pratincole | | | | | | | | | | | | | |
| Oriental Pratincole | | | | | | | | | | | | 2 | 2 |
| Black-winged Stilt | | | | | | | | | | | | | |
| Pied Avocet | | | | | | | | | | | | | |
| Common Ringed Plover | | | | | | | | | | | | | |
| Little Ringed Plover | 810 | | | | | | | | | | | | |
| Kentish Plover | 14648 | | | | | | | | | | | | |
| Lesser Sand Plover | 24461 | | | | | | | | | | | | |
| Greater Sand Plover | 26 | | | | | | | | | | | | |
| Pacific Golden Plover | 230 | 20 | 95 | 150 | 400 | 300 | 129 | 500 | 1700 | 106 | 30 | | 2834 |
| Grey Plover | | 9 | 27 | 16 | 10 | | | | | 9 | 6 | | 71 |
| Total small plovers and calidrids | 350 | 6000 | 10000 | 6800 | 2500 | 13000 | 17000 | 3000 | 7460 | 1000 | 8000 | | |
| Total Waders | 655 | 6697 | 12176 | 2004 | 7552 | 5547 | 17323 | 20609 | 5202 | 12472 | 1747 | 8278 | 80997 |
| Ruddy Shelduck | | | | | | | | | | | | | |
| Common Shelduck | | | | | | | | | | | | | |
| Eurasian Wigeon | | | | | | | | | | | | | |
| Pintail | | | | | | | | | | | | | |
| Total Wildfowl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black-headed Gull | | | | 1 | | | | | 1 | | | | 1 |
| Pallas's Gull | | 13 | 7 | 120 | 50 | 85 | 18 | | 40 | 5 | 7 | | 338 |
| Brown-headed Gull | | 150 | 20 | 57 | 120 | 165 | 50 | | 1000 | 1 | 18 | | 1443 |
| Gull-billed Tern | | | 5 | 1 | | 3 | | | | 1 | 11 | | 21 |
| Caspian Tern | | | 5 | 7 | 2 | 3 | | | | | | | 15 |
| Little Tern | 5 | | 10 | 3 | | 50 | 10 | | 7 | 3 | 3 | | 88 |
| Whiskered Tern | 10 | | 100 | 75 | 25 | 130 | 100 | | | | 150 | | 565 |
| White-winged Tern | | | | 500 | | 550 | 300 | | | | | | 1350 |
| Whiskered/White-winged Tern | | | | 8000 | 5250 | 1000 | 600 | | 1000 | 1000 | 3000 | | 18850 |
| Total Gulls and Terns | 15 | 163 | 147 | 8000 | 763 | 5447 | 1986 | 1078 | 0 | 2047 | 1010 | 3189 | 22671 |

| | | | | | | | | | | | | | |
|---|------------|-------------|--------------|--------------|-------------|--------------|--------------|--------------|-------------|--------------|-------------|--------------|---------------|
| Little Egret | 30 | 2 | 2 | 30 | 45 | 13 | | 2 | 6 | 19 | 14 | 115 | |
| Grey Heron | 10 | 25 | 8 | | 18 | 35 | 30 | 10 | 5 | 8 | 23 | 164 | |
| Great Egret | 1 | 20 | 5 | 100 | 145 | 25 | 60 | 40 | 7 | 10 | 27 | 330 | |
| Pacific reef Egret | | | | | | | | | | | | | |
| Intermediate Egret | | | | 10 | 8 | 1 | 7 | 1 | 4 | 2 | 4 | 24 | |
| Pond Heron spp. | 3 | | | | | | | | | 8 | 2 | 10 | |
| Black-crowned Night Heron | | | | | | 5 | 7 | 1 | | 3 | 1 | 12 | |
| Black-headed Ibis | | | | 2 | 63 | 15 | 31 | 56 | | | 5 | 163 | |
| Painted Stork | | | | | | 1 | 3 | 2 | | | | 5 | |
| Asian Openbill | | | | | | | | | | | | | |
| Total other dependent waterbirds | 44 | 47 | 15 | 142 | 279 | 82 | 151 | 110 | 18 | 29 | 83 | 823 | |
| Peregrine | | | | | | 1 | 2 | 1 | | | | 3 | |
| kestrel | | | | 1 | | | | | | | | 1 | |
| Eastern Marsh Harrier | 5 | 2 | 5 | 12 | | 60 | 12 | 1 | 8 | 25 | 8 | 119 | |
| Pied Harrier | | | | | | 1 | | | 1 | | | 2 | |
| Total raptors | 5 | 2 | 5 | 13 | 0 | 62 | 14 | 2 | 0 | 9 | 25 | 125 | |
| Total wetland dependant species | 719 | 6909 | 12343 | 10159 | 8594 | 11138 | 19474 | 21799 | 5220 | 14557 | 2865 | 11565 | 104616 |

Appendix 3: List of Recorded birds in Nanthar Island, Rakhine State from October 2015 to April 2016

| Date | 15/10/2015 to 19/10/2015 | 15/11/2015 to 19/11/2015 | 11/12/2015 to 15/12/2015 | 13/01/2016 to 15/01/2016 | 8/02/2016 to 13/02/2016 | 7/04/2016 to 10/04/2016 |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|
| Approximate centre of survey -Latitude | N 20.24456 | N 20.24444 | N20.24502 | N20.25257 | N20.25002 | N20.24850 |
| Approximate centre of survey -Longitude | E 92.74578 | E 92.74579 | E92.74299 | E92.74246 | E92.74309 | E92.74277 |
| Kentish Plover | 266 | 140 | 150 | 210 | 190 | 100 |
| Lesser Sand Plover | | 37 | 40 | 315 | 425 | 230 |
| Greater Sand Plover | | 16 | 15 | | 49 | |
| Red-necked Stint | 180 | 85 | 55 | 5 | 345 | 170 |
| Curlew Sandpiper | | 90 | 50 | 34 | 60 | 25 |
| Broad-billed Sandpiper | | 17 | 25 | 20 | 35 | 7 |
| Spoon-billed Sandpiper* | | 10 | 11 | 10 | 1 | 5 |
| Marsh Sandpiper | | 2 | | | | |
| Common Redshank | 108 | 77 | 40 | 13 | 140 | 92 |
| Grey Plover | 37 | 22 | 17 | 30 | 12 | 53 |
| Black-tailed Godwit | | 7 | 4 | 188 | 200 | |
| Eurasian Curlew | 312 | 110 | 90 | 45 | 100 | 40 |
| Common Greenshank | | 65 | 32 | 24 | 81 | 32 |
| Whimbrel | 46 | 8 | 15 | | 10 | 9 |
| Pacific Golden Plover | | | | 2 | | |
| Terek Sandpiper | 22 | 44 | 9 | | 50 | 50 |
| Great Knot | | 4 | | | 50 | 45 |
| Ruddy Turnstone | 42 | 24 | 12 | | 39 | 24 |
| Sanderling | | 5 | | | 20 | |
| Grand Total | 1013 | 763 | 565 | 896 | 1807 | 882 |

Appendix 4: Other birds recorded in the Gulf of Mottama from October 2015 to March 2016

| Species Name | Scientific name | No of Individuals |
|---------------------------|------------------------------------|--------------------------|
| Greylag Goose | <i>Anser anser</i> | 4 |
| Ruddy Shelduck | <i>Tadorna ferruginea</i> | 53 |
| Eurasian Wigeon | <i>Anas penelope</i> | 6 |
| Northern Pintail | <i>Anas acuta</i> | 17 |
| Painted Stork | <i>Mycteria leucocephala</i> | 42 |
| Black-headed Ibis | <i>Threskiornis melanocephalus</i> | 97 |
| Black-crowned Night-Heron | <i>Nycticorax nycticorax</i> | 4 |
| Pond-Heron | <i>Ardeola spp</i> | 60 |
| Grey Heron | <i>Ardea cinerea</i> | 133 |
| Great Egret | <i>Ardea alba</i> | 43 |
| Intermediate Egret | <i>Mesophoyx intermedia</i> | 19 |
| Little Egret | <i>Egretta garzetta</i> | 51 |
| Spot-billed Pelican | <i>Pelecanus philippensis</i> | 2 |
| Little Cormorant | <i>Phalacrocorax niger</i> | 28 |
| Peregrine Falcon | <i>Falco peregrinus</i> | 8 |
| Black-eared Kite | <i>Milvus lineatus</i> | 22 |
| Short-toed Snake-Eagle | <i>Circaetus gallicus</i> | 1 |
| Eastern Marsh-Harrier | <i>Circus spilonotus</i> | 11 |
| Little Tern | <i>Sternula albifrons</i> | 121 |
| Gull-billed Tern | <i>Gelochelidon nilotica</i> | 9 |
| Caspian Tern | <i>Hydroprogne caspia</i> | 24 |
| White-winged Tern | <i>Chlidonias leucopterus</i> | 741 |
| Whiskered Tern | <i>Chlidonias hybrida</i> | 503 |
| Pallas's Gull | <i>Larus ichthyaetus</i> | 36 |
| Brown-headed Gull | <i>Chroicocephalus</i> | 74 |

Appendix: 5_MEDIA CHANNEL

February 2016 survey was broadcasted in Kamaryut Media channel which is one of the popular channel and about 3.5 million people watching this channel. The link is below:

https://www.youtube.com/watch?v=JzDcnCKX4ZE&feature=player_embedded

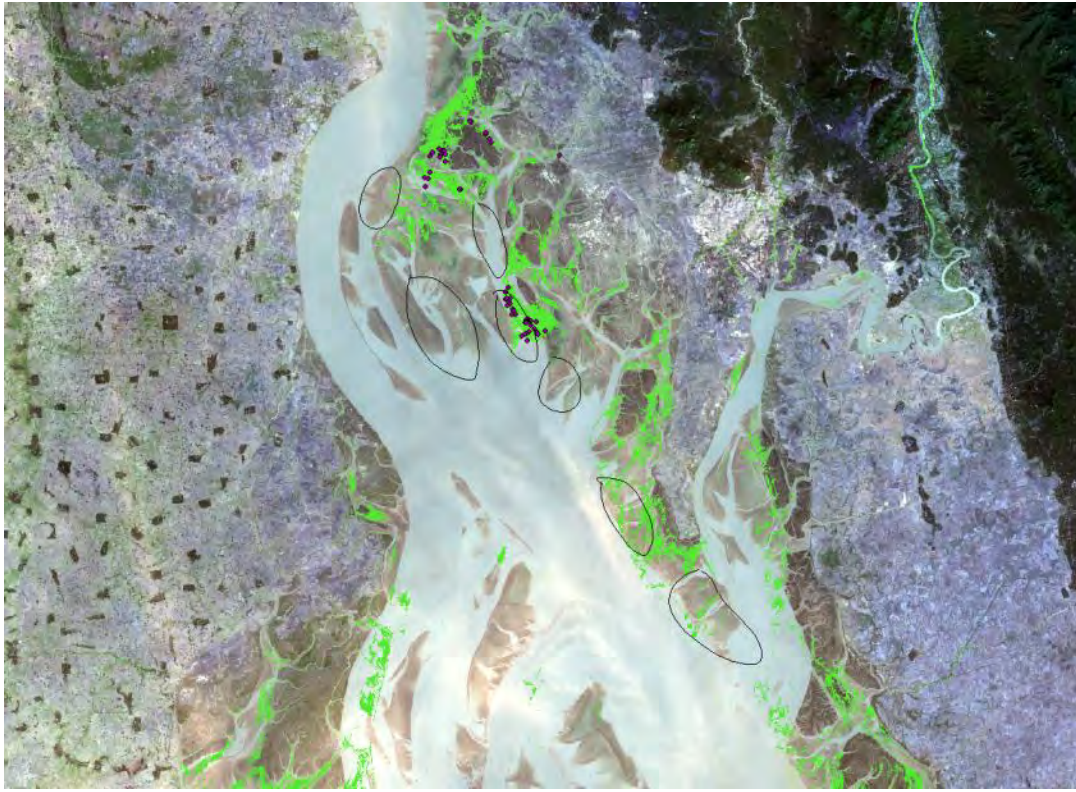
Annex: 6 Upper Gulf of Mottama Satellite images



Early 2014



Autumn 2015



Early 2016