Final Report

Conserving migratory waterbirds and their habitat in Pangpang Bay Essential Ecosystem Area (EEA), Banyuwangi, East Java, Indonesia

Report to The East Asian-Australasian Flyway Partnership (EAAFP)

Reported by

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Acknowledgment

We would like to thank the East Asian Australasian Flyway Partnerships Small Grant Fund for supporting us financially to make this survey and monitoring project possible. We also thank the management of the pangpang bay essential ecosystem area for their cooperation in this project. We would like to thank Iwan Febrianto from EKSAI Foundation and Waskito Kukuh Wibowo from Birdikari for being the resource persons in the capacity-building activities for the participants of the training on identification and observation of migratory shorebirds in Teluk Pangpang. Lastly, we also thank the elementary school for permitting us to carry out environmental education activities related to waterbirds and their habitats to students. Hopefully, what we do in Teluk Pangpang can provide benefits for waterbird and habitat conservation efforts in Teluk Pangpang in the future.

Introduction

The wetland ecosystem is a transition area between terrestrial ecosystems and aquatic ecosystems (Mitsch & Gosselink, 2015). With such an area position, the wetland ecosystem has very diverse types of flora and fauna because it is a combination of the species that live in the two habitat types. Coastal wetlands include mangroves, sandy mud, tidal areas, estuaries, and artificial wetlands such as ponds (SNRA, 2004).

The Pangpang Bay area is one of the Wetland Ecosystem areas in East Java's Banyuwangi Regency. The designation of the Pangpang Bay area as an Essential Ecosystem Area, in accordance with the Decree of the Governor of East Java, Number 183/288/KPTS/013/2020 concerning the Designation of the Essential Ecosystem Area (EEA) of Pangpang Bay, Banyuwangi Regency, East Java Province, recognizes the area's important value for the conservation of biodiversity and its ecosystem.

The Pangpang Bay EEA is located in 2 (two) sub-districts covering four villages namely Kedungringi village and Wringinputih village, Muncar District and Kedunggebang village and Kedungasri village, Tegaldelimo District. Geographically the area is between 8 ˚27.052' - 8˚32.098' S and 114˚20.988' - 114˚21.747' E or is at the southern tip of the Bali Strait and the East Coast of East Java.

This area is an important habitat for several species of water birds in the coast of Banyuwangi. Several species are known to utilize mangrove areas as breeding sites. Based on the report from Alas Purwo National Park (2021), 25 species of waterbirds were recorded in this area, both migratory and non-migratory. Interesting records of migratory shorebirds found in this area including the Eurasian Curlew, Whimbrel (Protection by Indonesian Law), Common Greenshank, Black-headed Stilt, Great Knot (Endangered), and other shorebird species annually using the Pangpang Bay for stop-over and foraging during their migration.

Conservation activity of the migratory waterbirds in East Java, especially in Banyuwangi Regency, is still little and mostly in Central and Western Java, as well as conservation agents such as birdwatchers, scientists, and ornithologists are concentrated in Central and Western Java. Furthermore, considering the importance of conserving the waterbirds and their habitat, the proposed project for waterbird conservation in this area is very important through the survey activities on the species abundance of waterbirds in the Pangpang Bay EEA. In the future, we think this activity can work with several stakeholders such as the Alas Purwo National Park and the Management of Pangpang Bay EEA.

In this proposed project, we will carry monitor the migration seasons and identify potential threats that can be carried out throughout the year. Thus, we not only obtain waterbird data on the number, population trends, and local movement patterns of more than 25 species of waterbirds in Pangpang Bay EEA but also can be documenting how birds can respond to changes in their habitat. All survey data collected during the project will be

shared with the Pangpang Bay EEA management and other key stakeholders, along with a list of recommendations for conservation management.

Furthermore, our community-level approach will promote waterbird conservation through community capacity building and other awareness-raising activities at schools and universities in the area to raise future knowledge and awareness for the conservation of waterbirds and their habitat in the Pangpang Bay EEA.

Objective

The main objectives of this activities are;

1) To monitor the number and species of waterbirds during shorebird migration seasons in Pangpang Bay Essential Ecosystem Area.
2) To increase the capacity and knowledge of the local communities as waterbird conservation agents in Banyuwangi, East Java.
3) To improve public awareness of Pangpang Bay Essential Ecosystem Area as an important site for waterbirds.

Method

Identification training and field trip for the waterbird survey method was conducted on the first of October in collaboration with the University of 17 August 1945 Banyuwangi for two days. The first day was a presentation of training materials and the second day was the practice of direct observation of shorebirds in Teluk Pangpang Area.

Figure 1. Survey location in Pangpang Bay, Banyuwangi, East Java Province

For shorebirds and waterbirds survey was conducted from the first of October until the 3rd week of December 2023.

Species were counted and identified directly using a monocular and binoculars. Each team member has the responsibility to scan directly and quickly using binoculars from a radius of 100-200 m from the observer point. The survey is conducted at the outside of

mangrove area, which has a coastal stretch of sandy and muddy. In addition, surveys were also conducted from the sea using boats.

Figure 2. Survey location in Pangpang Bay, Banyuwangi, East Java Province

Figure 3. Survey team member scanning a flock of shorebirds

Species identification we followed field guides of Waterbirds of ASEAN by Woo-Shin Lee et al 2018; Birds of Indonesia Archipelago by Eaton et.al 2022 (Indonesian version), and the Field Guide to the Birds of Indonesia; Greater Sundas by Taufiqurrahman et al 2022.

Result

A. Identification training and field trip for waterbird survey method.

Capacity-building activities for community groups and students in Banyuwangi were carried out over two days, 21-22 October 2023, at the campus of the University of 17 August 1945 Banyuwangi. This activity involved several parties such as the Pangpag Bay Ecosystem Essential Secretariat, Environmental Services of Banyuwangi Regency, Branch of Banyuwangi Forestry Services, Saka Wana Bhakti, and the Fishery Community Group from Pangpang Bay, Banyuwangi. The total participant of this activity was 30 participants.

The purpose of this activity is to introduce to the community groups in general and students in Banyuwangi. It is expected that this activity will grow community groups concerned in waterbirds and shorebird conservation efforts, and their habitats in Banyuwangi wetland areas.

On the first day of the training, 3 resource persons presented material on identification and survey technical methods for migratory waterbirds and shorebirds, including;

1) The important value of Pangpang Bay as a habitat for migratory waterbirds and shorebirds and its role in sustainable community economic development by M. Mahmudh from the Banyuwangi District Forestry Service Branch.
2) Introduction to migratory shorebirds and their conservation efforts in Indonesia by Iwan “Londo” Febrianto from EKSAI Foundation.
3) Identification techniques and survey methods for waterbirds and shorebirds, and reporting methods by Waskito Kukuh Wibowo.

Figure 3. Iwan Londo from EKSAI Foundation presents on migratory shorebirds

Furthermore, the participants who participated in this activity had never been trained and involved in capacity-building related to waterbird and shorebird conservation efforts, especially in Banyuwangi. The training and capacity building we organized was the first activity in Banyuwangi with the theme of waterbird and shorebird conservation and their habitats.

Figure 4. a) *Explain the use of online applications for bird observation reporting systems., b) Participant from various background., c) Mr. Mahmud from Forestry and Environmental Services Branch of Banyuwangi explain about the Pangpang Bay Ecosystem Essential.*

On the second day, capacity-building and training activities were carried out by observing/shorebird-watching and waterbirds at Cemara Mangrove Beach in Muncar Sub-district, 35 kilometers from the town of Banyuwangi or from the Campus of the University 17 August 1945 Banyuwangi. The participants were guided directly by the trainer in learning to scan for birds and identify the species of shorebirds found by themselves. We used two spotting scopes the Kowa TSN 4 and Celestron M2 80 ed and binoculars. In addition to learning to identify birds at the observation site, participants were previously taught how to use birdwatching equipment such as binoculars and spotting scopes. To facilitate the delivery of training, participants were divided into three groups, with each group accompanied by one guide.

Guided by the training resource persons, participants were able to identify 10 species of birds, both migratory and native to the area. Guided by the training resource

persons, participants identified 10 species of birds, both migratory and native to the area, including six species of shorebirds, two species of waterbirds and two species of seabirds.

Figure 5. *a) students scanning waterbirds and shorebirds. b) Two students compared the species findings at the observation site with the help of FieldGuide., c) Group discussion after the completion of all the activities of the two-day training course on capacity building in bird identification.*

Based on the participants' feedback, the two-day activity proved to be highly beneficial in enhancing their understanding of the environment, particularly migratory shorebirds in Banyuwangi. They expressed satisfaction with the opportunity to expand their knowledge and network with individuals from various organizations and universities.

B. Waterbirds Survey and Counting

Shorebird surveys were conducted in Pangpang Bay Banyuwangi from October to December 2023, with 27 days spent in the field. The surveys were conducted in the tidal area and ponds around the beach. In addition, observations were made using boats at high tide to determine the species of seabirds that use the fishing platform, also known as Bagang. Observations were also made from the sea to identify shorebirds that were not visible from the shore.

Species richness and abundant

The total number of waterbirds was 13245 individuals of 43 species (table 1). Family Scolopacidae has the highest of composition of species with 18 species, followed by Charadriidae 9 species, Ardeidae 6 species, Laridae 6 species, and Recurvirostridae, Glareolidae, Phalacrocoracidae, and Freatidae (1 species).

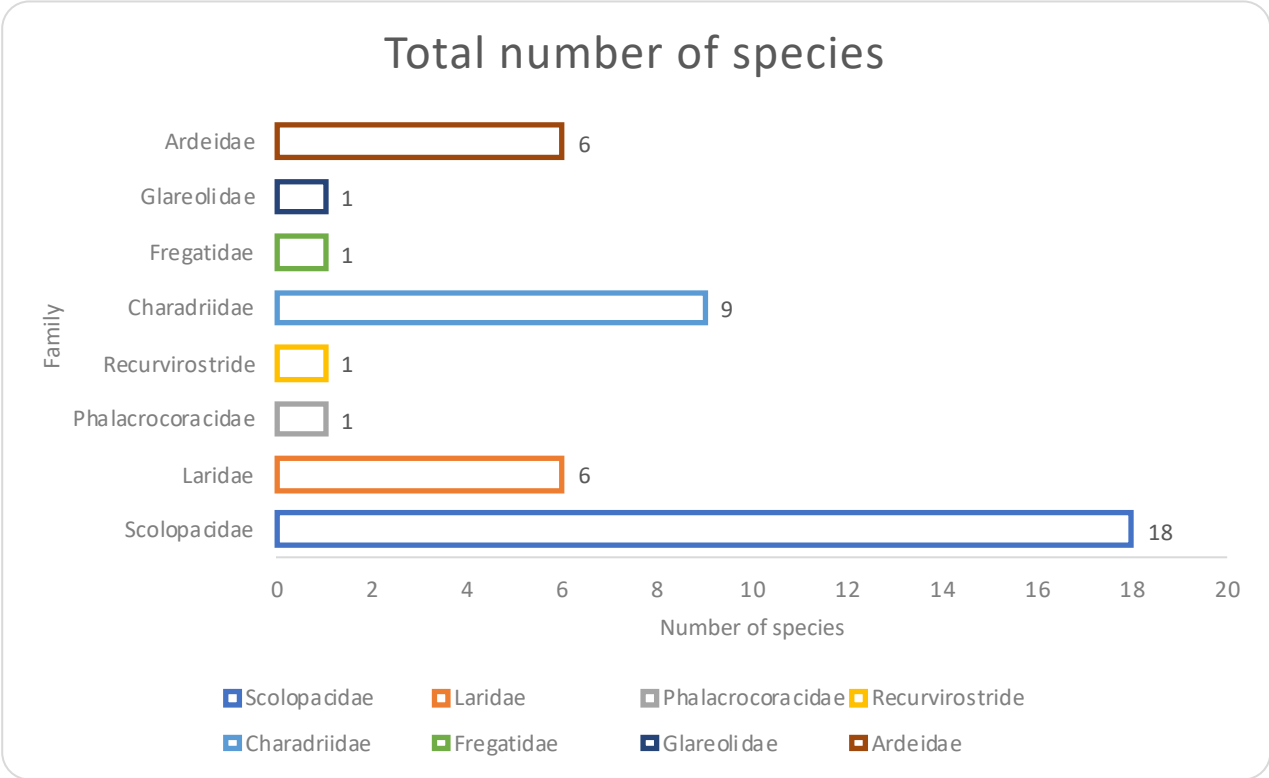

Figure 6. Graphic of the total number of waterbird species in Pangpang Bay, Banyuwangi.

Table 1. Waterbirds are counted in the Pangpang Bay Ecosystem Essential Area, Banyuwangi, East Java Province.

Common Name	Oct			Nov		Des		Total Number
	W-II	W-III	W-IV	W-III	W-IV	W-I	W-II	
Intermediate Egret	18	39	41	3	98	65	206	470
Javan Pond Heron	195	284	270	75	138	43	51	1056
Cattle Egret	0	0	0	0	0	0	1599	1599
Striated Heron	4	4	1	2	4	0	5	20
Little Egret	211	349	259	98	187	95	219	1418
Pacific Reef Heron	1	1	1	0	0	0	2	5
Black-crowned Night-heron	0	42	0	0	3	2	0	47
Tibetan Sand Plover	59	5	7	102	142	61	53	429
Siberian Sand Plover	0	0	4	0	0	2	0	6
Kentish Plover	0	0	0	0	11	12	0	23
Little Ringed Plover	0	0	0	4	4	0	0	8
Javan Plover	4	125	117	102	118	28	1	495
Greater Sand Plover	0	0	11	53	71	25	49	209
Pacific Golden Plover	0	204	368	90	136	16	0	814
Black-bellied Plover	0	0	0	5	8	0	0	13
Oriental Pratincole	0	0	0	31	0	0	0	31
Pied Stilt	0	0	0	4	4	0	0	8
Common Sandpiper	90	77	54	17	27	8	13	286
Ruddy Turnstone	0	1	3	3	5	0	0	12
Sanderling	0	2	6	2	4	0	0	14
Curlew Sandpiper	1	0	0	5	5	0	0	11
Red-necked Stint	23	49	49	8	8	0	0	137
Long-toed Stint	0	0	0	1	1	0	0	2
Great Knot	0	0	0	0	2	0	0	2
Black-tailed Godwit	0	10	148	40	14	0	0	212
Far Eastern Curlew	0	0	0	12	14	5	0	31
Eurasian Curlew	0	0	0	10	10	0	0	20
Eurasian Whimbrel	205	99	108	158	290	82	604	1546
Little Curlew	0	0	2	0	0	0	0	2
Grey-tailed Tatler	0	10	12	0	9	6	3	40
Wood Sandpiper	1	12	242	148	163	8	3	577
Common Greenshank	15	45	60	31	97	25	17	290
Common Redshank	0	21	5	46	75	32	14	193
Mars Sandpiper	0	2	3	5	6	0	0	16
Terek Sandpiper	0	5	9	4	4	0	0	22
Great Frigatebird	0	1	11	0	0	0	0	12
Gull-billed Tern	10	11	6	9	9	0	4	49

Common Tern	1	3	7	6	24	19	23	83
Little Tern	0	0	0	0	3	0	6	9
Lesser Crested Tern	0	0	0	0	2	0	7	9
Great Crested Tern	170	485	705	350	529	101	640	2980
White-winged Tern	0	0	0	0	16	0	21	37
Little-black Cormorant	0	0	1	0	1	0	0	2
Grand Total	1008	1886	2510	1424	2242	635	3540	13245

From the composition of Waterbird species group, 3 species from Ardeidae family with high number of individuals are Javan Pond Heron 1056 individuals, Eastern Cattle Egret 1599 individuals, and Little Egret 1418 individuals. In addition to the high number of individuals, the Pangpang Bay area is a breeding area for them. This then attracted the attention of people in the region to develop natural phenomena into natural tourism attractions by making the species an icon of Wringin Putih village tourism, especially in Pangpang Bay.

Figure 7. Cattle Egret was observed incubating its eggs in a nest built in a Mangrove tree, in the Kili-kili area of Teluk Pangpang.

Considering that the presence of waterbird breeding groups in the area could benefit the economic development of the community through eco-tourism bird-watching

activities, the community-based business group has developed the area as a tourist site and protection of waterbirds in the area.

The total number of migratory shorebirds found was 29 species from three Family (Scolopacidaem Recurvirostridae, Glareolidae) Figure 6. The species with the highest number was the Eurasian Whimbrel with 1546 individuals, followed by the Pacific Golden Plover with 814 individuals, Wood Sandpiper 577 individuals, Tibetan Sandplover 429 individuals, and Javan Plover 495 individuals. The record of Javan Plover is particularly interesting, as we have never seen such a high number of individuals of this species.

Table shorbirds abundant recorded in Pangpang Bay, Banyuwangi, East Java

No	*Scientific Name*	Common Name	Total Count	1% of EAAFP population	% of EAAFP Population
1	*Anarhynchus atrifrons*	Tibetan Sand Plover	429	900	0.47667
2	*Anarhynchus mongolus*	Siberian Sand Plover	6	900	0.00667
3	*Charadrius alexandrinus*	Kentish Plover	23	1000	0.02300
4	*Charadrius dubius*	Little Ringed Plover	8	1500	0.00533
5	*Charadrius javanicus*	Javan Plover	495		
6	*Charadrius leschenaultii*	Greater Sand Plover	209	2000	0.10450
7	*Pluvialis fulva*	Pacific Golden Plover	814	1200	0.67833
8	*Pluvialis squatarola*	Black-bellied Plover	13	800	0.01625
9	*Glareola maldivarum*	Oriental Pratincole	31	20000	0.00155
10	*Himantopus himantopus*	Pied Stilt	8	250	0.03200
11	*Actitis hypoleucos*	Common Sandpiper	286	250	**114.400**
12	*Arenaria interpres*	Ruddy Turnstone	12	300	0.04000
13	*Calidris alba*	Sanderling	14	300	0.04667
14	*Calidris furreginea*	Curlew Sandpiper	11	900	0.01222
15	*Calidris ruficollis*	Red-necked Stint	137	4750	0.02884
16	*Calidris subminuta*	Long-toed Stint	2	2300	0.00087
17	*Calidris tenuirostris*	Great Knot	2	4250	0.00047
18	*Limosa lapponica*	Black-tailed Godwit	212	3250	0.06523
19	*Numenius arquata*	Eurasian Curlew	20	400	0.05000
20	*Numenius madagascariensis*	Far Eastern Curlew	31	350	0.08857
21	*Numenius minutus*	Little Curlew	2	1100	0.00182
22	*Numenius phaeopus*	Eurasian Whimbrel	1546	650	**237.846**
23	*Tringa brevipes*	Grey-tailed Tatler	40	700	0.05714
24	*Tringa glareola*	Wood Sandpiper	577	1300	0.44385
25	*Tringa nebularia*	Common Greenshank	290	1100	0.26364
26	*Tringa stagnatilis*	Mars Sandpiper	16	1000	0.01600

27	*Tringa totanus*	Common Redshank	193	750	0.25733
28	*Xenus cinereus*	Terek Sandpiper	22	500	0.04400

Note: criteria for the shorebird population is derived from Bamford et.al (2008) and Hansen et.al (2016).

Based on the results, there are 2 species of shorebirds which more than 1% of the EAAFP population, they are Whimbrel (2,3%), and Common Sandpiper (1,1%). Based on our observations in the field, the habitat type for migratory shorebirds in Pangpang Bay is tidal beaches with muddy and sandy substrate types. With such substrates, the Pangpang Bay area is a place with abundant food sources for migratory shorebirds in the eastern tip of Java Island.

Species protection by Indonesian Law

Based on our result, 10 species are protected by Indonesian Legislation (P.106/MENLHK/SETJEN/KUM.1/12/2018) including;

1) Great Crested Tern *(Thalasseus bergii),* LC
2) Lesser Crested Tern *(Thalasseus bengalensis),* LC
3) Little Tern *(Sternula albifrons),* LC
4) Far Eastern Curlew *(Numenius madagaraiensis),* EN
5) Whimbrel *(Numenius phaeopus),* LC
6) Little Curlew *(Numenius minutus),* LC
7) Eurasian Curlew *(Numenius arquata),* NT
8) Javan Plover *(Charadrius javanicus),* VU
9) Kentish Plover *(Charadrius alexandrius),* LC
10) Great Frigatebird *(Fregata minor),* LC

Figure 8. Far Eastern Curlew in Pangpang Bay, 23 November 2023

C. Environmental Education

Environmental education to introduce the potential diversity of migratory waterbirds and shorebirds in Pangpang Bay to the younger generation, especially school students, was conducted in five elementary schools around Pangpang Bay. This activity was conducted from November 27 to December 2, 2023. The target number of students involved in this activity is 100 students. Based on the target number of students involved in this activity, we managed to involve 150 students from elementary school as a participant and six students from the local university who helped make this environmental education activity a success.

Table . Name of School and number of students.

NO	Name of School and Village	Number of Students
.	State Elementary School 1 of Kedungringin Village	35 students
2	State Elementary School 2 of Wringinputih Village	31 students
3	State Elementary School 3 of Wringinputih Villages	30 students
4	State Elementary School 5 of Kedungasri Village	22 students
5	MI Miftahul Ulum 3	32 students
	Total	**150**

Environmental education in schools is carried out through presentation methods and active interaction. The presentation material is tailored for elementary school students who are the target of this activity. In general, the material presented is related to the ecosystem of the Pangpang Bay area and the diversity of waterbirds in the area. The material was presented for about 15 minutes and was followed by a game to identify bird species commonly found in Pangpang Bay. The learning media used were posters/pictures of bird species made into crowns that could be worn around the head of each student who participated in this activity. The students then matched the picture of the crown with an identification book to find out which species they had chosen. The species used as learning media are the Common Sandpiper, Common Redshank, Eurasian Whimbrel, Bar-tailed Godwit, Greated Sandplover, and Red-necked Stint.

Figure 8. Presentation

Figure 9. The students learn how to identify shorebirds using printed images of bird species.

Conclusion and Recommendations

The total number of waterbirds counted in Pangpang Bay during the project are 13.245 individuals of 43 species which are 10 species are protected by Indonesian Legislation (P.106/MENLHK/SETJEN/KUM.1/12/2018), and one is Endangered by IUCN Redlist (Far Eastern Curlew). Based on the results obtained from this project, it is known that the Pangpang Bay area is an important habitat for migratory and protected waterbirds and shorebirds. Additionally, the Teluk Pangpang mangrove forest serves as a breeding site for Eastern Cattle Egret, Javan Pond Heron, and Little Egret.

Capacity-building activities for the youth generation, particularly students in the Banyuwangi area, can serve as a media campaign to conserve migratory waterbirds and shorebirds in Banyuwangi. In addition, environmental education activities have been conducted in schools around Pangpang Bay to provide knowledge on the importance of the area for waterbirds in general.

Overall, this project has to give the benefit and supported several of key outputs in the conservation of waterbirds and their habitat including:

1) KRA. 1.5. Partners and local stakeholders are engaged in responding to activities which may threaten Flyway Networks Site.
2) KRA 3.1. National monitoring system to assess the status of migratory waterbirds and their habitats are establish maintained and further enhanced.
3) KRA 4.1. EAAFP promotes the use of the range of available training tools and provides assistance to address challenges at Flyway Network Sites.

Furthermore, from the results of this activity we recommend that the management of Teluk Pangpang KEE routinely carry out several activities including;

1) Conduct in-depth studies on the ecology of waterbirds and their habitats in Teluk Pangpang.
2) Involve local communities in regularly monitoring waterbirds in the area.
3) Creating strategy and planning documents for waterbird conservation efforts and their habitats in Pangpang Bay.
4) Continue to conduct environmental education campaigns to sensitize the community on the importance of Teluk Pangpang for birds and as an alternative source of economic income for the community.

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Appendix 1. Financial Report

We get support from EAAFP Small Grant Fund 2023 with a total 4866 USD for this project.

Item	Total	BISA	EAAFP
Equipment (rent camera, binocular, spotting scope)	872	504	368
Consumable items (consumption for training, education program, field survey)	2189	99	2090
travel, accomodation, communication (car rent, bus for training, boat rent and motor cycle rent for survey)	2378	579	1799
Printing, Stationary, & Batterry (printing modul and tools for education)	298	26	273
disemination & publication (printing poster for expose result to stakeholder)	132		132
other (salary for local guide (EAAFP) and fee project leader, expert training, design poster (BISA))	606	407	199
medic	20	20	0
Total	4861		4861
Received	4866		
Difference	5		

Appendix 2. The Survey site in Pangpang Bay, Banyuwangi

Habitat types of migratory waterbirds and shorebirds in pangpang bay essential ecosystem area

Appendix 3. The photographs of shorebirds from Pangpang Bay

a) Greater Sand Plover

b) Lesser Crested Tern

c) Bar-tailed Godwit

d) Common Redshank

e) Terek Sandpiper with plover

f) Rudy Turnstone

Appendix 3; continued

g) Flock of Tibetan Sand Plover

h) Flock of Tibetan Sand Plover

i) Far Eastern Curlew

j) Flock of Eurasian Whimbrel

k) Little Curlew among the plastic trash

l) Little Curlew among the plastic trash

Appendix 3; continued

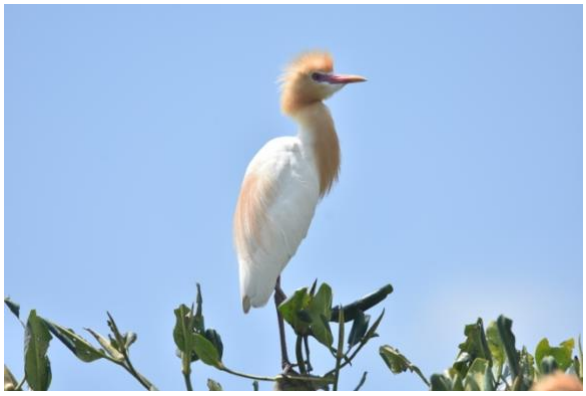
m) Great Crested Tern

n) Gull-billed Tern

o) Intermediate Egret

p) Great Egret

q) Little Black Cormorant



r) Cattle Egret in breeding plumage

Appendix 4; Documentation all of activities

Observing the shorebirds with studen

Seabird and shorebird survey from a boat

Appendix 5; environmental education

Environmental education about the waterbirds in elementary school

Playing cards and guessing the species of bird on the card

Appendix 6; Poster for the dissemination of information on the diversity of waterbird species in Teluk Pangpang.

"Preserve waterbirds and their habitats for better environmental quality"

BISA INDONESIA, 2024