Short Communication: A Rapid Assessment of Vertebrate in Pasir Timbul-Sungsang IV, Banyuasin, South Sumatra, Indonesia

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Abstract. The mangrove forest in Pasir Timbul, Sungsang IV Village, Banyuasin Regency, part of mangrove area within the Air Telang Protected Forest Area, is experiencing pressure from changes in land cover. A rapid survey to determine the vertebrate diversity in Pasir Timbul, at the tip of the Air Telang Protected Forest area was conducted in early June 2023. The purpose of the survey is to propose species priority in conservation within context species and habitat management plan. Vertebrate surveys were carried out rapidly using several methods adapted to certain taxa levels, namely amphibians and reptiles, fish, birds and mammals. Priority for fauna conservation in the Air Telang Protected Forest (study area) for reptiles: *Crocodylus porosus* (Protected under Indonesian law), Fishes: *Eleutheronema tetradactylum* (Endangered by IUCN), Birds: *Anhinga melanogaster* (Protected), *Haliastur indus* (Protected), *Microhierax fringillarius* (Protected), *Rhipidura javanica* (Protected), and Mammals including the long-tailed macaque *Macaca fascicularis* (Endangered), langurs *Trachypithecus cristatus* (Vulnerable), and *Prionailurus* sp. Conservation efforts need to be increased because this area as buffer zone of Berbak Sembilang National Park, having high carbon absorption, and provide a breeding ground for fish, shrimp and crabs. It is clear the site is habitat for various fauna (including protected ones), as well as other ecological functions such as breaking waves, resisting seawater intrusion and abrasion.

1 Introduction

Indonesia is a country with the widest distribution of mangrove ecosystems in the world [1]. The area of the mangrove ecosystem currently reaches 3.364.080 hectares [2]. South Sumatra has the second, after Riau, widest distribution of mangroves in Sumatra covering an area of

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up to 150.000 hectares. Mangrove forest continue to experience degradation and deforestation. The average mangrove deforestation in Indonesia from 1980-2005 was 52.000 hectares per year [2]. In the last 10 years, the main causes of conversion and deforestation of mangrove ecosystems are for the opening of ponds, either directly or indirectly, expansion of agriculture or plantations, and infrastructure development [3].

The mangrove forest in Pasir Timbul, Sungsang IV Village, Banyuasin Regency, part of mangrove area within the Air Telang Protected Forest Area, is also experiencing the same pressure. Areas that have been designated as Protected Forests according to the Decree of the Minister of Forestry No. 866/Menhut-II/2014 concerning Forest Areas and Marine Conservation of the South Sumatra Province is experiencing pressure from changes in land cover. Mangroves in the coastal area of Banyuasin have changed into swamps, open land, ponds, rice fields and shrubs [4]. Conversions carried out by the community that occurred in the mangrove forest in the region were into coconut plantations, fishponds, settlements and agricultures [5, 6].

One of the indicators of disturbed mangrove forest in the region is *Nypa fruticans* invasion in almost all zones, from tidal zone to near land zone [7]. The large increase in open area and coconut plantation has the consequence of decreasing the area of primary forest and secondary forest. The remaining primary and secondary forests in 2020 are only around 23.19% and 8.87% of the total area of Air Telang Protected Forest [6]. Primary forest in this area is dominated by true mangrove stands, such as *Nypa fruticans, Rhizophora apiculata, Avicennia alba, Bruguiera cylindrica, Excoecaria agallocha*, *Sonneratia alba*, *Sonneratia casiolaris* and *Xylocarpus granatum*.Meanwhile secondary forest contains a mixture of shrubs and mangroves [5, 7, 8]. and Despite many reports on the condition of the ecosystem from the aspect of the structure and composition of the mangroves in this area, no one has documented the terrestrial fauna community, especially vertebrates. This study reports the results of a vertebrate survey on taxa of amphibian and reptile, fish, birds, and mammals as baseline data on vertebrate diversity for further area management.

2 Material and Methods

Rapid fauna surveys were conducted using various methods tailored to certain taxa including herpetofauna (amphibians and reptiles), fish, birds, and mammals. These survey methods were adapted from Yustian et al. [9] and were carried out in the Pasir Timbul area, Sungsang IV, Banyuasin, South Sumatra, Indonesia **(**Figure 1). The mangrove ecosystem in this region is of particular interest due to its significant biodiversity and the ongoing challenges of degradation and deforestation.

Amphibia and Reptile (Herpetofauna): Using the Visual Encounter Survey (VES) method. Observations and sampling were carried out in the morning (07.00-10.00) and in the evening (19.00-22.00).

Fishes (Pisces): Collection of fish species was carried out along the river/water route. in sampling location. The sampling time around 06.00-09.00 in the morning and in the afternoon at 15.00-18.00.

The collection have been carried out by direct methods using equipment such as fishing rods, nets, scoops, and other fishing gear and indirectly by interviews to gather information from residents.

Birds (Aves): The bird survey was carried out by combination of boat survey and transect line. The survey was conducted between 06.00-09.00 in the morning and in the afternoon at 15.00-18.00.

Mammals: Observation of mammals was carried out using the Transect Reconnaissance method between 06.00-09.00 in the morning and in the afternoon at 15.00-18.00., which is a method of observing moving along the habitat in a certain direction to observed the mammals in the form of tracks, excrement, scratches, and/or sounds. Live traps (life traps)were applied for capturing small mammals such as mice and squirrels.

Fig. 1. Maps of survey location in Pasir Timbul-Sungsang IV, Banyuasin, South Sumatra

Species Identification and Validation References: We use further references for identification and validation; *A Field Guide to the Mammals of Borneo* [10], *A Field Guide to the Mammals of South-East Asia* [11], Burung-Burung di Sumatera, Jawa, Bali dan Kalimantan [12], *Birds of the Indonesian Archipelago, Greater Sundas and Wallacea* [13], Panduan Lapangan Burung-Burung di Indonesia Seri 1: Sunda Besar [14], *Freshwater Fishes of Western Indonesia and Sulawesi* [15], Ikan-Ikan di Sungai Musi dan Pesisir Timur Sumatera Selatan [16]. Panduan Lapangan Amfibi Jawa dan Bali [17], *A Field Guide to the Reptiles of South-East Asia* [18], and Panduan Bergambar dan Identifikasi Amfibi Pulau Jawa [19].

3 Results and Discussion

3.1 Amphibia and Reptile (Herpetofauna)

Herpetofauna is a group of vertebrate animals consisting of reptiles and amphibians. Both are poikilotherm fauna and are sensitive to temperature, humidity and environmental changes. In addition, they also have a similar habitat and way of life. Based on the observations that have been made, 7 species of herpetofauna were found in the study location (Table 1). The observation successfully recorded six species of herpetofauna. One of which was protected under Indonesian law (Regulation of The Minister of Environment and Forestry Number P.106/2018). Referring to IUCN (the International Union for Conservation of Nature) status, all species found are categorized as Least Concern (LC).

Table 1. List of Herpetofauna observed in Sungsang IV

No	Scientific name	Common name	Conservation Status		
			IUCN	Indonesian law	CITES
1	*Crocodylus porosus*	Saltwater Crocodile	LC	DL	-
2	*Eutropis multifasciata*	Common Sun Skink	LC	TD	-
3	*Fejervarya cancrivora*	Crab-eatingFrog	LC	TD	-
4	*Takydromus sexlineatus*	Long-tailed Grass Lizard	LC	TD	-
5	*Hemidactylus frenatus*	Common House Gecko	LC	TD	-
6	*Varanus salvator*	Asian Water Monitor	LC	TD	-

Notes**:** LC= Least Concern, DL= protected, TD= unprotected

3.2 Pisces (Ikan)

Fish is a taxon that has the highest species diversity among all vertebrate animals. Fish (Pisces) are poikilothermic vertebrates that live in water and breathe with gills. The body of the fish can be divided into three parts, namely the head (caput), body (truncus), and tail (caudal). Research on the diversity of fish species has been carried out by many research institutes and universities in Indonesia, although the results are scattered in various places and are generally not intended for utilization or conservation. The results of identified fish species at the study location can be seen in Table 2.

Table 2. List of fish species observed in Sungsang IV

No	Scientific name	Common name	Conservation Status		
			IUCN	Indonesian law	CITES
1	Gobi spp.	Goby	-	-	-
2	*Periopthalmodon scholosseri*	Giant Mudskipper	LC	-	-
3	*Periopthalmus* sp.	Mudskipper	-	-	-
4	*Eleutheronema tetradactylum*	Four-finger Threadfin	EN	-	-
5	*Epinephelus* sp.	Grouper	-	-	-
6	*Hemirhamphodon* sp.	Halfbeak	-	-	-
7	*Mystus* sp.	Catfish	-	-	-
8	*Hippichthys spicifer*	Bellybarred Pipefish	LC	-	-

Notes: EN= Endangered, LC= Least Concern

Based on the results of observations and information from the residents regarding the existence of the species of fish around the rivers in study area, eight species were found. These include species that are commonly found in brackish waters and are generally consumption fish. Referring to the IUCN status, one species was found to be in the category of EN/endangered and two species categorized LC/Least Concern.

3.3 Aves (Birds)

The main characteristic of birds is feathers. Birds can be identified morphologically from the shape of the claws and the shape of the rostrum. Each group of birds has a different shape of rostrum and claws. The shape of the rostrum and legs provides information about the environment, habitat and type of bird food. We listed 20 species of birds in the study area (Table 3).

Table 3. List of birds observed in Sungsang IV

No	Scientific name	Common name	Location				Conservation Status		
			1	2	3	4	PP	IUCN	CITES
1	*Anhinga melanogaster*	Oriental Darter	1				DL	NT	-
2	*Egretta garzetta*	Little Egret		100	20	10	TD	LC	-
3	*Egretta intermedia*	Intermediate Egret		10	2		TD	LC	-
4	*Butorides striata*	Striated Heron	6	30	10	6	TD	LC	-
5	*Anas gibberifrons*	Sunda Teal		10	20		TD	NT	-
6	*Haliastur indus*	Brahminy Kite	3	2			DL	LC	II
7	*Microhierax fringillarius*	Falconet			1		DL	LC	II
8	*Alcedo* sp	Kingfisher			1		-	-	-
9	*Todiramphus chloris*	Collared Kingfisher	10	6	7	8	TD	LC	-
10	*Pelargopsis capensis*	Stork-billed Kingfisher	1		1		TD	LC	-
11	*Hirundo tahitica*	Pacific Swallow	10		10	10	TD	LC	-
12	*Dendrocopos moluccensis*	Sunda Pygmy Woodpecker	2	2	2	2	TD	LC	-
13	*Picidae unidentified*	Woodpecker	1		1		-	-	-
14	*Aegithinia sp*	h Iora	1		1		-	-	-
15	*Lalage nigra*	Pied Thriller		2			TD	LC	-
16	*Pellorneum rostratum*	Malayan Swamp Babbler				1	TD	NT	-
17	*Orthotomus ruficeps*	Ashy Tailorbird	2		2	2	TD	LC	-
18	*Rhipidura javanica*	Pied Fantail	2		1	1	DL	LC	-
19	*Oriolus chinensis*	Black-naped Oriole		1			TD	LC	-
20	*Zosterops simplex*	Swinhoe's White-eye	2		2		TD	LC	-
21	*Corvus enca*	Slender-biller Crow	1				TD	LC	

Notes:
1. Tj Carat river, 2. Tanjung Carat, 3. Sarang Elang river, 4. Near electricity tower
NT= *Near Threatened,* LC= *Least Concern*, DL= protected, TD= unprotected

During the study, we identified 21 bird species in the study area. Four of these species were protected under Indonesian law, including *Anhinga melanogaster*, *Haliastur indus*, *Microhierax fringillarius*, and *Rhipidura javanica*. According to the IUCN Red List, three of these species were classified as NT/near threatened, namely *Anhinga melanogaster*, *Anas gibberifrons*, and *Pellorneum rostratum*. Meanwhile, the remaining bird species were classified as LC/Least Concern.

3.4 Mammals

Mammals have an important role in the sustainability of forest ecosystems, including as seed dispersers, pollinators, prey for carnivores, and controlling insect populations. Mammals have an important function in nature, could maintain the diversity of forest plants and as agents in forest regeneration. Only four species of mammals were found, including long-tailed monkeys, grey langurs, forest cats and mangrove cat (Table 4).

Table 4. List of mammals observed in Sungsang IV

No	Scientific name	Common name	Conservation Status		
			IUCN	Indonesian law	CITES
1	*Macaca fascicularis*	Long-tailed Macaque	EN	TD	**-**
2	*Trachypithecus cristatus*	Silvery Lutung	VU	DL	**-**
3	*Prionailurus bengalensis*	Leopard Cat	LC	DL	II
4	*Prionailurus viverrinus*	Fishing Cat	VU	DL	II

Notes: EN= *Endangered*, VU = *Vulnerable*, LC (*Least Concern*), DL= protected, TD= unprotected

Fig. 2. *Macaca fascicularis* (left), *Trachypithecus cristatus* (middle) and track of *Prionailurus* sp. (right)

There are four species of protected mammals, i.e: *Macaca fascicularis*, which listed as EN/endangered by IUCN, *Trachypithecus cristatus* (grey langur) listed as VU/vulnerable, *Prionailurus bengalensis* (jungle cat), and *Prionailurus viverrinus* (mangrove cat) (Figure 2). The existence of species that are listed protected by IUCN or Indonesian law, indicates that the study area is still supportive habitat for vertebrates. Conservation efforts need to be increased because this area has high carbon absorption, breeding ground for fish, shrimp and crabs, as well as other ecological functions such as breaking waves, resisting seawater intrusion and abrasion.

4 Conclusions

Priority for fauna conservation in the Air Telang Protected Forest, i.e *Crocodylus porosus* (reptile, Protected under Indonesian law) *Eleutheronema tetradactylum* (Fish, Endangered by IUCN), Birds: *Anhinga melanogaster* (Protected), *Haliastur indus* (Protected), *Microhierax fringillarius* (Protected), *Rhipidura javanica* (Protected), and Mammals including the long-tailed macaque *Macaca fascicularis* (Endangered), langurs *Trachypithecus cristatus* (Vulnerable), and *Prionailurus* sp.

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