Wildlife species composition in various forest types on Sebuku Island, South Kalimantan

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Abstract. Sebuku is one of the small islands in South Kalimantan Provincehaving various forest types with high potential economic in mining sector. Based on it's business permit, the island has been divided up into several mining concessions. So that biological diversity studies in this island is an interesting in order to serve biological baseline data if someday this island to be extractedfor mining. This research was conducted on 28th November to 5th December 2015 aims to explore wildlife species inhabit mangrove forest, beach forest, and lowland forest usinga rectangle transect (40 x 1000 meter) in each forest type. The results show there are 90 wildlife species identified in Sebuku Island.The beach forest has the highest wildlife species richness (36 species), while the area having the highest protected wildlife species isthe lowland forest. Mangrove forests generally have a lower wildlife species richness. Nevertheless, in Sebuku Island, can be found mangrove forest that have a quite high wildlife species richness (28 species, 50% protected). It is due to silt sedimentation in the estuary area, so that this area become feeding ground for shore and migratory birds.

1. Introduction

Sebuku island is one of the small islands in South Kalimantan, having the area estimated at 245.5 km2. Geographically, the island located at between 4°09'27" – 4°05'35'' North Latitude and 117°031'39'' – 117°35'55" East Longitude. This island covers various vegetated land cover types which has important role for wildlife habitats. Furthermore, the island has abundance of coal and minerals. Based on it's business permit, the island has been divided up into several mining concessions.

A high potential of coal and minerals in Sebuku Island led to mineral exploration and mining activity. Mineral exploration and mining activity are contributed to increasing of foreign exchange of the country. However, the mining activities provide impact damage to wildlife habitat.

Continuously and uncontrolled mining activity could result in loss of wildlife habitat, that could cause further impact on the wildlife extinction. Hence the mineral potential of the abundant coal and minerals can be a threat to the existence of habitat and wildlife in Sebuku Island. So that biological diversity studies in this island is an interesting in order to serve biological baseline data if someday this island to be extracted for mining. The research was carried out to explore wildlife species inhabit three forest types (mangrove forest, beach forest, and lowland forest).

2. Methods

This research was conducted on 28th November to 5th December 2015 in three forest types (mangrove forest, beach forest, and lowland forest). In order to explore wildlife species, a rectangle transect (40 x 1000 meter) was constructed in each forest types.

3. Results

3.1   Various types of ecosystems on Sebuku Island

Based on Sebuku Island beach geomorphology, there are 3 Sebuku Island typologies: (1) mangrove area in the West and North of the island, (2) the coastal and the coral areain the East of the island, and (3) coral-mangrove area in the southern part of the island. If it is based on the existence of wildlife, the important ecosystems on the Sebuku island is divided into 6 ecosystem types (Figure 1). Thereare:

1. Primary mangrove ecosystem with mud substrate, this ecosystem is represented by a plot in the nature reserve of the Straits Sebuku precisely bordering SP 23B (village Serakaman). This Habitat is dominated by mangrove flora with high diameter and high canopyclosure. However, this region was once polluted by acid mine and in the central part of the region is used to be an embankment. The study also pointed out the existence of illegal logging activities in the area.

2. Primary mangrove ecosystem with coral substrate, this ecosystem is represented by a plot in Tanjung Karang. Habitat in this area is dominated by mangrove flora is a fairly tight on the edge but open on the middle section hence the canopy closure stillclose to each other. This area was polluted by waste oil that resulted in death of some plants in the central part. This occured because the observation location is near the coal transportatin port. In addition the presence of roads cutting mangrove forests lead to lack of tidal sea water reaching the middle part due to relying wall and embankment.

3. Secondarymangrove ecosystems represented by Selat Sebuku nature reserve in particular on the island of Sekapung, the village of Keluang and Sejakah Villages. Generally it is the area of mangrove forests on the outer side of the secondary especially on the north side of the island of Keluang. The presence of wood in order to capture the making of chart by people thought to be the cause of this ecosystem is degraded. The mangrove forest in the village of Sejakah is still experiencing growth characterised by a large number of still permudaan. The main thing that is causing the expansion of the vast area of mangroves in this area is the result of silting and sedimentation jedidah River which is a good media for mangrove plants. Unlike the acreage of Mangrove Forests in Sekapung where this area is located close to the settlement. Basically this area blends in with the acreage of mangrove forests in the Cape of the head, nevertheless in some locations in the forest can be found the former embankment by the community even though it is currently not in use, however the area still leftopen.

4. Coastal forest ecosystems are represented by ecosystems in eastern of SebukuIsland. Characteristic of this ecosystem is the ecotone zone that connected beach forest with secondary forest ecosystems. This area is stil in a good condition due to further distance community and mining activity. Presence of Clear water (on the Hill of Saung) and mystical area is one of the reasons why the area was protected by local community aside fromBeach forest role as coatal protectionyet on a beach part ,there is a sea sand mining used for the construction of the settlement by communities.

5. Lowland forest ecosystems generally merges with forest beach. This ecosystem is represented by the Bukit Saung. The area around West Bukit Saung was a HPH (logging) area. This area has also been occupiedby the community into a rubber plantations (Hevea sp.) without felling the tree. Currently, the rubber plantation is not well-managed, the community tend to exploit the land around their settlement becauseof the remote location and decreasing of rubber price.

6. Another ecosystem that is generally artificial ecosystems such as the plantation with a homogeneous rubber plant, agricultural fields and pastures with low diversity of fauna. In this region only viewed the portrait area but habitat analisys and Wildlife observation are not acomplished

3.2   Wildlife on Sebuku Island

In total 90 wildlife species belong to 40 families has been identified in Sebuku Island area, consist of 14 species of mammals (10 protected species), 67 species of birds (protected species) and 9 species of Reptiles (3 protected species). Therefore, it can be concluded that almost half of the species is a protected species (44 kind). The number of species found in each observation plot are presented in Table 1 while list of identified species in each plot presented in Table 2.

Table1. Number of wildlife species found in different plots in Sebuku Island

No	Location	Number of species			Protected			Total	
		Mammal	Birds	Reptile	Mammal	Birds	Reptile	Species	Protected
1	Lowland Forest Bukit Saung	9	19	2	6	10	0	30	16
2	Beach Forest Eastern part	5	27	4	3	10	1	36	14
3	Mangrove Pulau Keluang	0	8	2	0	3	0	10	3
4	Mangrove Sejakah	1	28	3	0	14	1	32	15
5	Mangrove SP. 23B	2	4	3	1	3	1	9	5
6	Mangrove Tanjung Kepala	2	14	1	1	3	1	17	5
7	Mangrove Desa Sekapung	1	14	0	0	5	0	15	5

Result shown that in Sebuku island area there was a suitable area for birds, reptile and some endanger and protected mammals. In some area of the island can be encountered forest area with high tree canopy for mammals and partly provide good nesting sites or foraging for birds. Based on the data on Table can be inferred that the birds group is the most widely observed while the reptile group is least identified. However, mammals are the most sensitive to changes in the environment and this indicates that these species have specific habitat requirements, unlike the reptile which tend to be unobserved because this group generally nocturnal.

In Sebuku area can be found mangrove and sediment, whose existence is very important for some of fish-eating birds species (Figure 1), such as Alcedinidae (Cekakak and Raja Udang), beach birds and Sea birds such as species includes in family Ardeidae, Anatidae, Burhinidae, Ciconiidae dan Scolopacidae. The existence of sediment are believed as effective natural traps because of the tides.
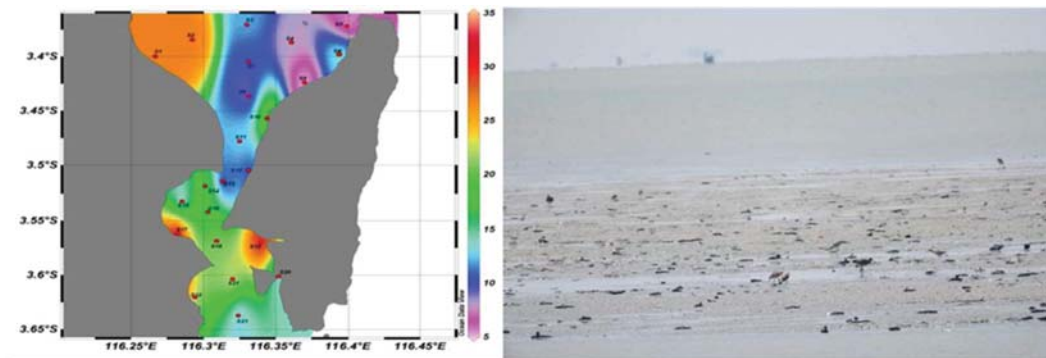

Figure 1. Distribution of the total surface of suspended solids in the Selat Sebuku (mg/l) and sample of feeding ground locations for Birds in Muara Sejakah

Field observasion result shown that Beach Forest area in East coast of the island and the Mangrove Forests Sebuku Sejakah has a high diversity than other observation plot. These condition rise to allegations that beach forest and mangroves are more stable than other observation plot. This is proved by the number of species that are able to adapt on the conditions and has interactions in the ecosystem.

3.3 Key Habitat in Sebuku Island

The "habitat "term is an axiomatic start from environment scope that its resources are really utilized by wildlife until the wide scale as a vegetation form in a landscape [1]. Tews et al. [2] defined the habitat as a division of a location that is generally based on the structure of vegetation formations. Different

with [3] which defines the habitat as the all resources and environmental conditions at a location that is able to maintain the survival and reproduction of organism. The more obvious habitat concept put forward by [4] by defining the habitat at 3 scales: (1) the location of organism live, (2) physical and chemical aspects of environment, and (3) the concept of community in habitats.

Habitat was the basis of a functional ecosystem, therefore this information is important in the wildlife utilization directly [5] as well as arranging spatial plan area [6].[7] States that the successes of wildlife conservation efforts depend on collecting, analyzing, and interpreting reliable information about the wildlife habitat.

Assessment a habitat become important to be protected or not, generally use the biodiversity approach. The measurement of biodiversity is the simplest way to count the amount of species [8, 9]. Understanding on levels of species was the basis in understanding biodiversity due to the level of species, almost universally used as units where biological diversity is measured [10].

The diversity of wildlife can be used to estimate biology quality such as environmental and ecological pollution of an ecosystem through the community structure (1984) and its monitoring. However that biodiversity only can describe community structure and ecological quality of an ecosystem so that only simplify and describe the real biodiversity. One of the important aspects in the study of biodiversity is that not all species found are the same. The species vary in amount, form, abundance, distribution, trophic position, ecology function, and food selection. Therefore, similarity index of community that incorporates species in it is more suitable to use in the determination of the key habitats in Sebuku Island.
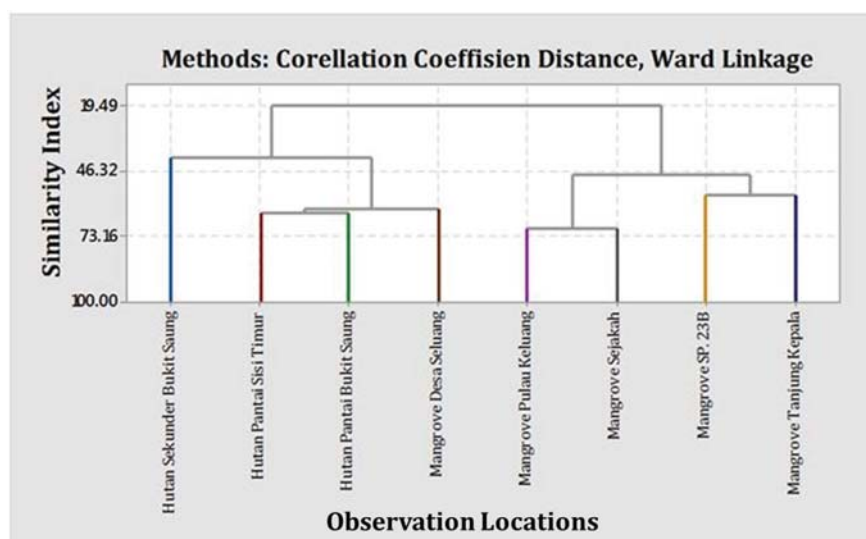

Figure 4. Similarity index of community at various locations on the Sebuku Island

Based on the level of community similarity showed that the each various observation location on the Sebuku Island have separate community characteristic and different with each other. The analysis result showed that the largest similarity index of community is only 70.04% namely Keluang Mangrove and Sejakah Mangrove Islands (Figure 2). This indicates that the entire ecosystem in the Sebuku island is a unique ecosystem and important so needs to be managed and maintained to keep it together. In this analysis can also note that factor of location proximity is at least gives implications on equal species though is not significant. It also showed that several species especially bird species using more than one type of location as Habitat.

Shorebirds and scaffolding birds use Keluang Mangrove as habitat for sleep while in the morning until in the afternoon these species foraging around the Mangrove Sejakah. The existence of embankment and fish trapped in the sediment makes it easy to find these species feed.

3.4   Potential Threats of Wildlife

Based on the definition of habitat on the previous section, each wildlife animal has its own characteristics; although perhaps on some species have similarities. Therefore, knowledge of the selected habitat characteristics can provide fundamental information about behavioral change as well as patterns of adaptation its physiology [11]. Wildlife needs in an environment can generally be divided into three, namely [12]:

1. Food and beverage to enhance nutrition/energy and
2. Shelter and protection to avoid themselves from predators and weather influences such as heat and rain
3. Space to get food, water and attract mates.

Several wildlife species in Sebuku Island is inseparable from the threat of its existence in nature. In the theory of biogeography, biodiversity size is equal with its wide island. In addition, over exploitation in the island caused the size of habitat become narrower due to conflict of utilizing interest in the small island. This cause wildlife habitat only concentrated on a very narrow area. This will cause the high intensity of threats to biodiversity, both natural and anthropogenic influences. Naturally the extinction can be caused by competition between individual and species in fighting over resources. There are various threats to the wildlife in the Sebuku Island, i.e.:

3.4.1   Coverage changes and Land Use

Land clearing activities undertaken by communities, usually use conventional pattern, where land burning is the most realistic and affordable because it is cheap and easily applied. This condition indicates that land clearing indirectly shows burning land activities. Many researchers believe that food quality is a limiting factor for many herbivores. Several species of primates give responses to the habitat changing due to forest fire, they found in large amount on the forest floor and choose certain food in primary forest or consume immature leaves and insect in large amount. This is due to losing of high tree as Enggang nest and a few fruit trees as food sources of Enggang.

The forest land clearing for development interests to increasing human living standard has led to wildlife population that used to be in its habitat becomes fragmented to find and occupy the remaining habitat. The remaining Habitat is typically relatively small area that is not supported by feed conditions. Based on the above conditions then it can be inferred that the existence of socio-economic dynamics of the society in General, will have an impact for wildlife, include:

a. The decline in biodiversity; Deforestation and forest degradation into gardens and fields will cause decreasing of the total of wildlife biodiversity. This is caused by two things, namely: (1) the inability of wildlife due to habitat changes became extinct in local and (2) natural habitat damage will force most some wildlife will migrate to the outside of its habitat to look for a better habitat.

b. Pest increasing; environment changes that are likely to lead to environmental damage due to environmental exploit that exceed environmental carrying capacity led to an imbalance of the ecosystem and resulted in a conflict of wildlife. Conflicts give rise to lack of human appreciation on the wildlife. Human activities in forest cause wildlife habitat be narrow and forcing wildlife to find new space to live and resulted in conflicts between the community and wildlife. The most frequent species of wildlife damage the fields and plant community is the long-tailed Macaca (*Macaca fascicularis*)and boar (*Sus scrofa*). Long-tailed Macaca (*Macaca fascicularis*) and boar included mammals species that easily adapt to its environment. Along with getting the narrowness of forest area, the role of this species is no longer as ecosystem stabilizers but as farmers enemy and can be source of pest in rice field and plantations. In communities field, both of them are damaging to the various species of commodities that became the object of economic society, including: corn (*Zea mays*), banana (*Musa paradisiaca*), cassava (*Manihot esculenta*), long beans (*Vigna sinensis*), palm oil (*Elaeis guinnensis*) and rubber (*Hevea braziliensis*). In addition, farm fields is also often used as a place for wildlife to play around that damage other crops despite the plants is not taken asfood.

c. Reducing wildlife populations; Forest fragmentation causes the size of the habitat and resources in it became limited. The limited food resources led to the low population density of animals especially

herbivores (First Consumers) who later also determine the existence of large carnivores (Second Consumers).In addition changes into the gardens and fields, the road network that was constructed to the gardens and fields also led to fragmentation on forest landscape. High levels of habitat fragmentation causes wildlife habitat become fragmented. This condition then makes the animals can't interact (social or reproductive) because each of them is isolated from other habitats. On the long term, at least showed decreasing in the wildlife population. The pattern of closed reproduction resulted in increasing inbreeding chances that result in decreasing in genetic variation and in some cases even gave rise to genetic disorders. While the limited amount of food will result in the competition process to obtain access to resources between individuals become very close. This means animals will often fight to gain access to resources compared to invest the rest of its energy for growth or breeding.

The vegetation is the main variable in quality habitat analysis and environment changes. McKinney M L [13] warns that the loss of habitat is the main cause of the alleged loss of biodiversity. As for the negative effects of habitat fragmentation include:

a. Abiotic component changes on fragmented habitats. This will result in mismatch environment for native wildlife. Further the fragmentation also results in modifications and changes to surrounding environment topography, increasing the noise intensity (degree of decibels increase), changes the dynamics and the water cycle as well as air [14].

b. The existence of a linear fragmentation (road construction) will have direct negative impacts to wildlife populations due to the increasing mortality rate for wildlife (accident), exotic species introduction (alien species) that will ultimately change the natural behavior fauna

c. The function of ecosystems may be disrupted due to habitat fragmentation due to the reduced capacity of the components in the ecosystem to sustain ecological processes that occur naturally, raises barriers to gene flow and the grouping of animals in a habitat.

The fragmentation in the short term will basically provide benefits for wildlife and plants or where there is a succession process and produce a fast crop especially for herbivores species. However, in the long term this condition will result in competition between wildlife and the individuals as well as increasing the chance of predation (natural as well as human). Based on a list of fauna species that can be found in plot observations on Sebuku Island, then adaptability of wildlife on cover changes and land used in Sebuku Island are as follows (Table 2).

Tabel 2. Wildlife Adaptability on Land Use

No	Wildlife Species	Land uses and changes						
		F	G	E	M	A	S	Sh
1	*Sus scrofa*	*****	****	*	**	****	***	***
2	*Callosciurus notatus*	*****	****	*	*	****	****	*****
3	*Lariscus insignis*	*****	***	*	*	*	*	**
4	*Nasalis larvatus*	*****	*	*	*	*	*	*
5	*Ratufa affinis*	*****	**	*	*	*	*	**
6	*Muntiacus muntjak*	*****	*	*	*	*	*	****
7	*Galeopterus variegates*	*****	**	*	*	*	*	**
8	*Nycticebus coucang*	*****	**	*	*	*	*	*
9	*Macaca fascicularis*	*****	****	*	***	***	***	****
10	*Tragulus kanchil*	*****	**	*	*	**	*	****
11	*Rusa unicolor*	*****	***	*	*	**	*	****
12	*Tarsius tarsier*	*****	**	*	*	*	*	*
13	*Tupaia glis*	*****	**	*	*	**	*	***
14	*Tupaia dorsalis*	*****	*	*	*	*	*	**

15	*Leptoptilos javanicus*	*****	*	****	*	*	*	***
16	*Psittacula alexandri*	*****	***	*	*	**	***	*
17	*Psittacula longicauda*	*****	****	*	*	**	*	*
18	*Gallinago sp.*	*****	*	**	*	*	*	**
19	*Ardeola speciosa*	*****	*	***	*	*	*	**
20	*Lonchura fuscans*	*****	****	***	****	****	****	*****
21	*Centropus bengalensis*	*****	****	*	*	**	*	****
22	*Passer montanus*	***	****	**	****	****	****	****
23	*Nectarinia calcostetha*	*****	****	*	*	**	***	***
24	*Nectarinia sperata*	*****	****	*	*	**	***	***
25	*Anthreptes malacensis*	*****	****	*	*	**	***	**
26	*Nectarinia jugularis*	*****	****	*	*	**	***	**
27	*Dicaeum trigonostigma*	*****	****	*	*	**	***	**
28	*Dicaeum ignipectus*	*****	****	*	*	**	***	**
29	*Hemicircus concretus*	*****	****	*	*	*	**	***
30	*Picoides moluccensis*	*****	****	*	*	*	**	***
31	*Ardea sumatrana*	*****	*	****	*	*	*	**
32	*Ardea purpurea*	*****	*	****	*	*	*	**
33	*Todirhamphus chloris*	*****	***	****	*	**	**	****
34	*Chloropsis sonnerati*	*****	****	*	*	**	***	*
35	*Chloropsis cyanopogon*	*****	****	*	*	**	***	*
36	*Orthotomus ruficeps*	*****	***	*	*	*	*	**
37	*Onychoprion fuscatus*	*****	*	***	*	*	*	*
38	*Sterna sumatrana*	*****	*	***	*	*	*	*
39	*Haliastur indus*	*****	****	*	**	***	***	***
40	*Icthyophaga ichthyaetus*	*****	*	***	*	*	**	**
41	*Haliaeetus leucogaster*	*****	*	***	*	*	**	**
42	*Numenius arquata*	*****	*	****	*	*	*	**
43	*Numenius phaeopus*	*****	*	****	*	*	*	*
44	*Lalage nigra*		*****	***	*	*	*	*	*
45	*Apus affinis*		***	****	**	*	***	*****	**
46	*Amaurornis phoenicurus*		*****	****	**	**	***	**	***
47	*Merops philippinus*		*****	*	***	*	*	*	*
48	*Butorides striatus*		*****	*	***	*	*	*	*
49	*Nycticorax caledonicus*		*****	*	***	*	*	*	*
50	*Copsychus saularis*		*****	***	*	*	*	*	**
51	*Egretta alba*		*****	*	****	*	*	*	**
52	*Egretta sacra*		*****	*	****	*	*	*	***
53	*Egretta garzetta*		*****	*	****	*	*	*	***
54	*Egretta intermedia*		*****	*	****	*	*	*	***
55	*Hirundo tahitica*		*****	****	***	*	***	***	***
56	*Pycnonotus goiavier*		*****	***	*	*	**	**	***
57	*Pelargopsis capensis*		*****	***	*	*	*	*	**
58	*Dryocopus javensis*		*****	**	*	*	*	*	**
59	*Ducula pickeringii*		*****	*	**	*	*	*	**

		F	G	E	M	A	S	Sh
60	*Geopelia striata*	*****	***	**	**	**	***	**
61	*Aplonis panayensis*	*****	***	**	**	**	***	***
62	*Treron fulvicollis*	*****	*	**	*	*	*	**
63	*Treron vernans*	*****	***	**	*	*	***	**
64	*Ceyx erithaca*	*****	***	*	*	**	**	*
65	*Alcedo atthis*	*****	***	*	*	**	**	*
66	*Alcedo euryzona*	*****	*	*	*	*	*	*
67	*Alcedo meninting*	*****	***	*	*	**	**	*
68	*Buceros rhinoceros*	*****	**	*	*	*	*	*
69	*Loriculus galgulus*	*****	***	*	*	**	**	***
70	*Cyanoptila cyanomelana*	*****	***	*	*	**	**	*
71	*Cyornis turcosus*	*****	***	*	*	**	**	*
72	*Pernis ptilorhynchus*	*****	***	*	**	***	***	*
73	*Gracula religiosa*	*****	****	*	*	**	**	****
74	*Actitis hypoleucos*	****	*	***	*	*	**	**
75	*Tringa erythropus*	****	*	***	*	*	**	**
76	*Collocalia linchi*	***	*****	**	****	*****	*****	****
77	*Collocalia esculenta*	***	*****	**	****	*****	*****	***
78	*Aerodramus maximus*	***	*	***	*	*	****	**
79	*Esacus magnirostris*	*****	*	***	*	*	*	*
80	*Cacomantis merulinus*	****	***	*	*	**	**	**
81	*Cacomantis variolosus*	*****	***	*	*	**	**	**
82	*Varanus salvator*	*****	***	**	**	**	**	***
83	*Crocodylus porosus*	*****	*	*	*	*	*	*
84	*Eutropis multifasciata*	*****	*****	*	*****	*****	*****	*****
85	*Eutropis rudis*	*****	*	****	*	*	*	*****
86	*Orlitia borneensis*	*****	*	**	*	*	*	**
87	*Gecko gecko*	***	***	*	*	*	****	*
88	*Boiga wallachi*	*****	***	**	*	*	*	**
89	*Ahaetulla prasina*	*****	****	*	*	***	***	***
90	*Cerberus rynchops*	**	*	*****	*	*	*	*

Source   : www.iucnredlist.org; www.animaldiversity.org; www.birdlife.org; www.reptile-database.org (processed).

Description: F = forest, G = gardens, E = embankment, M = mining A = agriculture, S = settlement, Sh = shrubs, * = not adaptable Animals; ** = low adaptability wildlife; = The ability of animals adaptation is quite good; = Adaptable Animals; = Highly adaptive Animals.

Based on the tables above, it can be noted that adaptability of wildlife to land use and cover changes are different from each other. In the Mammalia class, only boar (*Sus scrofa*), Palm squirrel (*Callosciurus notatus*) and long-tailed Macaca (*Macaca fascicularis*) that havehigh adaptability towards land use changes in Sebuku Island. Other mammals have low adaptability to land use changes, except on land use for plantation that have quite high density such as plantations and agroforestry. For example Bekantan (*Nasalis larvatus*) requires high density and high conopy coverage as well as sustainability as its habitat in order to make this species can move freely because it is arboreal species and also keep body temperature more stable. In addition, in the area should also contain a high diversity of plants

because of high plant diversity is a representation of amount of insects in it, which is the main feed of insects for Bekantan.

Unlike the bird class that has the ability of adaptation which tends to be random depends on a way of life. The species of scaffolding and shorebirds tend to be in the same group of mammals in general, i.e. has low adaptability to environment changes. Species of land mammals tend to be more adaptive on environmental conditions despite a low capability. On the class of reptiles, only species of Kadal Kebun (*Eutropis multifasciata*) and Ular Pucuk (*Ahaetulla prasina*) that have a high power of adaptation, while on the other species have specific habitat. This shows that adaptability is very low even several species do not tolerate land use and changes.

3.4.2   Illegal Logging
One of the activities that can decrease biodiversity of wildlife is illegal logging (Figure 8). Ilegal logging that had been identified in the natural reserve area which is directly adjacent to the PT. BCS in the west side on and on Keluang Island. The need of community in wood mainly to the needs of wood as the material for home and constructions will reduce the existence of some tree species which are natural feed for wildlife. If this condition occurs massively, then the species of natural feed will be reduced in high amount and the animals will suffer hunger and death. In addition, some types of trees which have large diameter, high height and high density of canopy which can provide the hive for animals, especially primates, and shorebirds. This condition will decrease the chances of wildlife to reproduce because of habitat disturbance.

3.4.3   Illegal Hunting
Direct threat to the diversity of wildlife on Sebuku Island is illegal hunting. Illegal hunting eliminates individu and species from its natural habitat. Basically, there are several categories of illegal hunting in Sebuku Island: (1) The hunt for hobbies (2) the hunt for reducing the population of animals that are considered as pests, (3) the hunt for economic motives. Illegal hunting for the hobby generally done by the community with motives. To fulfill the desire of hunting or poaching. Generally the species that are hunted are deer (Indian muntjac), various species of squirrels (Tupaiidae) and (Sciuridae) and also various species of birds that have various types of voice, shape and color. The short term hunting will not have a massive impact on biodiversity, however in the long term, hunting will decrease the wildlife diversity.

Different with hunting that aimed to reduce animal population. Basically, the purpose of this type of hunting is to keep wild animals for not disturbing the cultivated area. In this context, based on the legal aspects, hunting is permitted. Ecological functions of a species will appear when the animal's prey or predators increased the population to destructive and detrimental to humans. However, historical records show that the methods used are sometimes not in accordance with the rules of environmental preservation. It identified have occurred on the Laut Timur Island. When the migration season of birds, many migratory birds (shore bird), shorebirds and scaffolding are looking for fish in the community's embankment. This caused some embankment deliberately added with toxic (heavy metals) in high concentrations so that the bird population can be decreased.

Hunting for the economic motive is usually done by community who did wildlife trading. Some records show that the species of potential warbler can be traded. Moreover, Pangolin (Manis javanica), had become the animal target hunted in the area of Pulau Laut island because of its high economic value. This hunting model is certainly very dangerous, given the number of hunted and hunter motivation is proportional to the economic value of the hunted animal target.

4. Conclusion
Sebuku Island is covered by three forest types, mainly mangrove forest, beach forest, and lowland forest in which 90 wildlife species live in. There are 9 – 32 species (3 – 15 protected) in mangrove forest, 36 species (14 protected) in beach forest, and 30 species (16 protected) in lowland forest.In all forest type,

dominant wildlife groupisbirds.Furthermore various observation location on the Sebuku Island have separate community characteristic and different with each other.

References

[1]   Tagliapetra, Sigovini 2010 Benthic fauna: collection and identification of macro benthic invertebrates *Terre et Environment* **88** p 253-261

[2]   Tews et al. 2004 Animal species diversity driven by habitat heterogeneity/diversity: The importance of keystone structures *Journal of Biogeography* **31** p 79–92

[3]   Johnson M D 2007 Measuring habitat quality: a review *Condor* **109** p 489–504

[4]   Mitchell S C 2005 How useful is the concept of habitat? *Oikos* **110** 3 p 634-638

[5]   Morris D 2003 Toward an Ecological Synthesis: A Case for Habitat Selection *Oecologia* **136** p 1-13

[6]   Hostetler M E, Drake D 2009 Conservation subdivisions: a wildlife perspective *Landscape and Urban Planning* **90** 3-4 p 95-101.

[7]   Morrison et al. 2006 Population estimates of North American shorebirds *Wader Study Group Bull* **111** p 67-85

[8]   Poole R W 1974 *An Introductuon To Quantitative Ecology* (New York: McGraw-Hill)

[9]   Krebs 1978 *Ecology: The Experimental Analysis of Distribution and Abundance* (New York: Harper and Row Distribution)

[10]   [WCMC] World Conservation Monitoring Centre *1992 Global Biodiversity: status of the Earth's living resources* (London: WCMC)

[11]   Horne J S, Garton EO, Rachlow J L 2008 A synoptic model of animal space use: simultaneous estimation of home range, habitat selection, and inter/intra-specific relationships. *Ecol. Modell.* **214** p 338–348

[12]   Hall L S, Krausman P R, Morrison M L 1997 The habitat concept and a plea for standard terminology *Wildlife Soc. Bull.* **25** p173–182

[13]   McKinney M L 2006 Urbanization as a major cause of biotic homogenization *Biological Conservation* **127** 3 p 247-260

[14]   Coffin A W 2007 From roadkill to road ecology: A review of the ecologicaleffects of roads *Journal of Transport Geography* **15** p 396-406