

## THE STUDY OF WILDLIFE SPECIES RICHNESS USING CAMERA TRAPS IN THE SIPURAK HOOK AREA KERINCI SEBLAT NATIONAL PARK

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**Abstrak.** Indonesia is known as one of the countries that has the highest biodiversity in the world, thus making Indonesia have an important role in animal trade and become one of the largest suppliers of animal trade in the world. The impact of changes in forest function has caused the loss and fragmentation of habitat for various species of wildlife on the island of Sumatra, especially in the Kerinci Seblat National Park. Sipurak Hook is a production forest area that has changed its function into the Kerinci Seblat National Park Area on the basis of the decision of the minister of forestry number: 420/menhut-II 2004, dated 29 October 2004. Sipurak Hook is located in Merangin district, Jambi Province with an area of ± 14,160 Ha and is a habitat for important animals, the Sipurak Hook area is included in the core zone of the Kerinci Seblat National Park. This research was conducted over a span of ± 2 months, in the Sipurak area, Merangin district, Jambi province. The trap camera is installed on a tree trunk with an average height of 30-45 cm above the ground. The camera position is facing the lane at a distance of 2.5 meters from the edge of the lane and calculates the direction of light coming from it. The camera trap installation location takes into account the high probability of detection such as animal activity centers, crossroads, sources of food and drink and traces found. The analysis used is Independent Event, Relative Abundance Index and Daily Activity of Animals. The results of this study found 20 species of wild animals from 13 families, with a total of 201 independent event (IE) photos with the highest relative abundance of animals (Squirrel javanica) of 12.95% and the lowest animal Sumatran tiger (Panthera tigris sumatrae) of 0.72%. Based on the conservation status, 20 species are protected according to the IUCN Red list, 7 species are protected according to CITES trade status and 11 species are protected according to the Minister of Environment and Forestry Regulation No.20 of 2018. Most of the daily activities of wild animals are active at night (nocturnal), namely 65% and wild animals that are active during the day (diurnal) 35%.

**Keywords:** camera traps; national park; species richness; wildlife

### I. INTRODUCTION

Indonesia is known as one of the countries that has the highest biodiversity in the world, thus making Indonesia have an important role in animal trade and become one of the largest suppliers of animal trade in the world. These animals are scattered throughout the islands in Indonesia. The important role of wild animals in the ecosystem is to maintain the stability of the ecosystem. Apart from being a large predator, its other role is as an umbrella species considering the need for large areas to meet needs including food, protection and space. Kerinci Seblat National Park (*Taman Nasional Kerinci Seblat - TNKS*) is a conservation area established by Decree of the Minister of Forestry and Plantations No. 901/Kpts-II/1999 covering an area of ±1,375,349.867 Ha and in 2004 the Minister of Forestry stipulated a change in the function of the Sipurak Hook forest area of ± 14,160 Ha to become part of the TNKS area with a decree No.420/Menhut-II/2004, so that the area of the TNKS area became ±1,389,509.867 Ha. In addition to being a protected area for ecological processes that support life, KSNP also functions as a biodiversity conservation area for

the purpose of preserving genetic resources, a vehicle for education and research, and supporting cultural development.

The survival of a population in nature is closely related to demographic, genetic and environmental factors. In addition, low birth rates, high infant mortality rates, high threat levels and low prey populations are factors that affect the density of species populations in nature. Deforestation rates and high levels of poaching threats have led to a decline in wildlife populations. As a result, these low population animals are categorized as "critically endangered species" or critical endangered species which is the highest category of threat of extinction (IUCN [1]). The number of wild animals in their natural habitat (forest) is a form of richness and diversity of biological natural resources, therefore it is necessary to protect and preserve nature. To be able to carry out protection and preservation, it is necessary to know the number and distribution of wild animals in their habitat. However, for species with elusive behavior when meeting humans and in disguise (cryptic), such as the Sumatran tiger, it is very difficult to make direct calculations (Hutajulu [2]). this has pushed certain species to the brink of extinction. In Sumatra, almost all large mammal species experience this. The population size of a species can be estimated by various

research methods including direct calculation methods, trace calculation methods, estimation methods, calculations with sample plots and camera trap methods (Hutajulu [2])

The recommended and reliable method for calculating wildlife populations in nature is to use camera traps. Because it is less effective if done by direct observation, the application of camera traps to monitor the presence of large carnivores. The Sumatran tiger (*Panthera tigris sumatrae*) and the Sumatran elephant (*Elephas maximus sumatranus*) are two examples of animal species that are currently under threat. In this case, this animal is deliberately hunted for its body parts. In addition, the increasing human activity in the forest is increasingly pushing these animals into population pockets that are increasingly difficult to reach (WWF [3]). To study the ecological characteristics and monitor large mammals or wildlife with elusive behavior, a camera trap is used. Camera traps can provide accurate data including species presence, distribution, animal activity, home range and so on (Griffiths & Schaick [4]; Maddox et al. [5]). Camera traps have long been used for monitoring wildlife in certain areas and in wildlife conservation efforts because this technology is quite easy to use and does not require sufficient manpower. Because many species of animals are difficult to reach, are active at night and avoid encounters with humans. The installation of camera traps is usually done in places that are often passed or used as a place to stop temporarily by an animal (Maddox et al. [5]). However, it is also adjusted to the surrounding conditions so as not to interfere with the activities carried out by the animals themselves. The use of camera traps also needs to be considered so that there are no obstacles when data collection is carried out (Mustari & Setiawan [6]).

Wildlife observations using camera traps have been widely carried out and are very efficient in observing the presence of wild animals which usually avoid direct encounters with humans (Anjelia [7]). Camera traps produce data in the form of images or videos that can be used to determine species diversity, the relative abundance of animals in forest areas. The advantage of using camera traps is that observations can be carried out continuously every day and are more efficient than direct observations (Azlan [8]). Sipurak Hook is a production forest area that has changed its function to become a TNKS area on the basis of the decision of the minister of forestry number: 420/menhut-II 2004, dated October 29, 2004. Sipurak Hook is located in Merangin district, Jambi Province with an area of  $\pm 14,160$  Ha and is a habitat for wild animals such as the Sumatran tiger (*Panthera tigris sumatrae*), Tapir (*Tapirus indicus*), Sumatran serow (*Capricornis sumatraensis*), Sambar deer (*Cervus unicolor*), Barking deer (*Muntiacus muntjak*) and others. The Sipurak Hook area is included in the TNKS core zone which is given the title of TNKS heaven (TNKS [9]).

Data on species richness, abundance, conservation status, and daily activities of important animals need to be collected for conservation purposes. The research is expected to be able to complete the data and provide information on the richness of wildlife species in the Sipurak Hook Region 1 area of the Kerinci Seblat National Park. And this data is expected

to be a consideration for policy making by the authorities in efforts to conserve wild animals.

## II. RESEARCH METHODS

This research was carried out over a period of  $\pm 2$  months, starting from November 2020 to January 2021. This research was carried out which is located in the Sipurak Hook Area National Park Management Section Region 1 Kerinci Seblat National Park. Administratively, this area belongs to the village of Masgo, Gunung Raya District, Kerinci Regency, Jambi Province. The location for installing the camera traps was determined based on the results of a previous survey from the TNKS TPCU team. To make it easier to place camera traps in the field, location determination is based on optimum probability to get photos of wild animals, such as locations where animals carry out activities, places that are often used and visited by wild animals, such as water sources, saltwater sources (saltlick) and food sources (Karanth [10]; Huda et al. [11]). The choice of location was based on the existing path, namely the ridge of a hill, an open area that gets sunlight. Single camera type trap camera The type of camera used by Bushnell is the Trophy Cam HD type. There are 4 camera traps installed.

Independent photo (IE) can be said (value 1) if it fulfills the following conditions: 1). Consecutive/sequel photographs of different individuals or different species in one film number. 2). Consecutive/sequel photos of the same individual (same species) in one film number with a span of more than 1 hour or consecutive/sequel photos of different individuals if they can be clearly distinguished. 3). Individual photos of the same or of the same species that are not consecutive/sequel to one film number. (O'Brien [12]). The relative abundance index provides estimates of abundance based on the number of photos and efforts so that comparisons between different areas and studies can be seen. The number of species independent photos in each hour is displayed in graphical form to see in what period the species were most active. Activity time is divided into 2 periods, namely noon from 07:00 to 17:59 and night from 18:00 to 06:59 according to (Hutajulu [2])

## III. RESULTS AND DISCUSSION

### *Species of richness*

The species richness value is a value that indicates the number of wildlife species in the observation area. Camera traps are installed for 142 days with an average installation time of 48 days per predetermined location. The number of Trap nights from the results of installing trap cameras is 139 with an average of 46 Trap nights per camera. The total species of wild animals during the camera trap installation were found, namely 20 species of wild animals. The species were grouped into two classes, namely the mammal class and the aves class. Of the 13 families that could be identified from the camera trap analysis, namely the Phasianide family (4

species) belonging to the Aves class or birds with backbones (vertebrates) that have feathers and wings. The families Viverridae (3 species), Felidae and Cervidae (2 species), Sciuridae, Suidae, Tapiridae, Tragulidae, Ursidae, Bovidae, Cercopithecidae, Sciuridae and Suidae (1 species) belong to the class Mammalia of vertebrate animals which are primarily characterized by the presence of mammary glands.

Based on the Independent Event (IE) table, it shows that the highest animal is the Treesrew (*Tupaia javanica*) followed by the Pig-tailed macaque (*Macaca nemestrina*), Argus pheasant (*Argusianus argus*) and Forest rat (*Apodemus sylvaticus*). Pig-tailed macaque are the species caught in traps at all camera trap locations. Wildlife with the lowest percentage of Independent Event (IE), namely, Sumatran tiger (*Panthera tigris sumatrae*), Bearded pig (*Sus barbatus*) and Sumatran serow (*Capricornis sumatraensis*). Junaidi [13] conducted research using camera traps in the Biology Education and Research Forest Area, Andalas University. From the 207 independent photos obtained, 10 families and 10 species of mammals were identified. There were 117 independent photos of Pig-tailed macaque (*Macaca nemestrina*). Amalia, R [14] the relative abundance index carried out in the installation of camera traps in the Bukit Barisan Selatan National Park resulted in Marble cats (*pardofelis marmorata*) and Forest cats (*Prionailurus bengalensis*) being equal at 0.14%. Based on the results of this study, the Sipurak Hook area is able to accommodate various species of animals in it, both in terms of the condition of the forest and the availability of food for the animals themselves. Differences in the results of installing camera traps in TWA Seblat Bengkulu Province, Biology Education and Research Forest. Andalas University, Senamat Ulu Village Forest, Bungo Regency, Jambi Province and Bukit Barisan Selatan National Park greatly affect the number of species and abundance of animals in an area. And the difference in the number of species is caused by the large number of camera traps and the location of the placement of the camera traps. In addition, the difference in results can also be influenced by the length of time the camera traps have been set up, and the damage to the camera traps when taking pictures which results in differences in the number of species of animals obtained.

#### Relative Abundance (RAI)

Wildlife can be identified individually using a capture-craft approach. It is possible to estimate the abundance and density of animals. In this study, the animals could not be distinguished individually and using the detection rate and relative abundance index approaches, they could be used as basic data for comparison in future studies. A species with the highest species abundance value indicates that the species has a wide distribution value in a forest area and vice versa if the abundance value is low then the distribution in a forest area is also low. According to the research results, the most common wild animal found in Sipurak Hook TNKS is the Treesrew (*Tupaia javanica*) with a relative abundance index value of 12.95%, followed by the Pig-tailed macaque (*Macaca nemestrina*) 11.51%, Argus pheasant (*Argusianus argus*) 10.79 %, and Forest rat (*Apodemus sylvaticus*) 10.07%. While

the wild animals with the lowest relative abundance were the Sumatran tiger (*Panthera tigris sumatrae*) and the Sumatran serow (*Capricornis sumatraensis*) which was 0.7%.

The high percentage of squirrel relative abundance indicates that this species dominates the Sipurak Hook area. The abundance of a species of wild animal can be influenced by various factors, including the availability of abundant food, the low number of predators, and the suitability of habitat conditions. The low level of abundance of a species of mammal can feed that does not support, high predators and unsuitable conditions. These results indicate that the higher the RAI of a species, the greater the encounter rate of that species in a location and the more abundant the population of that species.

#### Wildlife Based on Conservation Status

From this conservation status, Least Concern wild animal species need continuous supervision and monitoring, it is feared that hunted animals are increasingly roaming around and animals are becoming extinct. According to Gunadi [15] the conservation status of each of these wild animals is enough to explain that these animals need more supervision to maintain the survival of the animals. Continuous hunting and narrowing of habitat are the main factors that threaten animal life.

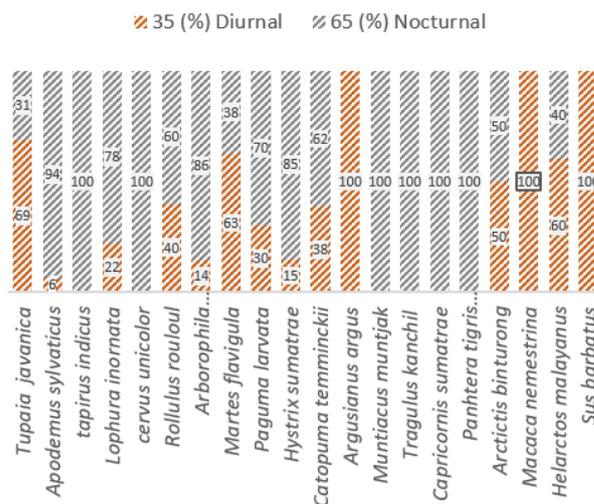


Figure 2. Daily activities of animals

The pattern of daily activity of wild animals in Sipurak Hook TNKS is classified as active at night (nocturnal) as much as 65% and animals active during the day (diurnal) 35%. There are 3 species of wild animals, namely, Bearded pig (*Sus barbatus*), Pig-tailed macaque (*Macaca nemestrina*) and Argus pheasant (*Argusianus argus*) which are (100%) active during the day (diurnal). Six species of wildlife namely, Sumatran tiger (*Panthera tigris sumatrae*), Mouse deer (*Tragulus kanchil*), Tapir (*Tapirus indicus*), Sumatran serow (*Capricornis sumatraensis*), Sambar deer (*Cervus unicolor*) and Porcupine (*hystrix sumatrae*) are included in (100 %) active all night (nocturnal). While 11 species of animals Daily activity is a combination of day and

night. For example, Treesrew (*Tupaia javanica*) are active during the day (69%) and at night (31%), Forest rat (*Apodemus sylvaticus*) are active during the day (6%) and at night (94%).

#### IV. CONCLUSION

Based on the results of research and observations that have been carried out in the Sipurak Hook area of Kerinci Seblat National Park using camera traps installed at 4 stations to obtain 201 independent event (IE) photos. Furthermore, the highest relative abundance (RAI) of animals is *Tupaia javanica* by 12.95% and the lowest animal was the *Panthera tigris sumatrae* of 0.72%. Based on the conservation status of 20 protected species according to the IUCN Red list, 1 species with Critically Endangered status, namely Sumatran tiger (*Panthera tigris sumatrae*), 1 species with Endangered status, namely Sumatran serow (*Capricornis sumatrensis*), 6 species with Vulnerable status, namely Tapir (*Tapirus indicus*), Sambar deer (*Cervus unicolor*), Beard pig (*Sus barbatus*), Sun bear (*Helarctos malayanus*), Binturong (*Arctictis binturong*) and Pig-tailed macaque (*Macaca nemestrina*), 7 species are protected according to CITES trade status and 11 species are protected according to LHK ministerial regulation No. 20 of 2018. Most of the daily activities of wild animals are nocturnal (nocturnal) which is 65% and 35% of wild animals are active during the day (diurnal). Recorded 6 species (nocturnal), 3 species (diurnal) and 11 combined active species from day and night.

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