

# Distribution of Proboscis Monkeys (*Nasalis Larvatus Wurmb, 1787*) in Forest Fragmentation Area, Tunan River, Waru District, East Kalimantan, Indonesia

Lariman\*, Abinda Muchlas Barru, Dijan Sunar Rukmi

*Biology Department, Faculty of Mathematics and Natural Sciences, Mulawarman University  
Jl. Barong Tongkok No.4 Kampus Gunung Kelua Samarinda, East Kalimantan*

**Abstract:** The proboscis monkey (*Nasalis larvatus Wurmb, 1787*) is an endemic primate of the island of Borneo that is protected and threatened with extinction. Deforestation is the biggest threat to proboscis monkeys because it destroys the ideal habitat for proboscis monkeys. The proboscis monkey's habitat includes various types of forest such as wetland forest, peat forest, heath forest, rubber forest, and mangrove forest associated with water. The Tunan River is one of the proboscis monkey's habitats outside the conservation area in the form of a forest that is fragmented apart by roads, residential areas, plantations, and ponds. Meanwhile, the spread of proboscis monkeys in the Tunan river forest fragmentation area, Waru District, North Penajam Paser Regency, East Kalimantan has never been reported so that a study is needed to determine its distribution. This research was started from January to February 2022. The data was collected using the boat survey method, namely observation by using a boat. The results obtained were twenty-four proboscis monkey distribution points based on direct observation. The distribution pattern of proboscis monkeys tends to be random in the fragmentation area and is found more in the upstream than downstream areas due to habitat conditions and the presence of forage trees that support the proboscis monkey population. Therefore, to preserve the proboscis monkey, it is necessary to provide information to the surrounding community by protecting the proboscis monkey habitat.

**Key words:** Proboscis monkeys, population, distribution, forest fragmentation.

## I. INTRODUCTION

Proboscis monkeys are arboreal primates endemic to the island of Borneo which are protected both nationally and internationally. Proboscis monkey protection in Indonesia is regulated by Government Regulation no. 7 of 1999 concerning the preservation of plants and animals. International protection has been established through the IUCN Redlist which classifies the proboscis monkey as an endangered species (EN), while CITES includes the proboscis monkey in Appendix 1 which means it has been prohibited from being traded and is an endangered species (Atmoko et al., 2011).

The spread of proboscis monkeys covers 3 countries including Indonesia, Malaysia (part of the area in Kalimantan), and Brunei Darussalam. The proboscis monkey's habitat varies greatly with various forest types such as wetland forest, peat

forest, rubber forest, heath forest and mangrove forest (Matsuda et al, 2010). Although the proboscis monkey habitat varies, in all the habitats inhabited by proboscis monkeys, it is characterized by always being associated with water, both from springs, rivers, and lakes. The presence of water for proboscis monkeys is an important aspect because proboscis monkeys have a morphology in the form of webbed feet that are not found in other primates. The presence of a water source is the starting point for proboscis monkeys from waking up to ending their activities on sleeping trees. Proboscis monkeys often spend time swimming and sometimes come down from trees to drink. Trees that are close to the water make the proboscis monkeys favorite habitat and temperature, so many are chosen as sleeping trees in the afternoon. The riverbank is a fertile area so that there are many large, dense trees with a continuous canopy, so many are chosen as the proboscis monkey's favorite sleeping tree (Bismark, 2009).

The remaining forest fragmentation area around the Tunan River, Waru District, North Penajam Paser Regency, East Kalimantan is one of the last proboscis monkey habitats in Penajam. Habitat conditions are increasingly concerning with the continued opening of the remaining fragment areas. The fragment area forms a forest block area which is mostly separated by plantations, settlements, residents, and roads. Sometimes a proboscis monkey is found crossing the road and getting hit by a passing vehicle. The public's concern for proboscis monkeys began to appear with the posting of several posters calling for speed reduction on roads that were prone to be crossed by proboscis monkeys. This study aims to determine the distribution of proboscis monkeys in the forest fragmentation area, Sungai Tunan, Waru District, North Penajam Paser Regency, East Kalimantan.

## II. METHODOLOGY

### A. Time and Location

This research was conducted from January to February 2022. The research location is in the forest fragmentation area, Sungai Tunan, Waru District, North Penajam Paser Regency, East Kalimantan Province.

### B. Tools and Materials

The tools used in this research are GPS, camera, Avenza Maps application, Quantum GIS application, Arc GIS application, skinner board, and binoculars. Materials that are the object of research are proboscis monkeys and their habitats.

### C. Working Method

Observations on the spread of proboscis monkeys were carried out using the boat survey method, namely concentrated observations of the river using a ketinting boat from downstream to upstream of the Tunan river. Observations were made in the morning from 06.00 – 10.00 while in the afternoon from 15.00-18.00. When you find a group of proboscis monkeys, the coordinates of the encounter are recorded and marked through the Avenza Maps application. The recorded encounter coordinates were then processed using Quantum GIS and Arc GIS applications.

## III. RESULTS AND DISCUSSION

The results of the study found proboscis monkeys with 25 proboscis monkey distribution points found scattered from downstream to upstream areas. The distribution tends to be random in various fragmentation areas with diverse vegetation conditions. The proboscis monkey population is estimated to be more than 400 individuals.

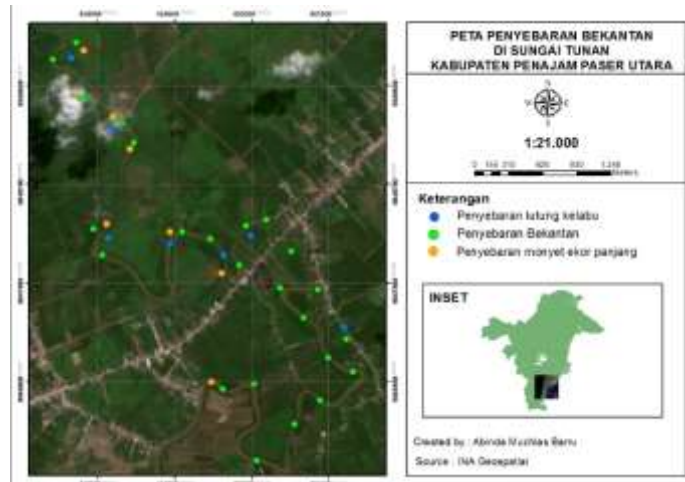


Figure 1. Map of the distribution of proboscis monkeys in the forest fragmentation area, Sungai Tunan, Waru District, North Penajam Paser Regency, East Kalimantan.

The upstream area of the river is generally occupied by more proboscis monkeys than the downstream area of the river. Some of the fragmented forest areas upstream of the river are still dense and dominated by alaban (*Vitex pinnata*), *Ficus* sp. and red pidada (*Sonneratia caseolaris*). The spread of proboscis monkeys is caused by several factors such as forage trees, the presence of sleeping trees, and weather (Bismark, 2009).

The sympatric primates found at the study site included 2 species, namely the long-tailed monkey (*Macaca fascicularis*)

and the gray langur (*Trachypithecus cristatus*). The presence of proboscis monkeys tends to be more dominant in the overall fragmentation area compared to other sympatric primates so it will be easier to find proboscis monkeys than other primates in forest fragmentation areas. This incident is similar to that reported by Iskandar et al. (2017) who found the presence of black langurs and long-tailed monkeys in proboscis monkey habitat in the Gelam swamp forest area, South Kalimantan.

Proboscis monkeys are often found together with long-tailed monkeys during the day while feeding on adjacent trees. Gray langurs are rarely found near the proboscis monkey group, usually the gray langur will use the same tree when the proboscis monkey eats but at different times. Conflicts between proboscis monkeys and long-tailed monkeys have been encountered. Long-tailed monkeys were recorded to have chased away groups of proboscis monkeys that were in their sleeping trees even though the tree was already occupied by proboscis monkeys. This incident is similar to that reported by Iskandar et al (2017) who found a herd of long-tailed monkeys that aggressively chased away proboscis monkeys from sleeping trees that were previously occupied by proboscis monkeys. Lutung has some of the same food preferences as proboscis monkeys because it is a folivorous primate that has a digestive system similar to that of ruminants.

The opening of the proboscis monkey habitat causes various threats to the proboscis monkey, some of the potential threats found during the research are habitat fragmentation, garbage accumulation, potential predators, potential pests, and potential waste.

Habitat fragmentation is very influential on proboscis monkeys because the destruction of habitat and trees that are far apart finally forces proboscis monkeys as arboreal primates to walk on the forest floor. The habit of walking on the forest floor will increase the potential for parasite transmission. The existence of forest fragmentation that has been damaged will increase the potential for inbreeding to occur. Inbreeding behavior will reduce the level of immunity and increase the potential for negative recessive genes to become dominant (Atmoko, 2012).

Garbage accumulation also occurs sporadically in rivers and some areas of forest fragmentation. Garbage that accumulates varies from organic waste, plastic, animal carcasses, and household waste. Proboscis monkeys have been recorded foraging for food in piles of garbage. According to Rengku et al. (2020) Garbage and wildlife are something that must be separated because it will result in changes in behavior and pollute the habitat.

Some of the damaged proboscis monkeys' habitats have been converted into oil palm plantations. The existence of oil palm plantations will certainly reduce the space for movement and the proboscis monkey's favorite food tree, namely red pidada. Proboscis monkeys have been observed eating palm fruit in a

ripe condition. This behavior is included in the categorization of crop raiding. According to Sayektiningsih (2020) crop raiding behavior is the destruction of cultivated plants by stepping on, eating or destroying which causes economic losses. Proboscis monkeys who eat mature palms will certainly be detrimental to the community because it will damage crop yields both qualitatively and quantitatively. This behavior can make proboscis monkeys as pests and have the potential to be hunted by the community.

Predators do have potential as predators for proboscis monkeys, some of the predators observed were estuarine crocodiles (*Crocodylus porosus*), pythons (*Malayopython reticulatus*), and monitor lizards (*Varanus salvator*). According to Bismark (2009), proboscis monkeys have some of the predators are the forest tiger (*Neofelis nebulosa*), king cobra snake (*Ophiopagus hannah*), python (*Malayopython reticulatus*), and monitor lizard (*Varanus salvator*).

#### IV. CONCLUSIONS

##### A. Conclusion

The distribution of proboscis monkeys was found as many as 25 encounter points with more distribution in the upstream area compared to the downstream of the river because the upstream area had vegetation conditions that further supported the existence of the proboscis monkey population. Proboscis monkeys were found to dominate the entire fragmentation area compared to long-tailed monkeys and gray langurs. Threats to the presence of proboscis monkeys include habitat fragmentation, garbage accumulation, potential pests, and potential predators.

##### B. Suggestion

It is necessary to educate the public about the existence of proboscis monkeys as protected wild animals so that people do not hunt proboscis monkeys because they are considered detrimental to agriculture. In the long term, it is necessary to plant forage trees to increase proboscis monkey feed preferences and rehabilitate fragmented forest areas.

#### REFERENCE

- [1] Atmoko, T., A. S.E. Rinaldi & B.S. Sitepu. 2011. Distribution of proboscis monkey (*Nasalis larvatus* Wurm.) in an unprotected area in Balikpapan Bay, East Kalimantan. In: Proceedings of Exposing Research Results to Support Beneficial Conservation and Conservative Use. Research and Development Center for Conservation and Rehabilitation. Research and Development Agency of the Ministry of Forestry.
- [2] Atmoko, Tri & Kade Sidiyasa. 2008. Karakteristik Vegetasi Habitat Bekantan (*Nasalis larvatus* Wurm.) di Delta Mahakam, Kalimantan Timur. *Jurnal Penelitian Hutan dan Konservasi Alam*. 5 (4) : 307 – 316.
- [3] Atmoko, T. 2012. Kuala Samboja Proboscis Monkeys Survive Within Limitations. Balikpapan: Research and technology center for natural resource conservation.
- [4] Bismark, M. 2009. Conservation Biology of Proboscis Monkey (*Nasalis larvatus*). Center for Forest Research and Development and Nature Conservation, Research and Development Agency Ministry of Forestry.

- [5] Iskandar, S., H.S. Alikodra., M. Bismark., & A. P. Kartono. 2017. Population Status and Conservation of Proboscis Monkey (*Nasalis larvatus* Wurm., 1787) in the Rawa Gelam Habitat, South Kalimantan. *Journal of Forest Research and Nature Conservation*. 14(2) : 123 -132.
- [6] Matsuda I, Tuuga A, Higashi S. 2010. Effect of Water Level on Sleeping-site Selection and Intergroup Association in Proboscis Monkeys: Why do They Sleep Alone Inland on Flooded Days. *Ecological Research*. 25:475-482.
- [7] Rengku, M. T., Teguh, Agung S., & Mukhlisi. 2020. Swara Samboja Magazine: Mitigation of Potential Conflicts between Monkeys (*Macaca fascicularis* & *Macaca nemestrina*) with Humans around KHDTK Samboja. *Samboja : Balitek KSDA Samboja*.
- [8] Sayektiningsih, T. 2020. Swara Samboja Magazine: Crop Raiding by Wild Animals. *Samboja : Balitek KSDA Samboja*.
- [9] Soendjoto, M.A., H.S. Alikodra, M. Bismark & H. Setijanto. 2006. Jenis dan komposisi pakan bekantan (*Nasalis larvatus* Wurm.) di Hutan Karet Kabupaten Tabalong, Kalimantan Selatan. *Biodiversitas* 7(1) : 34-38.