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ESTIMATE POPULATION OF LONG-TAILED MACAQUE *Macaca fascicularis* (PRIMATES: CERCOPITHECIDAE) IN CALIK RIVER, SOUTH SUMATRA

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Abstrak

Monyet-ekor Panjang *Macaca fascicularis* baru-baru ini dianggap sebagai primata Terancam (Endangered) berdasarkan asumsi bahwa terjadi penurunan yang cepat karena tingginya permintaan dalam perdagangan. Untuk melihat data terkini dari primata ini, kami melakukan survei mega transek pada tanggal 5 Juni 2022 dan 10-15 Juni 2022, untuk melihat populasi *M. fascicularis* di sepanjang 115 km di tepi Sungai Calik, Provinsi Sumatera Selatan, Indonesia. Survei ini dilakukan dengan cari observasi langsung untuk mendata semua individu *M. fascicularis*. Hasil survei mencatat total 1.194 individu *M. fascicularis* ditemukan di Sungai Calik. Berdasarkan cakupan wilayah survei diperkirakan populasi *M. fascicularis* di daerah ini bisa mencapai 2.000 individu. Karena jumlah populasinya yang tinggi, primata ini menjadi hama bagi tanaman utama masyarakat setempat. Berdasarkan hasil wawancara, tidak ada indikasi perburuan atau dijumpai adanya masyarakat lokal yang memelihara *M. fascicularis* sebagai hewan peliharaan. Survei kami menunjukkan bahwa *M. fascicularis* adalah spesies yang paling umum di habitat sungai di Sungai Carik.

Kata kunci: Terancam, Monyet-ekor panjang, *Macaca fascicularis*, populasi, Sumatera.

Abstract

Long-tailed Macaque Macaca fascicularis is recently considered Endangered primate based on the assumption of rapid decline due to the heavy demand in trading. To look at recent data of this Endangered primate, we conduct a mega transect survey on 5 June 2022 and 10-15 June 2022, to assess the populatons on M. fascicularis along 115 km of Calik River, South Sumatra Province, Indonesia. We use direct observation to census all individuals of M. fascicularis. Our survey found a total of 1.194 individuals of M. fascicularis were encountered in Calik River. Based on the survey coverage, it is presumed that the population of M. fascicularis in this area could reach 2.000 individuals. Due to the high population, it was confirmed that this primate has become a pest for the major crops of local people. In addition, no indication of hunting or observation of local people who keep M. fascicularis as a pet. Our survey suggests M. fascicularis is the most common species in riverine habitats.

Keywords: *Endangered, Long-tailed Macaque, Macaca fascicularis, population, Sumatra.*

INTRODUCTION

The Old World Monkeys (Family Cercopithecidae) are the most adapted primates to almost all habitat types in their range with a large elevational zone from sea level to about 4.000 m, and some species live close to urban habitats (Zinner *et al.* 2013). The Long-tailed Macaque *Macaca fascicularis* is one adaptive species of Old World Monkeys native to South Asia and Southeast Asia that found from sea level to 2.000 m (MacKinnon & MacKinnon 1980; Rowe 1996; Shepherd & Shepherd 2017). Throughout their range, this primate inhabits coastal and riverine, mangrove and nipa swamp, lowland forest, hill forest and mountain forest; as well as primary forest and disturbed habitat (Fooden 1995; Sussman *et al.* 2011).

Macaca fascicularis is recently considered as Endangered because it is presumed that the population has undergone a decline of *c.* 40% in the last three generations (around 42 years), and that the rate of population decrease will rise to at least 50% in three generations in the future (Hansen *et al.* 2022). The population of *M. fascicularis* in Southeast Asia reported a rapid decline due to its high demand in trading (Eudey 2008). However, in contrast, Francis (2008) reported that the status of *M. fascicularis* in Southeast Asia is common in coastal forest and urban habitats, sometimes as pets in commercial crops, and not considered at risk.

Sumatra is the second largest island (473,481 km2) in Indonesia and home to three subspecies of *M. fascicularis*, including *M. f. fascicularis* (mainland Sumatra, Bangka and Belitung), *M. f. fuscus* (endemic Simeulue Island, Aceh) and *M. f. lasiae* (endemic Lasia Island, Aceh) (Whitten *et al.* 2000; Supriatna 2019; Beausejour *et al.* 2021). In three provinces of Southern Sumatra, it was estimated that *M. fascicularis* population is more than 1.250.000 individuals in Jambi Province, 400.000 individuals in Bengkulu Province and 275.000 individuals in Lampung Province (Supriatna *et al.* 1996). In South Sumatra Province, standardized surveys along the Kepahiang River of Musi Banyuasin suggest that *M. fascicularis* is the most encountered species (79%) from five species of primates (Danielsen & Verheugt 1990). In this paper, we report our mega transect survey in Calik River as a sample location to look at the recent population of *M. fascicularis* in South Sumatra Province, Indonesia.

METHODS

A mega transect survey of up to 115 km transect line was carried out on 5 June 2022 and 10-15 June 2022 from Calik River, South Sumatra Province (Figure 1). The Calik River is a large river in South Sumatra Province. The survey site covers the downstream area (Mukut Village, Pulau Rimau Subdistrict, Banyuasin District; 02°32'S, 104°25'E) and to upper stream area (Peninggalan Village, Tungkal Jaya Subdistrict, Musi Banyuasin District; 02°22'S, 103°56'E).

The middle of the Calik River to the upstream area is the first transect (transect line 1, *c.* 67 km); and the middle of Calik River to the downstream area is the second transect (transect line 2, *c.* 48 km). The River is dominated by mangrove and Nypa habitats, particularly in the downstream areas (Wijayanto *et al.* 2014; Yuliana *et al.* 2019). The Calik River with its connected wetlands is known as an important fishery area in Banyuasin District, South Sumatra Province (Indriani *et al.* 2009).

As the survey site is riverine forest habitats and other connected wetlands, the survey was conducted using a speedboat 40 HP (Horse Power) engine. All individuals of *M. fascicularis* found along the river were counted and noted. The survey was carried out with three survey repetitions. The best maximum number of individuals of *M. fascicularis* was taken and put on the map (Fig. 2 and 3). Due to the long distance of the transect line, the team was divided into two groups. One group a surveyed in the downstream area, and another group in the upstream area. On the next day, the team who surveyed in the dowstream area will visit the upper stream area, and vice versa. The using boat was applied in wildlife survey (Greenwood & Robinson 2006; Yustian *et al.* 2017). Studies of primates with boats have been conducted in Borneo (Goossens *et al.* 2003; Matsuda 2022). In the wetlands of South Sumatra, wildlife surveys using speedboats were applied in certain regions, eg. Banyuasin Peninsula (Iqbal 2004a, b).

To complete this survey, we conduct interviews with local people to explore their knowledge about the status and number of populations of *M. fascicularis* in Calik River and adjacent areas.

RESULTS

A total of 1.194 individuals of *M. fascicularis* was counted in June 2022 along the 115 km of riverine habitats in Calik River, South Sumatra Province (Table 1).

The total number of 1.194 individuals of *M. fascicularis* was derived from 621 individuals of *M. fascicularis* in the upstream area (transect line 1), and 573 individuals of *M. fascicularis* in the downstream area (transect line 2). The distribution and number of *M. fascicularis* in transect lines 1 and 2 are presented in Figures 2 and 3.

Table 1. Transect lines and maximum count of Long-tailed Macaque *Macaca fascicularis* in June 2022, Calik River, South Sumatra Province.

Location	Line Distance	Maximum Count of *M. fascicularis*	Remarks
Transect Line 1	67 km	621	Upstream
Transect Line 2	48 km	573	Downstream
Total	115 km	1194	

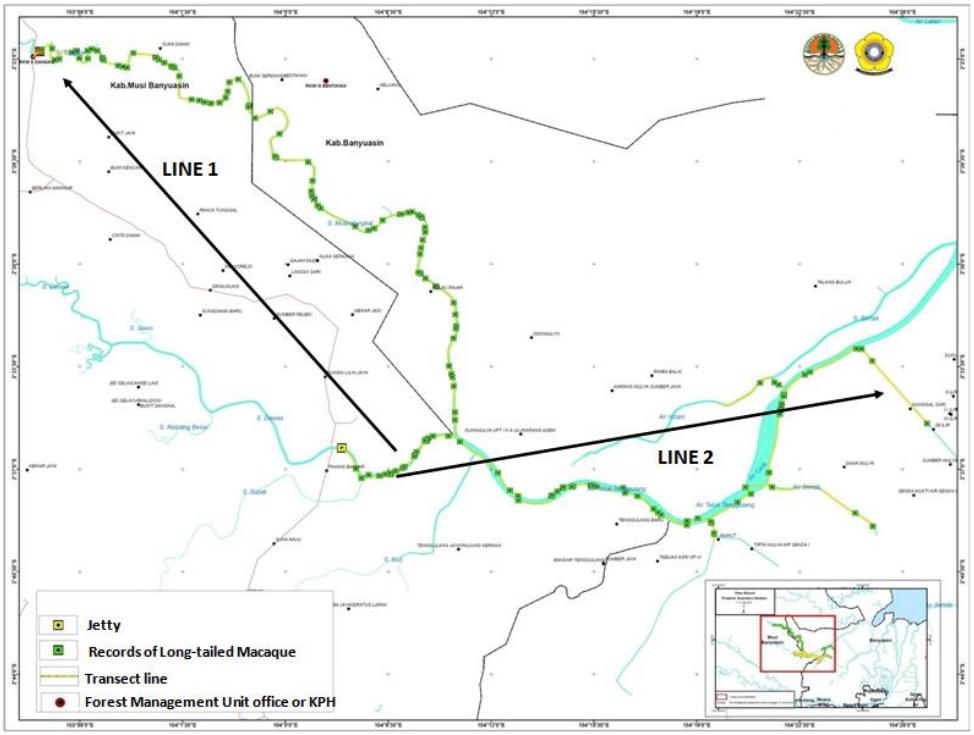

Figure 1. Location of mega transect survey to assess the population of the Long-tailed Macaque *Macaca fascicularis* in June 2022, Calik River, South Sumatra Province. The black arrows show the transect lines and survey directions.

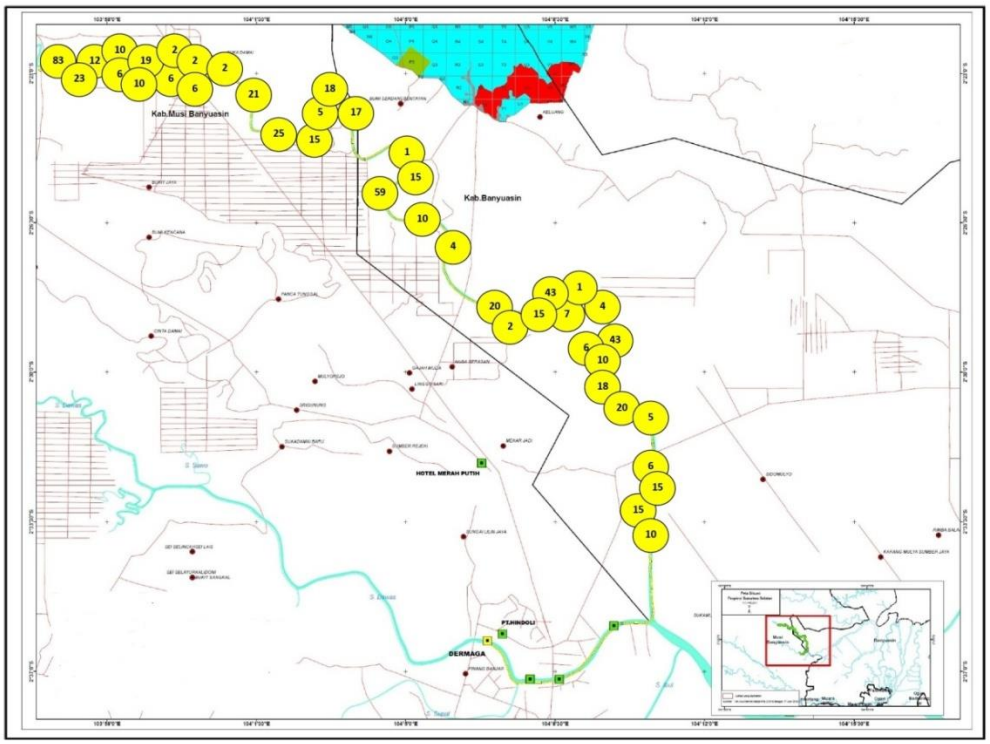

Figure 2. Distribution and number of the Long-tailed Macaque *Macaca fascicularis* in transect 1, Calik River, South Sumatra Province. The yellow circle is the location where *M. fascicularis* recorded, and number in the circle show number of the individual found.

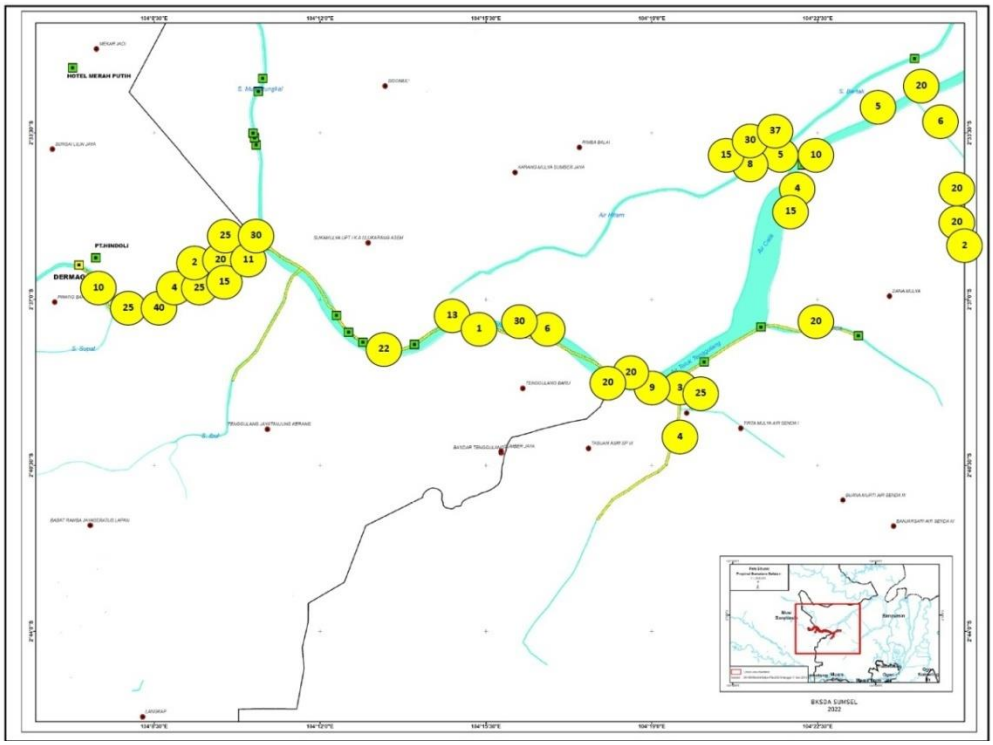

Figure 3. Distribution and number of the Long-tailed Macaque *Macaca fascicularis* in transect 2, Calik River, South Sumatra Province. The yellow circle is the location where *M. fascicularis* recorded, and the number in circle show the number of the individual found.

DISCUSSION

There are 40 observation spots for *M. fascicularis* in transect 1, and 35 observation spots in transect 2. Based on the survey coverage and number of spots, it is estimated that the population of *M. fascicularis* in Calik River could reach 2.000 individuals. This number is nearly similar to the national population of *M. fascicularis* in Singapore country. Sha *et al.* (2009) reported the population of *M. fascicularis* in Singapore consists of *c*. 1.218–1.454 individuals, and Riley *et al.* (2015) estimated the *M. fascicularis* population in Singapore range from 1.810–2.166 individuals based on the census of 2012. In Peninsular Malaysia, the population of *M. fascicularis* was estimated at 133.403 individuals based on the census in 2011 (Karuppannan *et al.* 2014). Until now, there is no data available for *M. fascicularis* in Indonesia, but this species has been overpopulated and many populations are hunted and killed by the local community (Kuswanda *et al.* 2023).

The highest number of a group of *M. fascicularis* was 83 individuals. This number is found in the northernmost of upstream area (transect 1). In the downstream area, the highest number of a group is 40 individuals. On some occasions, we found a single individual of *M. fascicularis* in both transects. The *M. fascicularis* are highly social primates, forming groups of single or some males as well as many females with their young (Van Noordwijk *et al.* 1993; Karimullah 2011). The group sizes of *M. fascicularis* are varies depending on the availability of food; whereas in mangrove forests it ranges from 10-20 individuals, in the primary can reach 20-30 individuals, in disturbed habitats can reach 40 individuals, and nearly 50 individuals found at an elevation of 1.500 m above sea level (Supriatna & Wahyono 2000; Fauzi *et al.* 2020). Ziner *et al.* (2013) reported that non-provisioned groups of *M. fascicularis* consist of 5-100 individuals, although they may subdivided into smaller units to forage.

Hansen *et al.* (2022) has been uplisted global status of *M. fascicularis* based on the assumption of rapid decline of this primate in some regions in South and Southeast Asia. In contrast with Hansen *et al.* (2022), our survey suggests that *M. fascicularis* is a common mammal in riverine habitats of the Calik River. This survey was supported by information from local people that interviewed during this survey. Most the local people reported that *M. fascicularis* is common in their surrounding habitats, give disturbance (eg. entering the home and stealing the food) and becomes a pest for their crops. Sulistyadi *et al.* (2023) reported that

the population of *M. fascicularis* in the wild is relatively stable as they live in multi-gender groups and are adaptive and able to reproduce throughout the year.

The *M. fascicularis* is widely distributed in Sumatra, from Aceh (in north Sumatra) to Lampung (in south Sumatra). There are some recent studies of *M. fascicularis* in Sumatra, including a total of 2.864 individuals based on the survey in 2012 in Seunapet, Aceh (Hedriansyah *et al.* 2015); a total of 45 individuals based on the survey in 2015 in Sibolangit Wildlife Reserve, North Sumatra (Sembiring *et al.* 2016); a total of 93 individuals based on the survey in 2018 in Jambi University, Jambi Province (Alawiyah 2019); a total of 343 individuals based on the survey in 2019 in Ngarai Sianok, West Sumatra Province (Nelfitriza 2020), a total of 200 individuals based on the survey in 2011 in Punti Kayu Recreation Forest, South Sumatra Province (Hafsari *et al.* 2014); and a total of 180 individuals based on the survey in 2014 in Rajabasa Protection Forest, Lampung Province (Pramudya *et al.* 2015). In North Sumatra, The *M. fascicularis* is considered as pest to local people main crops (Kuswanda *et al.* 2023). The further survey is needed to determine the population size and local status of *M. fascicularis* in Indonesia, particularly in Sumatra. As explained by Gummert *et al.* (2011), the *M. fascicularis* population-level research will provide us with the information database necessary to support quality population monitoring and management programs aimed at alleviating controlling trade, human-macaque conflicts, and maintaining a sustainable *M. fascicularis* population into the future.

CONCLUSSION

A total of 1.194 individuals of *M. fascicularis* found along 115 km in Carik River in June 2022 suggest this primate is common species in riverine habitats in South Sumatra. Our recent survey in the Carik River and the occurrence of *M. fascicularis* elsewhere in Sumatra suggest that this species is common and still in good number.

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