

Distribution of Sunda Stink-badger *Mydaus javanensis* in Sarawak, Malaysia

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Abstract

The Sunda Stink-badger (Teledu) *Mydaus javanensis* is one of the least studied mammals in the island of Borneo. Standard sources imply that it occurs throughout Sarawak, but this stance is not supported by the few, and geographically restricted records here traced in a review of records from the state. Historical specimens and recent sightings, in the context of survey effort across the state, suggest that Sunda Stink-badger does not occur south of Miri Division, and may even be erratic in occurrence outside the northernmost part of the state.

Keywords: Borneo, Miri Division, legal protection, protected area

Taburan Teledu *Mydaus javanensis* di Sarawak, Malaysia

Abstrak

Teledu atau lebih dikenali dengan nama saintifiknya *Mydaus javanensis* merupakan salah satu daripada spesies haiwan karnivora kecil yang jarang dan hampir tidak pernah dikaji secara terperinci di kepulauan Borneo khususnya. Berdasarkan sumber-sumber yang lazimnya didapati sebelum ini, menegaskan bahawa haiwan ini telah dikenalpasti dan dikesan meliputi hutan negeri Sarawak, tetapi kebenaran ini tidak dapat disokong kebenarannya oleh sesetengah pihak secara kajian saintifik, disebabkan oleh kawasan taburan geografi haiwan ini yang terhad dan rekod-rekod lampau yang tidak mencukupi untuk menyokong fakta sedemikian. Berdasarkan specimen-spesimen lama ditambah lagi dengan pemerhatian dan pemantauan yang telah dan sedang dijalankan untuk baru-baru ini terutamanya meliputi kawasan negeri Sarawak telah mengesahkan bahawa haiwan ini tidak menghuni kawasan di bahagian selatan bahagian Miri sehingga ke bahagian Kuching dan berkemungkinan juga mempunyai taburan yang tidak sekata terutamanya di kawasan utara negeri Sarawak.

Kata kunci: Borneo, Miri sehingga ke bahagian Kuching, kawalan undang-undang, kawasan terkawal

Introduction

The state of Sarawak, in the northwest part of the island of Borneo, covers approximately 24,450 km² of various habitats mostly forests (Bennett & Gumal 2001). It is the largest state in Malaysia. Of the approximately 24 species of the order Carnivora on Borneo, the Sunda Stink-badger (Teledu, or Malay Badger) *Mydaus javanensis* is among the most distinctive by sight and smell.

“Many many times . . . the mydaus has discovered its proximity to us by its extremely disagreeable and peculiar odour. So powerful indeed is this that natives, attempting to catch these animals, often fall down insensible if struck by the discharge from their anal battery. Even at the distance of half a mile and more the stink, as I must call it, permeates the atmosphere so thickly that it is plainly discernible by taste” (Forbes 1879).

The species occurs only on Java, Sumatra, the North Nantunas, and some neighbouring small islands, as well as Borneo (Corbet & Hill 1992, Meijaard 2003). Its only congener is the Palawan Stink-badger *Mydaus marchei* of Palawan and associated islands in the Philippines: these two species are the only species of skunks (Mephitidae) outside the Americas (Dragoo & Hon-

eycutt 1997). Although Payne *et al.* (1985) felt that the species had a patchy distribution in Borneo, various subsequent secondary sources (e.g. Corbet & Hill 1992, Hwang & Larivière 2003, Long *et al.* 2008, Dragoo 2009) map, state or imply that Stink-badgers occur throughout Sarawak, which covers nearly 17% of the land area of Borneo. This suggestion is here tested by assembling Stink-badger records from across the state, followed by discussion of the species's habitat use and local conservation status.

Data sources

Records were sought from all available sources: the authors' notes; publications (formal and 'grey'; see Corlett 2011); in international museum holdings and their printed catalogues (e.g. Kool & Yakup Nawi 2005); and in correspondence with colleagues. Of particular relevance, many of the most intensive recent mammal surveys within the border of Sarawak were made by the Sarawak Forestry Corporation. Areas surveyed included several national parks (NPs), using camera-trap, line transect and night spotlighting surveys. None of the surveys reviewed had specifically targeted Stink-badger, but camera-trapping and spotlighting seem well able to detect the species where present (e.g. Wilting *et al.* 2010, though see Holden 2006). Most surveys aimed mainly to document in general terms the area's mammalian community.

Past and current distribution of Sunda Stink-badger in Sarawak

The first Stink-badger record from Sarawak was the collection of the two skins held by local people near Gunung (= Mount) Murud documented by Moulton (1921). Medway's (1977) comprehensive review traced few records from the state, and for the past 30 years or so, the only reliable Stink-badger records traced from Sarawak comprise incidental sightings and road-kills. All Sarawak records traced are given in Table 1 and portrayed in Fig. 1.

These records suggest that, in contrast to the portrayal in general sources (see above), Sunda Stink-badger is highly localised in Sarawak. Records come only from the Kelabit highlands and northwards to the border with Sabah. The only two records of road kills involving Stink-badgers were both from northern Sarawak (in Lawas), despite there probably being many more miles driven by people likely to notice and report road-kill wildlife in and around Kuching than in the state's north. Similarly, patterns of relevant survey effort across Sarawak warrant evaluation to consider whether the restriction of Stink-badger records in Sarawak to the north is likely to be a true reflection of the species's distribution, rather than a false impression from uneven survey effort.

Various surveys, particularly in protected areas, including Similajau NP (Duckworth 1997), Lambir Hills NP (Mohd Azlan & Lading 2006), Niah NP (Anwarali Khan *et al.* 2008)

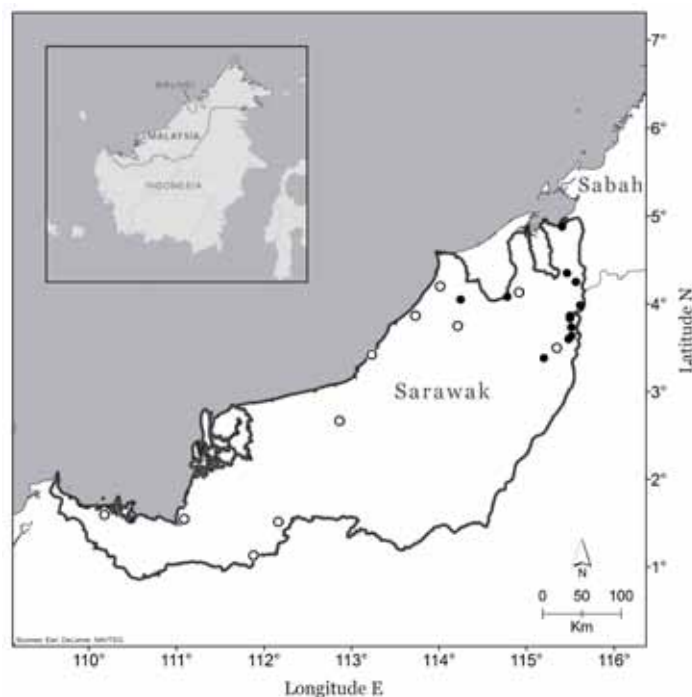


Fig. 1. Sarawak, Malaysian Borneo, showing Sunda Stink-badger *Mydaus javanensis* records (black dots) and other survey areas (open circles) mentioned in the text.

Table 1. Sunda Stink-badger *Mydaus javanensis* records from Sarawak.

Site name	Lat/long; altitude	Date; time of day	Habitat	Type of record	Observer or reference	Other notes
Kuala Lawas (Sri Tanjung resort)	4°57'22"N, 115°24'16"E; sea level	14 July 2010; 19h00	Muddy / sandy area adjacent to mangrove and peat-swamp forest	Field sighting	Oswald Braken Tisen <i>in litt.</i> 2011	Stuck between refrigerator and kitchen wall
Merarap camp to Long Semadoh Nasab (Lawas)	Roughly 4°21'N, 115°28'E; within 500–650 m	23 December 2007; n/a	Mixed hill dipterocarp forest	Roadkill	B. Gimán	On logging road
Long Semadoh Nasab (Lawas)	Roughly 4°15'N, 115°34'E; within 450–550 m	2009; within 18h00–19h00	Not known	Field sighting	Balang (local villager)	Found near their settlement
Gn. Mulu NP, park entrance area	4°05'N, 114°47'E; 15 m	5 November 2002; about 04h30	Not known	Field sighting	V. Dinets <i>in litt.</i> 2011	
Ba Kelalan (Lawas)	Roughly 3°59'N, 115°37'E; within 750–850 m	2003; n/a	Mixed hill dipterocarp forest	Roadkill	Balang (local villager)	On logging road
Gn. Murud	About 3°50'N, 115°30'E; within 1,000–2,000 m	Before 1922	Not known	Three native skins	Moulton 1921, 1922	Location based on local report
Pa Umur, Kelabit uplands	3°44'N, 115°31'E; 3,500'	Within 1945–1949	Not known	Two specimens	Davis 1958	
Pah Trap and Pa Main, Kelabit uplands	Roughly 3°38'N, 115°31'E; ?1,000 m	About 1924	"Open forest country"	Ten specimens	Lönnerberg & Mjöberg 1925	Considered it common in the area
Pa Main, Kelabit uplands	3°38'N, 115°31'E; 3,300'	Within 1945–1949	Not known	Specimen	Davis 1958	

Records are listed from north to south.

and Maludam NP (Azlan 2004; J. Hon verbally 2011), all on or near the central-west coast of Sarawak; Loagan Bunut NP (Mohd Azlan *et al.* 2006) in central north-east Sarawak; Gunung Gading NP (A. McKenzie verbally 2011) in south-west Sarawak; Batang Ai NP (Meredith 1995; R. Scott verbally 2011) and part of Lanjak–Entimau Wildlife Sanctuary (E. Lading verbally 2011), both in central-southern Sarawak; and Kubah NP in southern Sarawak (Azlan *et al.* 2007; Mohd Tajuddin verbally 2011), all found no sign of Stink-badgers. Stuebing's (1995) surveys in central Sarawak's mixed dipterocarp forest, ongoing camera-trapping and spotlighting in this part of the state by Grand Perfect Conservation Department of the 4,900 km² Sarawak Planted Forest Project within Bintulu Division, comprising mixed old secondary forest and *Acacia mangium* monoculture plantations (of various ages) interspersed with natural forests (Belden *et al.* 2007a, 2007b, McShea *et al.* 2009, authors' own data), and surveys in nearby Anap–Muput Forest Management Unit (in Hon *et al.* 2008) also discovered no Stink-badgers.

Although no individual survey lasted long enough to expect it to detect all carnivore species in the survey area, in combination their lack of Stink-badger records is strong evidence for the species's absence from most of Sarawak. Also relevant is that Hose (1893), who had wide collecting experience in central Sarawak, evidently never encountered the animal, having to refer to A. Everett as an authority for including it in his list of the mammals of Borneo.

Moreover, several surveys within the species's Sarawakian range did not find it. In Pulong Tau National Park (the most northern part of Sarawak), neither a recent camera-trapping survey (P. Dagang verbally 2011), nor a nine-day intensive survey in 1998 focused on Sumatran Rhinoceros *Dicerorhinus sumatrensis* (Anonymous 1998) found Stink-badger, although the latter may not have used methods likely to find the species. Small mammal surveys conducted by University Malaysia Sarawak (UNIMAS) at Gunung Murud and Kelabit Uplands of Bario (Rahman *et al.* 1998, Faisal *et al.* 2007, Tuen *et al.* 2007, Wiantoro *et al.* 2009), did not record this species. Intensive camera-trapping in the mix of logged-over and unlogged forests of the upper Baram (Miri Division) recorded 14 species of small carnivores (Mathai *et al.* 2010), but did not photograph Stink-badger, nor did local people apparently know of the species. This area lies just south of the cluster of records from the Kelabit uplands and Gn. Murud, suggesting, given the high effort of this survey, that this part of the upper Baram may be just outside the species's southern limit in Sarawak. Surveys for the 1982 management and development plan for Gunung Mulu NP did not find the species, despite recording eight other carnivores (Cranbrook 1982), and despite a subsequent record there (Table 1).

This localised distribution in Sarawak contrasts with its status in Sabah, where it is widespread and locally common (e.g. Medway 1977, Matsubayashi *et al.* 2007, Wilting *et al.* 2010). The reasons for this difference cannot presently be determined.

Natural history notes

Other than the brief notes and speculations in Payne *et al.* (1985), no published information was traced specific to Stink-badger ecology, habitat preferences and social behaviour in

Borneo. Nor did any source seek to explain its patchy distribution throughout Borneo generally and in Sarawak particularly. All historical Sarawak records come from the mid-montane zone, but a recent record from Kuala Lawas in the far north was from sea-level (Table 1). The altitudinal range occupied may vary across this species's range, and indeed in neighbouring Sabah it seems to be predominantly lowland (Payne *et al.* 1985). Some historical sources mentioned that Sunda Stink-badger inhabits caves (Forbes 1879, Moulton 1921 [who based his assessment on local reports]), but Banks (1931) considered it to dwell in holes in the ground dug by itself or by porcupines (Hystricidae). This latter statement may have been based on Lönnberg & Mjöberg (1925), who stated that it burrowed in the ground amid open forest in the Kelabit Uplands.

The historical authors' comments on the animal's defence are not exaggerated. Two people (C. Kri and Mohd Ali of Sarawak Forestry Corporation) tried to free an animal stuck in a kitchen at Kuala Lawas in 2010 (O. B. Tisen *in litt.* 2011; see Table 1), but had to abandon the attempt when the Stink-badger sprayed the area. The animal managed to free itself and disappeared into the forest, but a very distasteful smell lasted for the whole evening. Some occupants of Sri Tanjung were overpowered by the smell, resulting in severe vomiting. The workers cleaned the location with the most powerful detergent available (Clorox), but a year later, the smell still lingered on (O. B. Tisen *in litt.* 2011).

Threats

The localised distribution of Sunda Stink-badger in Sarawak seems to be a natural pattern of long standing, not the result of a recent decline. Too little is known about its population, present or past, to determine if numbers have decreased (or indeed increased) recently. There is no clear recent information on threats to Stink-badgers in Sarawak, but Lönnberg & Mjöberg (1925: 512) noted that "in most of the Kalabit's [= Kelabit] houses flat badger skins, very much stretched in order to make large 'sitting mats', were found", reflecting the source of the three specimens Moulton (1921, 1922) discussed. Banks (1931: 62) added that "the Kalabit dogs find the entrance to these [Stink-badgers'] earths and the smallest dogs will eagerly enter and bay the quarry underground while the men dig furiously down from above with the aid of sharpened sticks . . . Kalabits . . . eat the animal and value its skin for sale to down country people, who mix the shavings with water and drink them as a cure for fever or rheumatism".

The species seems generally tolerant of habitat degradation, fragmentation and even conversion to non-forest (e.g. Payne *et al.* 1985), suggesting that it is unlikely to be threatened by recent habitat changes in Sarawak. Although the species is listed globally as Least Concern by *The IUCN Red List of Threatened Species* (Long *et al.* 2008), this does not imply that it is not of conservation concern in certain parts of its range, such as Sarawak. Equally, a localised distribution does not necessarily imply a conservation need. Only further study and assessment in the state, including the publication of all records of the species, would clarify its conservation status and needs, if any.

Legal protection status of Sunda Stink-badger in Sarawak

In Sarawak, Sunda Stink-badger, unlike civets, mustelids and mongooses, is not protected in the Wildlife Protection Ordinance, 1998 (State of Sarawak 1998a, 1998b). This reflects the generally low interest in this species in the state. It is protected in two of the other parts of Borneo, Sabah through the Wildlife Conservation Enactment 1997 (Sabah Government 1997) and Indonesia (Wildlife Protection Ordinance 1931, 1979). Given its small range in Sarawak, it would seem to be as much, or more, in need of legal protection there, too.

Acknowledgements

The authors thank Oswald Braken Tisen and Paschal Dagang (Sarawak Forestry Corporation) and Vladimir Dinets for records of Stink-badgers and information about surveys; and Andreas Wilting for forwarding information about Sarawak records of *Mydaus* obtained for the Borneo Carnivore Database. Our gratitude is also extended to Alfonso McKenzie and Rodney Scott (Sarawak Forestry Corporation), and Engkamat Lading (Sarawak Forest Department) for their help in providing general mammal species list in their respective survey areas and to Helen Porter, Assistant Librarian, Royal Asiatic Society, for a copy of Moulton (1922). Jonathan Fleming prepared the map.

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