

Recent photographic records of Otter Civet *Cynogale bennettii* from Brunei, Borneo

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Abstract

Otter Civet *Cynogale bennettii* is an endangered semi-aquatic viverrid found in the Thai-Malay Peninsula and on the islands of Sumatra and Borneo. The habitat requirements and distribution of this elusive, infrequently observed and apparently rare species remain largely unknown, hindering conservation planning. Here we report several camera-trap records, dating from 2018 and 2020, of the enigmatic Otter Civet from three locations in Brunei Darussalam. One camera-trap recorded an adult and an offspring together. These photographic records contribute to our knowledge of the current distribution of Otter Civet in Brunei and add records to its presence in lowland dipterocarp forests on Borneo. Protection of wetland habitats as well as lowland dipterocarp forests is important for this species

Keywords: Viverridae, semi-aquatic small carnivore, tropical lowland forest, swamp forest, logging, camera-trapping

Introduction

The Otter Civet *Cynogale bennettii* is one of the least known small carnivores of the family Viverridae. The species has a Sundaic distribution and is found on the Thai-Malay Peninsula, Sumatra and Borneo (Veron *et al.* 2006). The paucity of recent Otter Civet records, despite the growing number of intensive camera-trap programmes in the region, suggests that it occurs patchily and at low population densities throughout its range. Morphological adaptations in the Otter Civet, including broad, webbed feet, dorsally opening nostrils and specialized muscles to prevent the ingress of water to the nose and ears when submerged, strongly point to a semi-aquatic lifestyle (Pocock 1915, Schreiber *et al.* 1989) and the species is thought to be closely associated with wetlands (Cheyne *et al.* 2016).

Population declines inferred from the loss of wetlands (largely from logging) throughout its range underpin the classification of the Otter Civet as Endangered (Ross *et al.* 2015). Reports of Otter Civet being hunted and kept as pets in Kalimantan, the Indonesian

part of Borneo (Bouhuys 2019), suggest another threat to the population on Borneo. The fine-scale distribution and habitat requirements of this species are poorly known, hindering conservation planning. On Borneo, the species occurs in coastal and lowland wetland forests, particularly peat-swamp and freshwater swamp forests (Cheyne *et al* 2015; 2016). Sightings have also been reported from lowland dipterocarp forests (Sebastian 2005; Ross *et al.* 2015). The species has also been recorded in secondary logged forests (Cheyne *et al.* 2016, Heydon & Ghaffar 1997, Ross *et al.* 2017) and in degraded and fragmented habitats (Evans *et al.* 2016).

There is limited information available on this species in Brunei, northern Borneo. There are two confirmed records from Brunei: one from Tasek Merimbun (Yasuma & Abdullah 1997) and one from Sungai Ingei (Charles 2012). Here we present photographic records of Otter Civet from three additional locations in Brunei.

Otter Civets camera-trapped in three locations

Camera-traps (Reconyx Hyperfire 2 Covert IR and Bushnell Trophy Cam HD digital camera-traps) were deployed in forest trails near or along streams, attached to tree trunks. The study areas were located in selectively-logged (Labi and Selapon) and unlogged (Ulu Temburong National Park) mixed-lowland dipterocarp forest (Fig. 1). The camera-traps were deployed to survey the occurrence of small carnivore species in the area and were set at 30-50 cm above ground level.

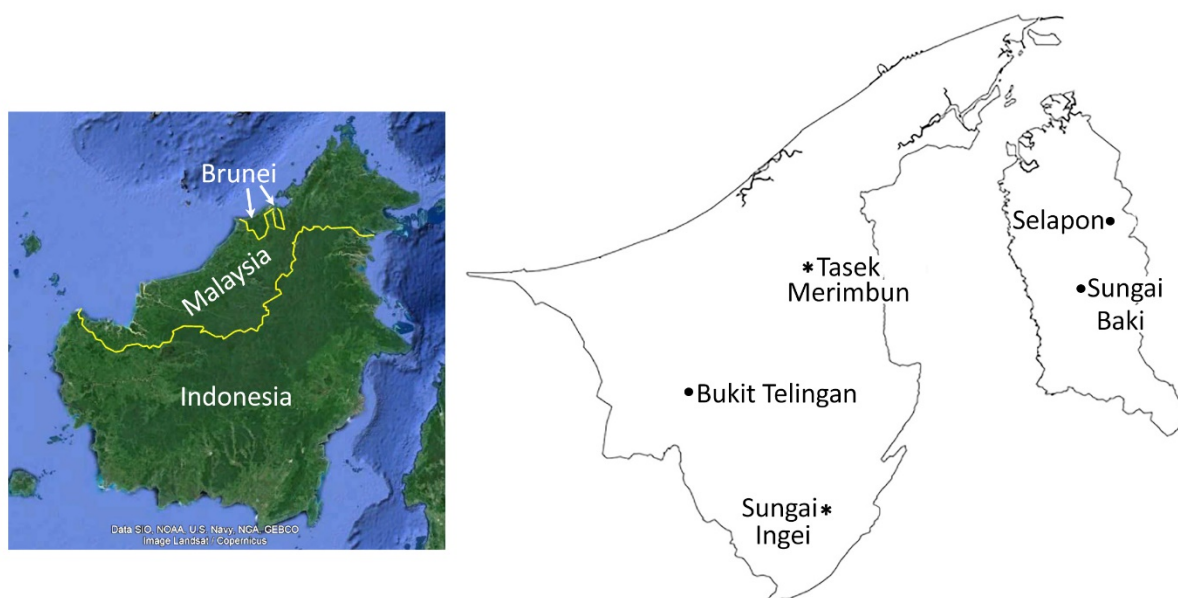


Fig. 1. The island of Borneo (left; based on a Google Earth map) and map of Brunei Darussalam (right) showing the locations of camera-trap records reported herein at Bukit Telingan, Selapon and Sungai Baki. Previous records from Tasek Merimbun and Sungai Ingei are indicated with asterisks.

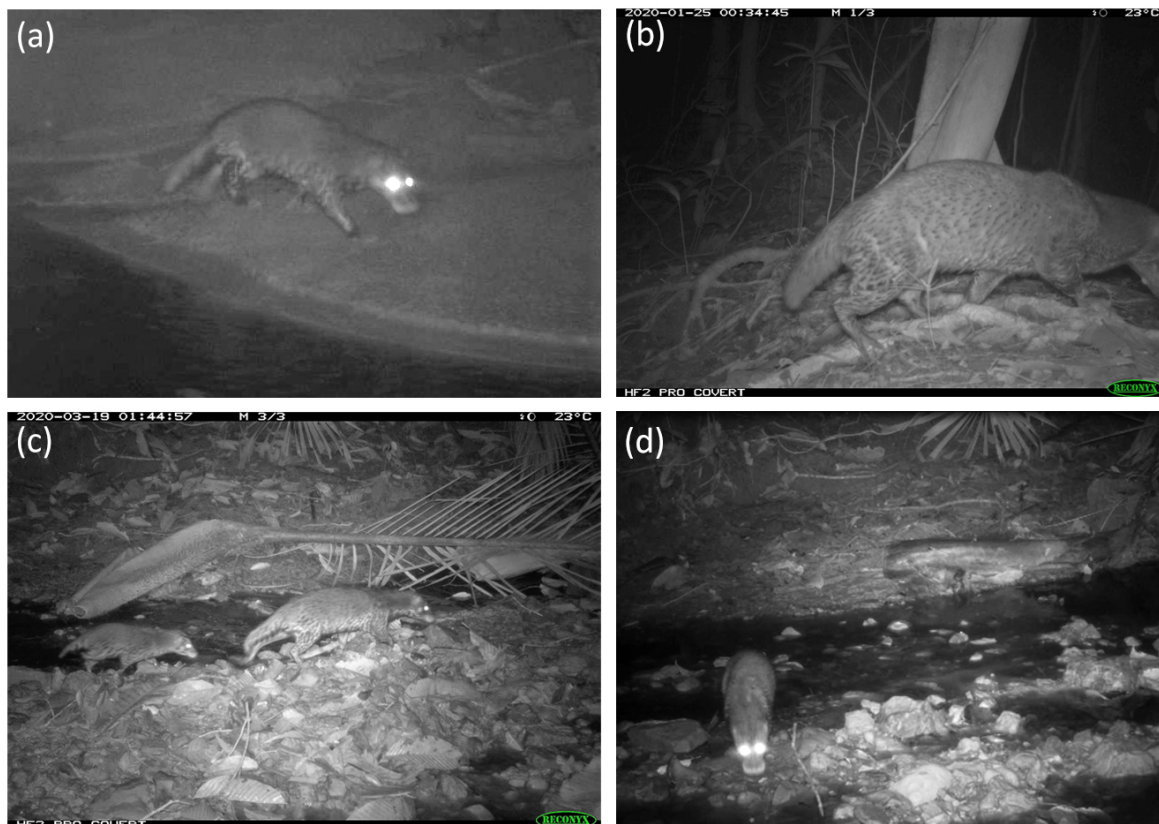


Fig. 2. Camera-trap images of Otter Civet *Cynogale bennettii* at Bukit Telingan, Labi, Brunei: (a) adult, 22h47, 12 January 2020; (b) adult, 00h34, 25 January 2020; (c) adult and offspring, 01h44, 19 March 2020; (d) adult, 19h33, 20 April 2020.

First location

The Otter Civet was recorded five times at three spots along 480 m of a stream at Bukit Telingan, Labi, in the Belait district of Brunei (4°21'40"N, 114°28'59"E). On 12 January 2020 an Otter Civet (Fig. 2a) was camera-trapped along the riverbank of a stream. On 25 January 2020 another animal (Fig. 2b) was captured on a small ridge between a loop of the same stream. On 19 March 2020 a camera-trap recorded an adult and an offspring Otter Civet (Fig. 2c) walking downstream, confirming the presence of a breeding unit in the area. There is little information on the breeding patterns of Otter Civets. The only report of breeding in the literature is from Peninsular Malaysia (Yong 2017) and there is no known breeding record in captivity (Veron *et al.* 2006). The next night, on 19 March 2020, an individual was captured walking upstream at the same site. On 20 April 2020 a camera-trap recorded a video of a solitary Otter Civet that was foraging and feeding (Fig. 2d). The camera-trap station was located along a small rocky stream. The animal recorded on camera on 19 March and on 20 April may represent the same or two different individuals.

Second location

The Otter Civet was recorded once at Selapon, in the Temburong district of Brunei (4°40'49"N, 115°13'19"E) on 13 August 2018. The Otter Civet (Fig. 3) was camera-trapped on the bank of a stream in a disturbed logged forest.



Fig. 3. Camera-trap image of an adult Otter Civet *Cynogale bennettii* at Selapon, Temburong, Brunei, on 13 August 2018 at 02h58.

Third location

The Otter Civet was recorded three times at the same stream at Sungai Baki, around the vicinity of the Kuala Belalong Field Studies Centre in the Ulu Temburong National Park (4°32'27"N, 115°9'58"E) in the Temburong district of Brunei on 12 February 2020 (Fig. 4).



Fig. 4. Camera-trap image of an adult Otter Civet *Cynogale bennettii* at Sungai Baki, Ulu Temburong National Park, Brunei, on 12 February 2020 at 23h48.

Discussion

The new photographic records of Otter Civet from Brunei, Borneo, add to our understanding of the distribution of the species. In the predictive Habitat Suitability Index models by Cheyne *et al.* (2016) most of Brunei is highly suitable for Otter Civet. Low to moderate elevation areas and wetlands were predicted by the model to be high suitable habitats and these habitats should be protected for this species. However, it should be noted that Cheyne *et al.* had only one historical record from Tasek Merimbun fitted into the model, which underscores the urgent need for survey efforts in Brunei. Others have recorded the species in peat-swamp forests and freshwater swamp forests (Cheyne *et al.* 2015, 2016), secondary logged forests (Heydon & Ghaffar 1997, Cheyne *et al.* 2016, Ross *et al.* 2017) and degraded and fragmented habitats (Evans *et al.* 2016). Sightings have also been reported from lowland dipterocarp forests on Borneo (Sebastian 2005, Ross *et al.* 2015). Our photographic records contribute to our knowledge of the current distribution of Otter Civet in Brunei and add records to its presence in lowland dipterocarp forests on Borneo. Therefore, protection of wetland habitats as well as lowland dipterocarp forests is important for this species. Brunei should remain a priority area for further surveys to determine the current distribution, status and threats to the Otter Civet.

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