

The first records of Yellow-bellied Weasel *Mustela kathiah* from Cambodia

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Abstract

The first records of Yellow-bellied Weasel *Mustela kathiah* from Cambodia comprise three photographs from three well-separated camera-trap stations in the Central Cardamom Protected Forest in the south-west of the country in December 2013 – March 2014. The records, consistent with those in neighbouring countries, were from evergreen hill-forest.

Keywords: camera-trapping, Central Cardamom Protected Forest, distribution record, evergreen forest, extension of known range

កំណត់ត្រាលើកដំបូងនៃ *Mustela kathiah* នៅប្រទេសកម្ពុជា

សង្ខេប

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Introduction

Yellow-bellied Weasel *Mustela kathiah* is a small carnivore found in northern India through the Himalayas into much of southern China and northern South-east Asia (Corbet & Hill 1992). It has never been recorded for Cambodia, but there are historical and/or recent records from the nearby countries of Lao PDR, Myanmar, Thailand and Vietnam (Duckworth & Robichaud 2005, Long & Minh 2006, Than Zaw *et al.* 2008, Supparatvikorn *et al.* 2012). It shows some tolerance to degraded habitats, and is usually found over 1,000 m asl in a range of habitats including montane evergreen forest, scrub and grassland (e.g. Duckworth & Robichaud 2005, Supparatvikorn *et al.* 2012). The first records of Yellow-bellied Weasel from Cambodia were generated by a camera-trap survey to record Mainland Clouded Leopard *Neofelis nebulosa*, the abundance of its prey, and other members of its guild in the southern part of the Central Cardamom Mountains Protected Forest.

Study Site

Central Cardamom Protected Forest (Central Cardamom PF) is located in southwest Cambodia and spans three provinces: northeast Koh Kong, southern Pursat and northwest Kompong Speu. It is the largest protected forest in Cambodia, covering an area of 4,013.13 km². The Central Cardamom PF is contiguous with Phnom Samkos Wildlife Sanctuary to the northwest and Phnom Aural Wildlife Sanctuary to the east, forming a combined total area of 9,845.65 km². The climate is highly seasonal with a wet season from May to October and a dry season from November to April, during which time precipitation is rare. The annual rainfall is 3,000–4,000 mm (Daltry & Momborg 2000). The average temperature remains high throughout

the year, generally between 25 °C and 30 °C, except at higher elevation where it is approximately 20 °C. The coldest months are December and January, when temperatures at the plateau can drop below 10 °C at night. The Central Cardamom PF consists of evergreen forest (89.5%), semi-evergreen forest (3.5%) and deciduous dipterocarp forest (2.5%). Across the Central Cardamom PF, elevation varies from 200 m to over 1,400 m. It supports globally threatened species including Asian Elephant *Elephas maximus*, Dhole *Cuon alpinus*, Siamese Crocodile *Crocodylus siamensis* and White-winged Duck *Cairina scutulata*, plus the near-endemic Chestnut-headed Partridge *Arborophila cambodiana* (Daltry & Momborg 2000). The Central Cardamom PF was already known to support a wide range of small carnivores (Holden & Neang 2009).

Methods

Between 5 December 2013 and 26 March 2014, commercially available trigger infrared, remote-trip digital camera-traps (Cuddeback digital Ambush IR Model: 1187) were used to survey within the southern part of Central Cardamom PF. Altogether 162 camera-traps were deployed, set in pairs at 81 stations covering an area of approximately 110 km². The camera-trap stations were selected to maximise the chances of encountering Clouded Leopard. A total of 8,152 camera-trap-nights were achieved.

Fifty camera-trap stations were along animal tracks and ridges, two on old logging roads, 13 along trails infrequently used by people, 10 along the trails close to rivers, five close to paths and one on a dried river bed. Seventy were in evergreen forest and 11 in other forest-types. Each camera-trap was approximately 30 cm above ground, allowing the photo-capture of animals ranging in size from rats (Muridae) to Sambar *Cervus*

Table 1. Records of Yellow-bellied Weasel *Mustela kathiah* by camera-traps from the Central Cardamom Protected Forest, Cambodia. All records of Yellow-bellied Weasel were from evergreen forest.

Date, time	Coordinates (WGS 1984)	Altitude	Habitat and other notes
13 Dec 2013, 14h29	11°52'09.5"N, 103°31'51.1"E	1,160 m	858 m from a river
26 Jan 2014, 13h38	11°51'39.6"N, 103°30'15.9"E	1,140 m	Along an animal trail, 1,737 m from a river
21 Mar 2014, 12h17	11°53'57.9"N, 103°31'15.4"E	860 m	Along an animal trail, 191 m from a river



Fig. 1. Camera-trapped Yellow-bellied Weasel *Mustela kathiah*, Central Cardamom Protected Forest, Cambodia, 13 December 2013.



Fig. 2. Camera-trapped Yellow-bellied Weasel *Mustela kathiah*, Central Cardamom Protected Forest, Cambodia, 26 January 2014.

unicolor. Camera-traps were set to be operational for 24 hours and all photographs were digitally stamped with the date and time. Successive photographs of the same species at the same camera-trap were defined as notionally independent when separated by more than 30 minutes. Camera-trap stations were at least 500 m apart. GPS receivers (Garmin eTrex10 and Garmin 60csx) were used to record the location of each camera-trap station. Altitudes based on 90 m digital elevation data from Shuttle Radar Topography Mission (USGS 2004) were calculated for each camera-trap station using Quantum GIS (v.2.2.0) and GRASS GIS (v6.4.3) software.



Fig. 3. Camera-trapped Yellow-bellied Weasel *Mustela kathiah*, Central Cardamom Protected Forest, Cambodia, 21 March 2014.

Results

In total, 3,955 photographs resulting from 2,113 notionally independent encounters of 39 species of wildlife were recorded, comprising 29 species of mammal and 10 of bird. These included 12 (one Endangered, seven Vulnerable and four Near Threatened) categorised as globally threatened or Near Threatened on *The IUCN Red List of Threatened Species* (IUCN 2014). Yellow-bellied Weasel was recorded from three different locations (Table 1). The minimum distance between each of these three camera-traps was 3 km, suggesting that three different individuals are likely to have been involved. These photographs (Figs 1–3) are the first records of this species in Cambodia. All were from evergreen forest that had been selectively logged during the 1990s.

Discussion

These Yellow-bellied Weasel records are the first of any weasel *Mustela* from Cambodia. They are not unexpected, for two reasons. First, mammals were poorly collected in Cambodia during the main phase of international biological exploration (Walston 2001). Thus, several other species of small carnivore have been recorded as new for the country since a resurgence of surveys in the late 1990s, including Spotted Linsang *Prionodon pardicolor* (Kong & Tan 2002), Small-toothed Palm Civet *Arctogalidia trivirgata* (Walston & Duckworth 2003) and Large-toothed Ferret Badger *Melogale personata* (Schank *et al.* 2009). Secondly, several recent records in neighbouring countries show how well Yellow-bellied Weasel can escape detection, notably in Thailand (Supparatvikorn *et al.* 2012). It seems that, in common with other South-east Asian weasels,

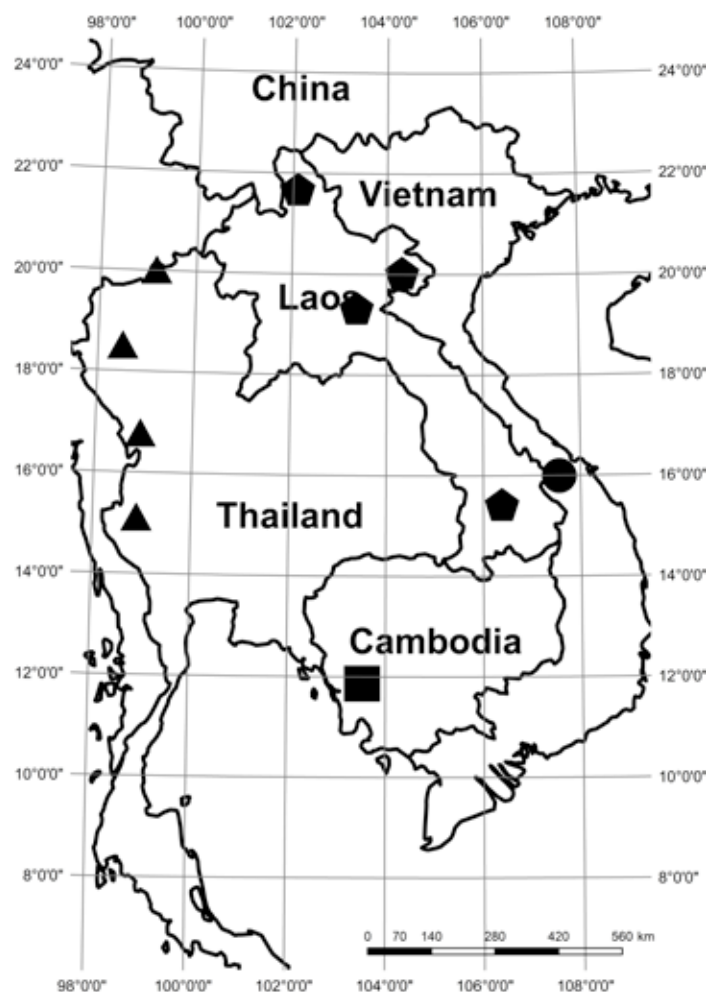


Fig. 4. Records of Yellow-bellied Weasel *Mustela kathiah* in Cambodia (square), all known records from the neighbouring countries of Lao PDR, pentagon (after Duckworth & Robichaud 2005) and Thailand, triangle (after Supparatvikorn *et al.* 2012), and the southernmost known record from Vietnam, circle (Long & Minh 2006). Symbols indicate general areas when there are several records in proximity.

the species is not readily camera-trapped (Supparatvikorn *et al.* 2012). Thus, its range may remain underestimated. At present, these records are the southernmost in the world (Fig. 4): the previous southernmost were from about 15°N in both Thailand (Thung Yai Naresuan Wildlife Sanctuary) and Lao PDR (Bolaven plateau) (Duckworth & Robichaud 2005, Supparatvikorn *et al.* 2012). In common with most other South-east Asian records, they come from in or near evergreen forest in hill areas (above 1,000 m). Most camera-trapping in Cambodia has occurred in the lowlands (below 700 m), particularly in deciduous-dominated landscapes (e.g. Gray *et al.* 2014). This may have contributed to the late discovery of Yellow-bellied Weasel in the country.

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