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Recent camera-trap records of Large-spotted Civet *Viverra megaspila* from Vietnam

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Abstract

We present recent camera-trapping records of Large-spotted Civet *Viverra megaspila* from Tay Hoa Watershed Protection Forest, located in the Deo Ca area of Dak Lak Province, Vietnam. Photographs were obtained on 3 April, 25 April, and 1 May 2021 in lowland secondary semi-evergreen forest with dense undergrowth. The photographs represent the first confirmed record of the species in Vietnam in the last five years. Other carnivores detected were Ferret Badger *Melogale* sp., Common Palm Civet *Paradoxurus hermaphroditus*, and Yellow-throated Marten *Martes flavigula.*

Keywords: camera-trap, endangered species, Large-spotted Civet, Vietnam, Viverridae

The Large-spotted Civet *Viverra megaspila* is listed as Endangered on the IUCN Red List of Threatened Species and has undergone severe declines as a result of habitat loss and unsustainable hunting (Timmins et al. 2016). Historically, the species occurred across large parts of mainland South-east Asia. Now rare or absent in many parts of its former range (Timmins et al. 2016), it has been identified as a priority species for small carnivore conservation in the region (Willcox 2020). Population declines are believed to have been particularly severe in Vietnam, on account of forest conversion that has markedly reduced lowland habitat (Namkhan et al. 2021) and high levels of indiscriminate snaring across most forests in the country (Belecky & Gray 2020).

In the last 20 years, there had been only three confirmed species records from Vietnam: a camera-trap photograph in Yok Don National Park in 2003 (Eames et al. 2004); two captive individuals in a village near the border of Takou Nature Reserve in 2009–2010 (Willcox et al. 2012); and a camera-trap image in Phong Dien Nature Reserve in 2016 (Viet-Nature Conservation Centre 2016). Timmins et al. (2016) noted that the few confirmed records of Large-spotted Civet in recent years in Vietnam indicate that it "is probably very close to national extinction if not gone already."

Here, we present three new records of Large-spotted Civet from Vietnam. From 24 March to 11 September 2021, we set 19 Reconyx HC550 HyperFire camera-traps in Tay Hoa Watershed Protection Forest, located in the Deo Ca area of Dak Lak Province (approximate coordinates 12°54'N, 109°16'E). Cameras were programmed to take a three-photograph burst with no delay between triggers and were placed 20–40 cm above the ground, opportunistically along animal trails, water sources, and ridgelines. Cameras were not set to target any single species, but rather were part of a general assessment for ground-dwelling mammal and galliform species. Camera-trap elevational range was 10 to 431 m (187.42 ± 157.09). Camera spacing varied from 13 to 5059 m (2529.25 ± 1545.17). The total area covered by the survey, calculated from a minimum convex polygon of all stations, was approximately 857 ha. Of the 19 cameras, six cameras were lost and one had its memory card stolen, and we therefore retrieved data from 12 units. Cameras were operational for 16–171 days (128.83 ± 49.50), with a total camera-trapping effort of 1540 trap nights.

We recorded three notionally independent events of Large-spotted Civet (assuming an independence threshold of one hour) from two camera-traps on 3 April, 25 April, and 1 May 2021 (Fig. 1). All sequences were taken at night (01h07, 22h51, and 19h44, respectively) and all show a mature adult civet. The cameras were at elevations of 10 m and 64 m asl and were 695 m apart.

Fig. 1. Large-spotted Civet *Viverra megaspila* camera-trap photograph taken at 01h07 on 3 April 2021, Tay Hoa Watershed Protection Forest in Dak Lak Province, Vietnam. (Photo: ATP/IMC/Leibniz-IZW/Re:wild.)

Other carnivores detected were Ferret Badger *Melogale* sp. (eight independent detections at two stations), Common Palm Civet *Paradoxurus hermaphroditus* (three independent detections at two stations), and Yellow-throated Marten *Martes flavigula* (one detection). In addition to Large-Spotted Civet, no other particularly snaring-sensitive species were recorded in the survey.

The records came from secondary semi-evergreen forests with dense understorey vegetation. Both stations were in easily accessible areas close to rice fields and an acacia plantation. There were numerous signs of human activity in the forest, including the harvest of Arecaceae fruit and hunting, as indicated by (uncounted) wire snares and evidence of domestic dogs. The size of the overall Deo Ca forest area is approximately 26,000 ha. The area is isolated from other lowland forest blocks, and it is unlikely that Large-spotted Civet would be able to disperse to or from Deo Ca from nearby forest areas.

The new records provide welcome evidence that the Large-spotted Civet persists in Vietnam. In line with the rarity of the species in the country, we obtained only three records. As we only surveyed a small part of the total forest area in Deo Ca, we recommend further camera-trapping in the Deo Ca area, ideally using a systematic camera-trap grid in low-elevation (< 200 m asl) habitat, to assess the possibility of a population in the wider forest complex. The total area in Deo Ca under 200 m is approximately 6720 ha, representing a relatively large block of potentially suitable habitat for the species. With their large areas of lowland semi-evergreen forest, the Cat Tien and Dong Nai Nature Reserve complex would also be worth considering for future surveys.

That we recorded Large-spotted Civet from lowland semi-evergreen forests is consistent with what is known about its ecology: the species has been documented from a wide range of lower elevation habitat types (Duckworth 1994, Austin 1999, Lynam et al. 2005, Roberton 2007, Gray et al. 2010, Jenks et al. 2010). Our records also offer further confirmation that the Large-spotted Civet can use secondary forests close to human settlements and plantations (Lynam et al. 2005, Hamirul et al. 2015, Guo et al. 2017). The fact that a species with such flexible lowland habitat requirements is now rare across Vietnam highlights the impact that unsustainable hunting and habitat loss has had on its populations across the country. Should additional populations be found, threat reduction activities would be imperative, especially to reduce snaring. Although extensive tracts of lowland forest have largely been lost in Vietnam in preceding decades, some sizable areas remain.

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