

# Incidental killing of Sunda clouded leopard in Sarawak, Malaysia

**The Sunda clouded leopard *Neofelis diardi* is listed as Vulnerable on the IUCN Red List and is protected throughout its range. Little is known of its hunting in Sarawak, Malaysia. We conducted an opportunistic survey on the distribution of clouded leopard in Sarawak based on skins and reports of its hunting from 2013 to 2016. We also visited 38 towns and villages during this period. We asked local hunters if they own skins of Sunda clouded leopard and if they could show them to us. Based on this survey, the distribution of Sunda clouded leopard in western Sarawak appears to be patchy. Most of the records showed that the species persists in secondary and primary forest in central and northern Sarawak. Based on skins, a total of nine areas with Sunda clouded leopard presence have been identified. Killing of Sunda clouded leopard was mostly incidental and occasionally in self-defense with little evidence of cross boundary trade.**

The Sunda clouded leopard is known, as one of the largest carnivore species endemic to the Island of Borneo. *N. diardi* was classified as a new species by Wilting et al. (2007), corroborating previous studies by Buckley-Beason et al. (2006) and Kitchener et al. (2006). Christiansen (2008) demonstrated that *N. nebulosa* and *N. diardi* diverge in a number of unusual craniomandibular characters. Two subspecies of *N. diardi* were also recognised: the Bornean clouded leopard, *N. d. borneensis* and the Sumatran clouded leopard *N. d. diardi* based on genetic analysis and morphological results (Wilting et al. 2011).

Sunda clouded leopard has Totally Protected status in Sarawak according to Sarawak Wild Life Protection Ordinance 1998. Any offence leading to a conviction may lead to a fine of up to RM 25,000 (USD 6,250). However, a species included under this law can still be killed if the species is thought to cause harm to human life or danger to property and if enough warning has been given. Moreover, the carcass has to be surrendered to the controller of wildlife. Historical collection of specimens (since 1892 until 1983) of this species showed that it was mostly hunted in northern Sarawak (Mohd-Azlan et al. 2007).

In Sarawak, Sunda clouded leopards have been reported from primary forest of Lambir Hills National Park (Mohd-Azlan & Engkamat 2006), logging concession areas in Ulu Baram (Mathai et al. 2010), and secondary forest south-east of Bintulu (McShea et al. 2009). Even though the clouded leopards have been reported to thrive in secondary forest (Mohd-Azlan & Sharma 2006, McShea et al. 2009), the Sunda clouded leopard in Borneo seems to be negatively affected by logging (Brodie et al. 2015). Besides logging affecting habitat and prey species, hunting appears to contribute to the decline of this species on Borneo (Brodie et al. 2014). Logging activities in Sarawak have led to a vast network of logging roads, which inadvertently created access to previously inaccessible areas for hunters. Selectively removing apex predators such as the clouded leopard may have cascading effect on prey species density. The impact of hunting activities on the Sunda clouded leopard and other carnivores in Borneo are poorly understood (Hearn et al. 2016, Wilting et al. 2016). The main aim of this study is to evaluate the relative importance of the threat posed by killing to the Sunda clouded leopard. Here we report evidence of hunting and incidental killing of the species as pest in various areas in Sarawak. This provides locality information and highlights the threat of hunting and incidental killing to the long-term survival of this species in Sarawak.

## Methods

Our ongoing research to understand the carnivore species community also provides