

## Sulawesi's mysterious apex predator

By Iwan Hunowu & Alfons Patandung, 17th December 2019

The island of Sulawesi, Indonesia, has always fascinated naturalists and biologists for the role it played in formulating the theory of evolution. In 2019, the world celebrated 150 years since Alfred Russell Wallace wrote his classic book 'The Malay Archipelago', which stimulated his thinking of evolution by natural selection. This book was in part inspired by his time discovering and enjoying Sulawesi's rich and enigmatic wildlife, which includes an assemblage of mammal species, 62% of which are endemic to the island.

Sulawesi is the world's 11<sup>th</sup> largest island and home to two endemic pig species, the hairless babirusa and Sulawesi warty pig, and two endemic dwarf buffaloes species, the lowland anoa and montane anoa.



Sulawesi's mysterious apex predator, the Sulawesi Giant Civet, was found up to 1,079 m asl inside the forest of Bogani Nani Wartabone National Park. Photo: Bogani Nani Wartabone National Park and WCS Indonesia Program.

Yet, despite the presence of these relatively large ungulates (the pigs weigh 50–100 kg, the anoa up to 300 kg), the island's apex mammalian predator is—somewhat surprisingly—the small, slender and endemic Sulawesi civet *Macrogalidia musschenbroekii*, with a body weight of only 4–6 kg. Although top predators are typically well-studied across their range, the Sulawesi civet remains little known, with only scant data available on its distribution, habitat preferences and conservation status.

The only recent published records preceding our [study](#) were from a 2002 camera trap photo from Southeast Sulawesi (Lee et al., 2003). Previous sightings from the northern and central parts of Sulawesi date back to the 1980s (Wemmer & Watling, 1986; Whitten et al., 1987).



The Sulawesi Giant Civet was busy in the morning, starting its activities as early as 4:45 AM, then taking a rest before noon. Photo: Bogani Nani Wartabone National Park and WCS Indonesia Program.

Two other species of civet inhabit Sulawesi, both introduced by humans. Little is known about them: the common palm civet *Paradoxurus hermaphroditus*, which thrives in a variety of habitats across South-east Asia, surprisingly failed to establish itself on Sulawesi, whereas the Malayan civet *Viverra zangalunga* seems to have spread more widely across the island. The latter is thought to inhabit secondary forest and open land, possibly in response to niche competition with the Sulawesi civet.

Our [article](#) published in *Oryx* presents the findings of the first major survey of the Sulawesi civet, with 148 camera traps that covered an area of almost 1 million ha in northern Sulawesi, including Bogani Nani Wartabone National Park, Tangkoko Nature Reserve, Mount Ambang Nature Reserve and forest patches of varying habitat quality outside protected areas.



The Sulawesi Giant Civet was also active in the evening, foraging for food in the forest floors. Its striped tail with alternating rings of dark and brown was quite distinct. Photo: Bogani Nani Wartabone National Park and WCS Indonesia Program.

Using a 4 km<sup>2</sup> grid cell system with a single camera per grid cell, our survey covered the full range of land-use types in northern Sulawesi: primary forest, secondary forest, farmland and barren land. Despite a huge sampling effort—10,371 trap-nights—we recorded the Sulawesi civet only 17 times, at 12 locations.

Our findings suggest that the Sulawesi civet occupies a wider variety of habitat types than previously thought. In addition to primary forests, which were long thought to constitute its preferred habitat, we obtained records of this species in secondary forest and farmland—areas closer to human inhabitation and outside protected areas.





This elusive and shy animal was found not only in the primary forests but also in the secondary forests of Bogani Nani Wartabone National Park. Sulawesi Giant Civet photographed by the camera traps was found at ~4.6 to 9.8 km from the nearest human settlement. Photo: Bogani Nani Wartabone National Park and WCS Indonesia Program.

In the smaller landscape of Mount Ambang Nature Reserve, Sulawesi civets were only found in forests above 1,500 m altitude. Malay civets, in contrast, were only found in secondary forest and farmland at lower altitudes below 1,000 m.

The main threats to the Sulawesi civet are forest habitat conversion and, to a lesser extent, hunting for bushmeat. The Bogani Nani Wartabone National Park patrol team released a snared individual found on patrol near the edge of the Park. The Sulawesi civet has also been found in piles of bushmeat, together with other wildlife such as the Critically Endangered black-crested macaque and babirusa, during highway patrols conducted by the National Park staff.

Our findings provide valuable new insights on this rare and Vulnerable carnivore, and the results are feeding into the development of a landscape conservation strategy.

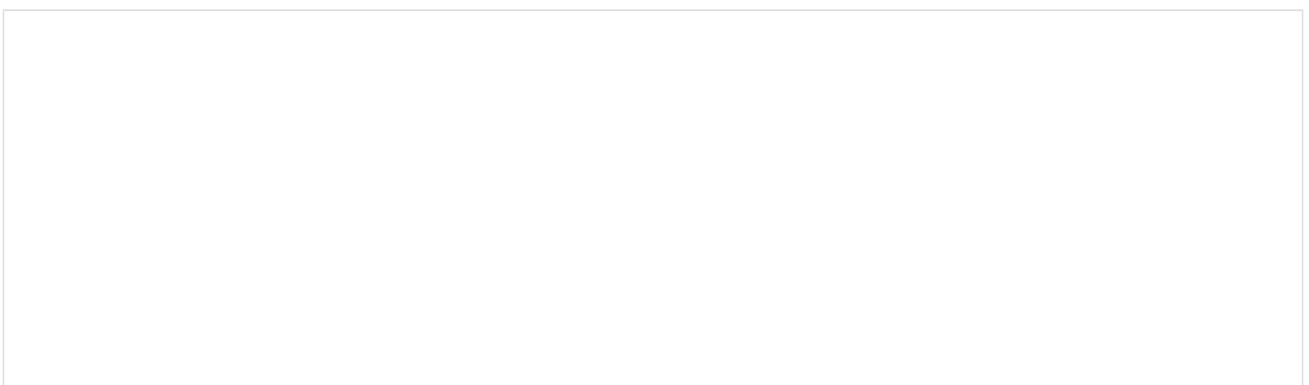


Primary forest is the main habitat of Sulawesi Giant Civet, but it also occurs in secondary forests and farmland.  
Photo: WCS Indonesia Program.

## References

- Lee, R.J., Riley, J., Hunowu, I. & Maneasa, E. (2003) The Sulawesi palm civet: expanded distribution of a little known endemic viverrid. *Oryx*, 37, 378–381.
- Wemmer, C. & Watling, D. (1986) Ecology and status of the Sulawesi palm civet *Macrogalidia musschenbroekii* *Biological Conservation*, 35, 1–17.
- Whitten, T., Henderson, G.S. & Mustafa, M. (1987) *The Ecology of Sulawesi*. Gajah Mada University Press, Yogyakarta.

The article [New insights into Sulawesi's apex predator: the Sulawesi civet](#) *Macrogalidia musschenbroekii* is available in *Oryx—The International Journal of Conservation*.





## Iwan Hunowu & Alfons Patandung

Iwan Hunowu began his professional conservation career with the Wildlife Conservation Society's Indonesia Program (WCS-IP) in 1999. Over the years, his passion and ornithological skills brought him to lead biodiversity surveys, and manage a conservation project for the remarkable Endangered maleo (*Macrocephalon maleo*), a bird which buries its eggs under up to a meter of sand. Iwan is now the Sulawesi Program Manager, heading up WCS-IP's work across the whole of the island.

Alfons Patandung is the Biodiversity Conservation Coordinator at the Wildlife Conservation Society's Indonesia Program (WCS-IP). He started working at WCS in 2013 and focuses on bird ecology, camera trap surveys and wildlife data analysis, particularly on Sulawesi.