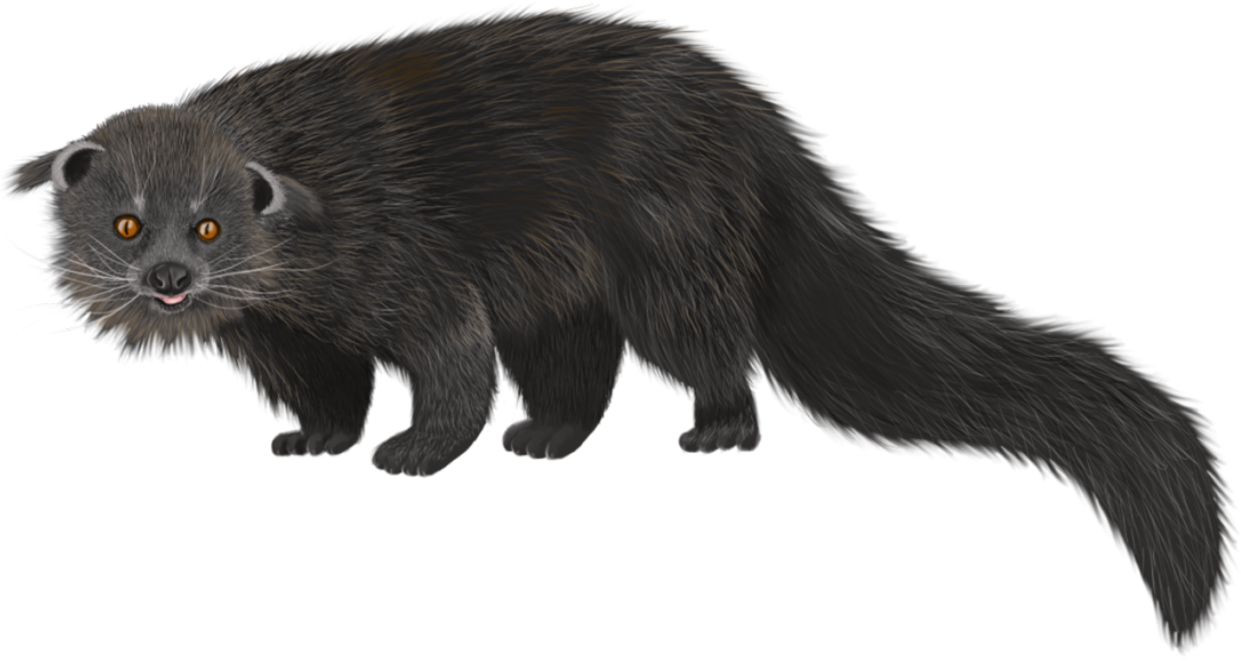
Oryx

Enter bearcats (or binturongs): the world's largest civets that are crucial to seed dispersal in the forests of Asia

By Arata Honda and Matthew Luskin, 4th July 2023

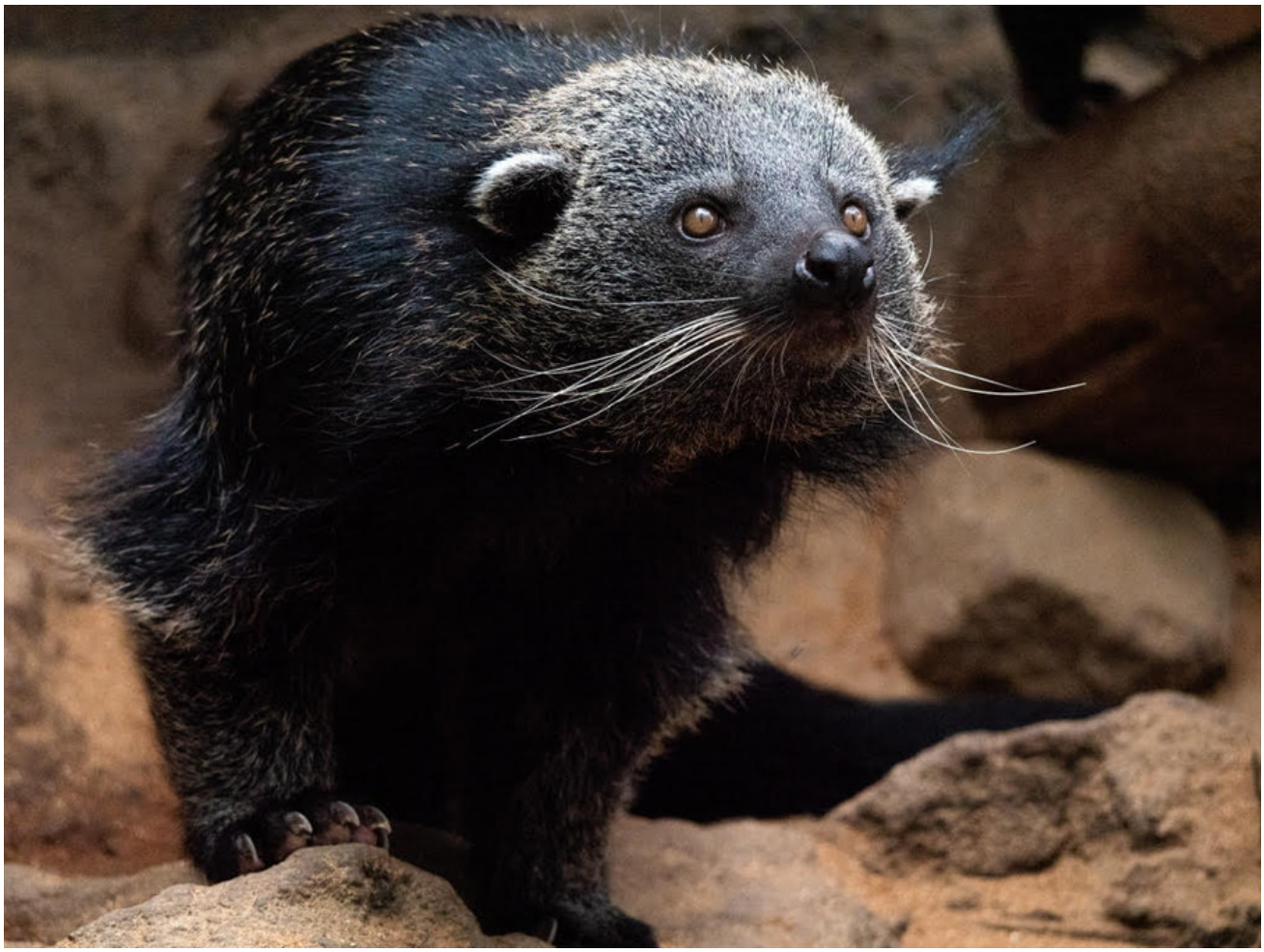
Weaving through the canopy, above Southeast Asia's more famous wildlife such as sun bears and deadly cats, is an elusive and lesser-known forest mammal—colloquially known as the bearcat. In reality, neither a bear nor a cat, the binturong *Arctictis binturong* is a large civet with a black coat and a face full of grizzled grey hair, giving it the appearance of a mysterious old man; even the young look old! Their tufted ears and prehensile tail endear them to anyone lucky enough to spot one, but why should we turn our attention to this peculiar animal?



Original copyrighted artwork of a binturong provided courtesy of T. Barber from Talking Animals.

Binturongs appear to have strayed from the evolutionary path of their ancestors. Although

they—together with cats, dogs and bears—belong to the order Carnivora, meaning meat eaters, they mostly feed on fruits. One potential problem with this type of diet is that in the forests of Southeast Asia, where binturongs live, most trees only fruit for a few months at a time, two or three times per decade; a phenomenon called masting. It is therefore no surprise that binturongs have developed a particular appetite for figs, a group of trees that fruit year-round and thus provides a reliable food source. Figs sustain countless animals, from birds and monkeys to ecologically invaluable fig wasps and flies. The binturongs' fondness for these fruits creates a symbiosis, with the species playing an important role in seed dispersal, especially for strangler figs. However, these enigmatic mammals are threatened with extinction. They are currently categorized as Vulnerable on the IUCN Red List, as rapid deforestation, conversion of rainforests to oil palm plantations, targeted hunting and indiscriminate snaring have drastically reduced their habitats and populations.



A captive binturong (Sapporo, Japan). Photo: Arata Honda.

Illuminating the ecology of the binturong has long been an intriguing puzzle, given the species' semi-arboreal, ninja-like lifestyle that often leaves researchers grappling with contradictory findings. Traditional methods based on direct observations , such as spotlighting (shining a bright light, often from a car, across the canopy along road transects), have been inefficient in uncovering the mystery surrounding binturongs, as these animals are shy and elusive, and thus notoriously difficult to detect. Fortunately, extensive camera-trapping efforts over the past decade have enabled researchers to gain insights into the lifestyle of binturongs across their vast range. Our

team compiled the largest known camera-trap database in Southeast Asia to demystify the binturongs' behaviour and habitat preferences. Because forests in much of the binturongs' range have been affected by human activities, we sought to compare between pristine, fragmented and degraded tropical forests.

Although binturongs have previously been known to thrive in primary, intact forests, we found them to be adaptable and resilient in habitats with moderate levels of human disturbance, including oil palm plantations and fragmented and degraded forests. However, in landscapes with less than 40% forest cover in a 20-km radius, binturongs were almost universally absent. This raises concerns for binturongs in human-dominated regions such as Singapore, where other, more common civets have managed to survive.

Binturong images captured in surveys by the Ecological Cascades Lab, led by Dr Matthew Luskin, at the University of Queensland, Australia.

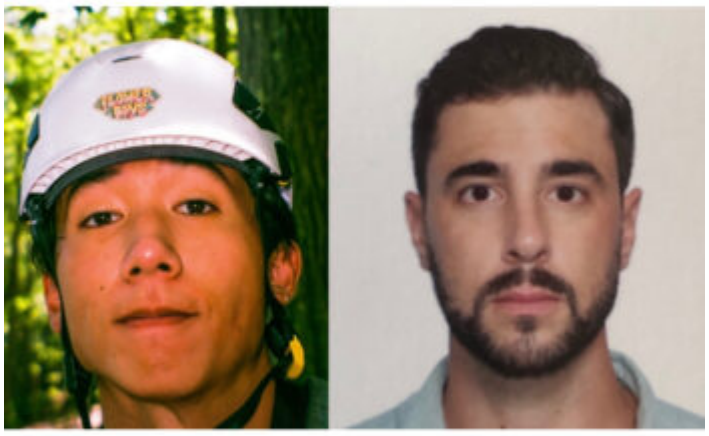
The camera-trap studies not only showed us the binturongs' preferred habitats, they also revealed that these creatures show crepuscular activity, meaning they are most active during twilight hours. In some areas, they also show notable peaks in activity around noon, but in human-dominated areas and along forest edges, we did not observe this. Instead, binturongs shifted their activity further into the night, probably to avoid peak times of human activity. This adaptability may explain how these ninja civets have managed to survive in moderately degraded forests and areas with some oil palm cultivation, and it could provide an explanation as to why previous studies on binturong activity patterns have reported conflicting results.

Our findings offer important insights for future binturong research and conservation. From a conservation perspective, the new findings suggest that preserving adequate forest cover is crucial, even in anthropogenically disturbed areas. We found binturongs to be resilient and adaptable to moderate levels of human disturbance, as long as there is sufficient forest cover across the broader landscape. Given this resilience to habitat changes, the observed declines in binturong populations could be linked to over-exploitation (many are hunted for bushmeat and traditional medicine, while others are captured for the exotic pet trade; read more), which warrants further attention.

Our study also emphasizes the value of intensive camera trapping for studying rare and elusive species. We captured only 54 detections of binturongs in a total of 58,608 camera-trap nights, highlighting the limited value of ground-based methods for arboreal species. Future studies would benefit from a combined use of canopy and terrestrial camera traps, which could offer more accurate estimates of binturong populations and distribution. Given the species' key role as fig seed dispersers, future research may also leverage advancing technologies such as GPS telemetry and drone-based surveys to study their movement and seed dispersal patterns in degraded and disturbed forests.

The survival of the binturong depends not only on their adaptability but also on our commitment to conservation. By promoting sustainable practices, fostering awareness and contributing to conservation initiatives, each of us can play a role in ensuring the survival of these animals. The tale of the binturong serves as a poignant reminder of the intrinsic worth of every species within the Earth's complex web of biodiversity. Understanding the resilience of these species to human disturbance can guide us towards protecting and restoring invaluable animals and forest ecosystems, thus preserving not just the binturong, but countless other species that share their home. The call of the binturong is clear: protect the forests, uphold the rich diversity of life they nurture, and remember that every species—regardless of its size, charisma or popularity—matters.

The article 'Binturong ecology and conservation in pristine, fragmented and degraded tropical forests' is available open access in *Oryx—The International Journal of Conservation.*



Arata Honda and Matthew Luskin

Arata Honda is a PhD student in the Department of Ecology and Evolutionary Biology at Yale University, and a former member of the Ecological Cascades Lab at the University of Queensland. He is interested in the ecology of arboreal animals, from the macroecological and macroevolutionary forces that have driven the tree-dwelling lifestyles of modern canopy inhabitants, to quantitatively and visually capturing the

minute dynamics within forest communities across space and time. He is particularly invested in advancing remote sensing applications for effective monitoring and conservation of these often threatened but overlooked species.

Dr Matthew Luskin heads The Ecological Cascades Lab at the University of Queensland School of Biological Sciences and is a Chief Investigator with the Centre for Biodiversity and Conservation Science. He is a broadly trained ecologist working at the nexus of land-use change, wildlife ecology, plant-animal interactions and conservation science. His work, carried out in tropical rainforests around the world, aims to understand the secondary cascading impacts of human activities on wildlife populations, and explores strategies for effective biodiversity conservation.