Why did the elephant cross the road? In Malaysia, they are trying to find the answer

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Credit: University of Nottingham

The body of an elephant calf lies on the side of a remote highway in the north of Peninsular Malaysia – the East-West Highway is flanked by two wildlife refuges, Royal Belum State Park and the Temengor Forest Reserve. It is stories like this in the Malaysian media that are of increasing concern to wildlife experts. They highlight the growing difficulty of human-elephant coexistence. As economic development forges ahead in Peninsular Malaysia so do the dangers to the country's wildlife.

Roads like the East-West Highway can pose huge challenges for landscape connectivity and the movement of wildlife. Research on how this road affects elephant movements has led to calls from a team of wildlife conservationists at the University of Nottingham Malaysia Campus (UNMC) and other partner institutions to avoid any further expansion of this road. They also want to see a reduction in and the

enforcement of speed limits as well as considering a limit on traffic volumes at night.

The research team spent five years GPS tracking 17 wild Asian elephants (Elephas maximus) to find out whether they cross this road, how often and where, and to model how their movements are affected by the road. The findings of their research – "Why did the elephant cross the road? The complex response of wild elephants to a major road in Peninsular Malaysia" – have been published in the academic journal *Biological Conservation*. They say the results are relevant for landscapes throughout Asia and Africa, where existing or planned roads fragment elephant habitats.

In an increasingly human-dominated world there are few places left where large animals can live without coming into contact with people and the human footprint. Roads lead to the destruction of vital habitat and are a particular threat to megafauna – very large animals, such as elephants, that also need very large home ranges to fulfil their ecological needs.

Tracking 17 wild elephants

Research student Jamie Wadey and his team, led by Dr. Ahimsa Campos Arceiz, from the School of Environmental and Geographical Sciences at UNMC, tracked the elephants using GPS-satellite collars programmed to record their location every two hours. They found that, although elephants are still able to cross, this road is actually an important barrier for elephant movement. The modelling of elephant movements showed two important results – first, elephants cross the road 80% less than it would be expected to if the road was not there; and second, that elephants are attracted to the roadsides by the amount of grasses and other early succession plants growing there. Spending time by the roadside exposes elephants to dangers such as speeding vehicles and

poaching. Two of the elephants in this study were poached for ivory, and a third survived a collision with a vehicle.

Jamie Wadey said: "Understanding when and where elephants cross the road can inform the design of mitigation measures. There is strong and consistent evidence that the East-West Highway constitutes a barrier to movement for elephants. We found most crossings took place at night. But, contrary to how elephants in Africa behave, Asian elephants seem strangely attracted to the roadside – possibly due to the more open habitat as a result of heavy logging and abundance of food along the grass verges."

Since the completion of this study the Malaysian government has constructed one wildlife viaduct along the East-West Highway. The research team is encouraging the Malaysian authorities to monitor the use of the viaduct to understand its effectiveness in providing landscape connectivity for elephants and other wildlife.

More effective measures needed to protect elephants

The research team believe the viaduct is not sufficient to promote connectivity in the landscape and therefore it should be considered as part of a suite of mitigation tools. They are calling for:

- Increased patrols and other anti-poaching efforts.
- Avoiding further road expansion.
- The reduction and enforcement of speed limits.
- Habitat management to detract elephants from using roadsides for foraging.
- Monitoring of the effectiveness of wildlife viaducts.
- Public engagement to modify driver behaviour on the East-West Highway and other roads crossing important wildlife habitats.
- Considering the option of controlling traffic volume at night.

Dr. Campos-Arceiz said: "We have described the complex ways in which a road affects the movements of elephants in this important landscape. We found that elephants are both attracted to and deterred by the road, but especially that, further increases in traffic volume or road capacity could result in terrible consequences for elephant mobility between both sides of the road. Our results have direct policy and management implication for elephant conservation in Peninsular Malaysia and other elephant range states."

More information: Jamie Wadey et al. Why did the elephant cross the road? The complex response of wild elephants to a major road in Peninsular Malaysia, *Biological Conservation* (2017). DOI: 10.1016/j.biocon.2017.11.036

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