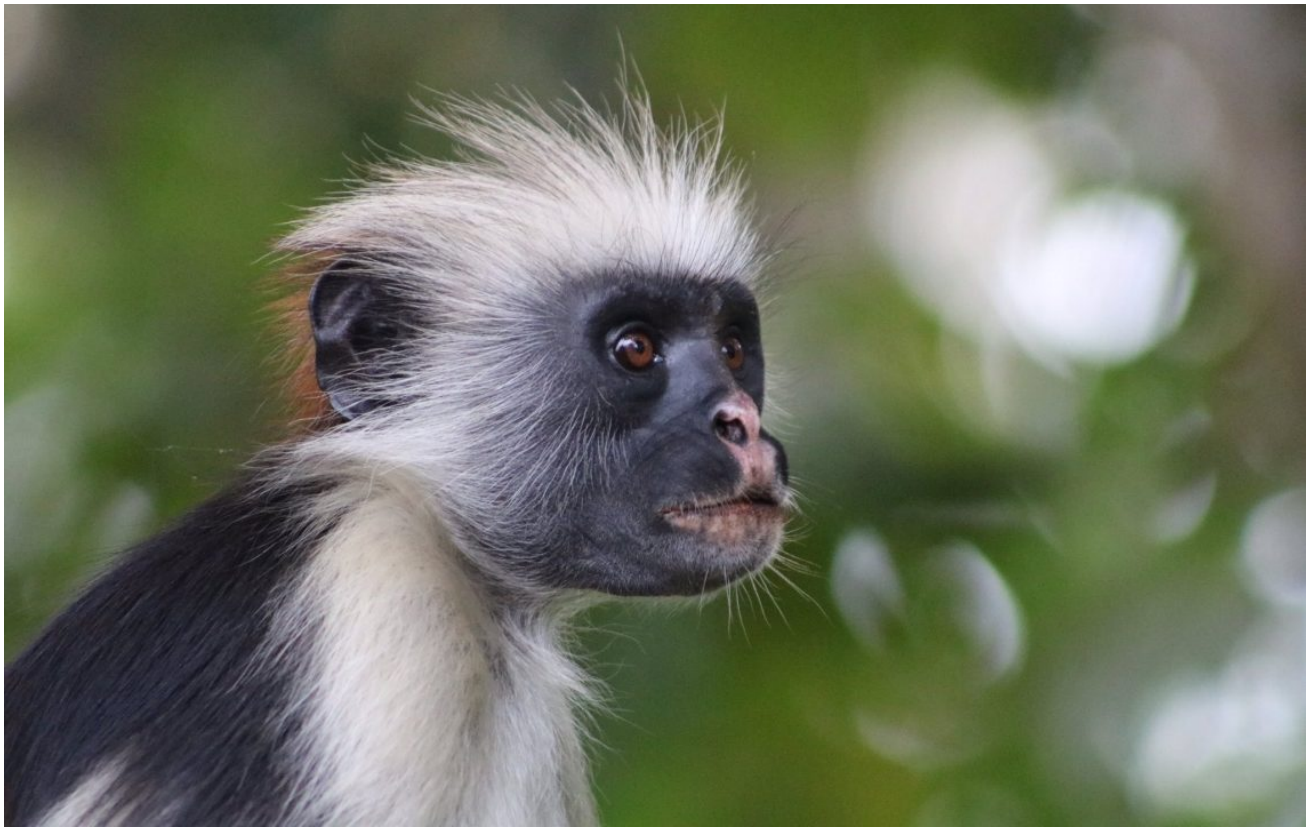
Oryx

# The colobus-saving speedbumps of Zanzibar

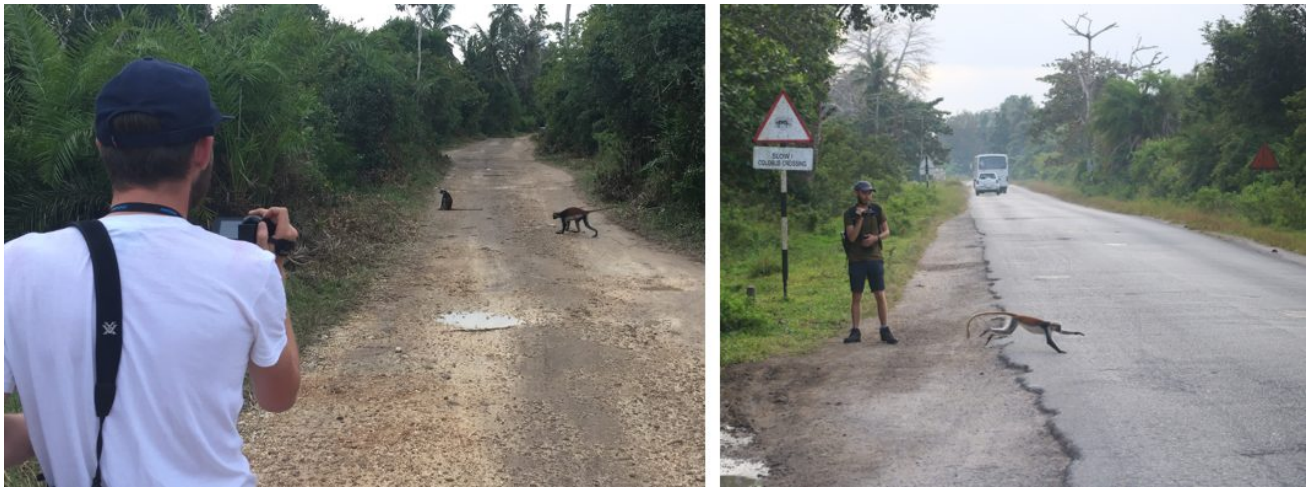
By Alexander V. Georgiev & Harry Olgun, 16th March 2021

The two of us stood on either side of the main road that intersects the southern end of Jozani-Chwaka Bay National Park in Zanzibar, a small island off the coast of Tanzania. This road cuts through rural landscapes and as it nears Jozani forest, the agricultural fields and shrubs give way to trees. There was a scattering of monkeys on both sides of the road, foraging through the shrubby vegetation on its verge, not far from the village and the fields. We couldn't see all the monkeys clearly. Suddenly, a young female jumped out of the shrubs, not far from us. She sprinted across the road into an oncoming car. We heard a distinct thud and the sound of something cracking.



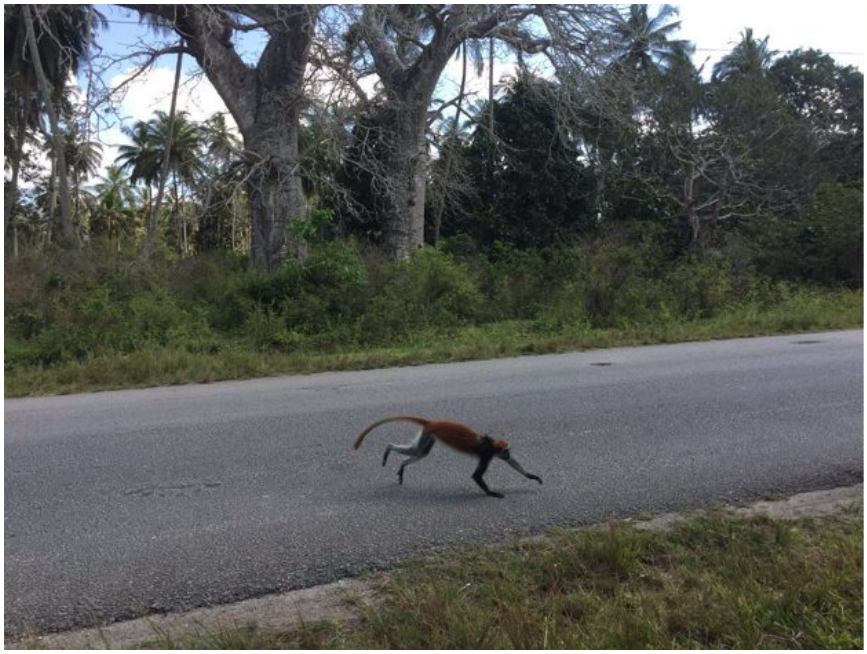
There are less than 6,000 individuals remaining of the Endangered and endemic Zanzibar red colobus. At Jozani, their main stronghold, some groups have seemingly adapted to living in heavily altered landscapes, outside their typical rainforest habitat. They forage on leaves and unripe fruit of non-native trees in orchards, and sometimes feed on crops in fields. Near the Park they are not hunted and so remain fairly relaxed around people. However, they haven't quite worked out how to safely cross the big, busy road that cuts through their home ranges, connecting the capital with the popular east coast beaches.

We never found the body of the monkey that was hit in front of our eyes. Maybe she survived and moved off with her group. Maybe she didn't. The outcome of many other collisions, however, have been well documented. Since we started working here a few years ago to study the Zanzibar red colobus, we have witnessed multiple such incidents and seen monkeys die not long after being hit. Our collaborators at Jozani-Chwaka Bay National Park have been keeping tally of roadkill for an even longer period of time.



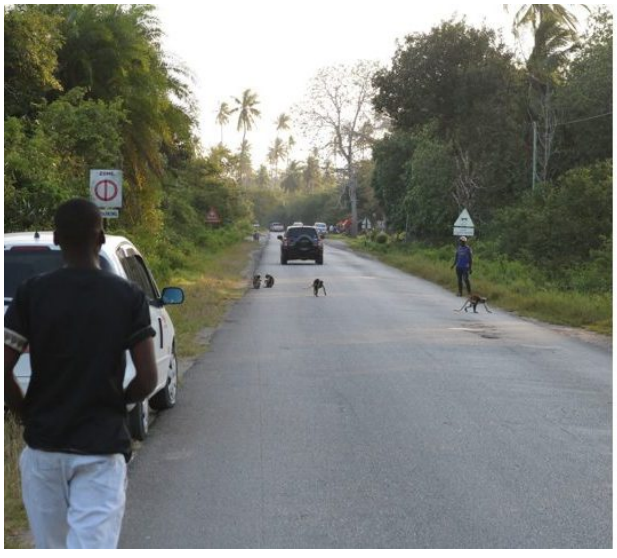
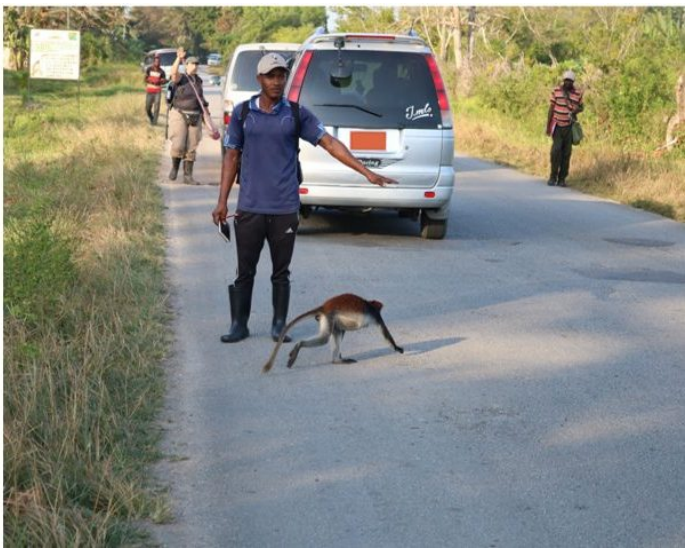
Harry Olgun video-recording the crossings of a Zanzibar red colobus on the roads at Jozani-Chwaka Bay National Park. The main tarmac road connects the east with the west coast and is busy even early in the morning. The dirt road connects the National Park's visitor centre with a mangrove walk is rarely used and vehicles travel at much slower speeds.

In our study we examined these data to estimate the impact that roadkill may be having on monkey numbers in this area. This may sound simple, but surprisingly very few primate studies have been able to report the number of animals killed per kilometre of road and provide some demographic context for these deaths. We were lucky that several years ago, the Wildlife Conservation Society–Tanzania Program had conducted the most detailed census of the species to date (Davenport et al., 2019). These data allowed us to map colobus groups that lived close enough to the road that they could have occasionally crossed it and contributed to the roadkill dataset. Combining the observations of roadkill with these detailed demographic records allowed us to address the question about the effect of collisions on the colobus numbers with some precision.




Left: A Zanzibar red colobus sprints across the main road: in the four years covered by our study one colobus approximate every six weeks on this road. Right: This is one of the very few places along the stretch of road that intersects Jozani-Chwaka Bay National Park where the Zanzibar red colobus can cross in relatively safety by jumping across from the tall trees. Elsewhere they need to walk on the ground.

Over the four-year study period (2016–2019), the Zanzibar red colobus was the most frequently recorded roadkill species (29 of 53 documented deaths). Approximately one colobus died every 6 weeks on the road. There were three times as many adult females in the roadkill dataset as there were adult males, but because these numbers reflect the composition of the groups of colobus (which have many more females than males), our analysis showed that all age–sex classes were equally likely to be killed on the road, given their availability in surrounding forests. We estimated that annual mortality as a result of vehicle collisions is 1.8–3.2%. This may not seem high but given this species has no major natural predators on this island, vehicles are probably the most substantial cause of mortality for these monkeys, other than old age.

Left: One of our study groups is crossing the road at a relatively leisurely pace. Right: Zanzibar Red Colobus

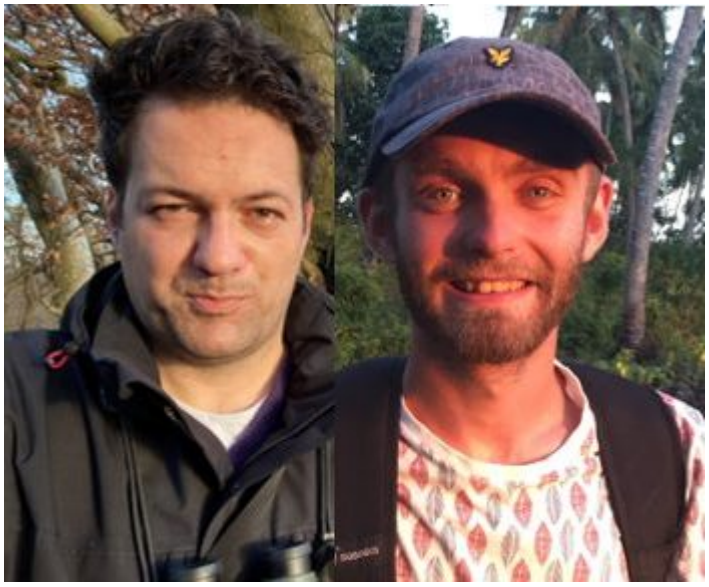
Project field assistant Mwinyi Abdalla signalling to oncoming vehicles to reduce their speed as a female colobus is slowly making her way across the road.

However, it used to be worse. Back in the early 1990s when this road was first covered with tarmac, allowing cars to travel faster, monkey deaths were even more common. One estimate suggests that a colobus was killed on this road every 2–3 weeks, accounting for 12–17% annual mortalities in the groups residing near the road (Struhsaker & Siex, 1998). After speed bumps were installed on this road in the late 1990s, colobus mortality was estimated to have declined by c. 80%. Some 20 years later our estimates of mortality for 2016–2019 are similar.

Speedbumps have clearly made a big difference. The colobus here travel on the ground often, so a speedbump is more likely to make a difference than an arboreal bridge over the road. Yet the four speedbumps only cover a small stretch of the road over which we documented roadkill incidents. There's clearly a potential to reduce colobus road death further near Jozani. What remains unknown is how many other locations across Unguja island have a similar problem and what the overall impact of roadkill is on this species.

All photos: Alexander Georgiev

The open access article The implications of vehicle collisions for the Endangered endemic Zanzibar red colobus *Piliocolobus kirkii* is available in *Oryx—The International Journal of Conservation.*




## Alexander V. Georgiev & Harry Olgun

Alexander Georgiev is a Lecturer in Primatology at Bangor University, UK. He has previously studied the reproductive ecology and physiology of chimpanzees, bonobos and rhesus macaques. He established the Zanzibar Red Colobus Project in 2018 and has been directing research on the conservation physiology and behavioural ecology of this species since. A central aim of this work is to understand how anthropogenic disturbance affects this forest-specialised primate—from the physiological to the

population and landscape level.

Harry Olgun is a PhD student at Bangor University, UK. He studied the road ecology of the Zanzibar red colobus for his MScRes degree. He will now extend his work on primate behaviour and ecology in anthropogenic landscapes to studying how forest loss and fragmentation across the species range affect the persistence of Zanzibar red colobus groups and populations. His research interests include conservation, primate behaviour, movement and feeding ecology.