

Promoting positive interactions with the traumatized elephants in Gorongosa National Park

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The elephants of Gorongosa National Park (NP), Mozambique, suffered extreme disruption during the country's 15-year civil war between 1977 and 1992. Elephants were shot and killed for meat and ivory by the forces of FRELIMO¹ and RENAMO² and large quantities of ivory were exported from the area. During this period, an estimated 90% of the elephant population was killed (Campbell-Staton et al. 2021; Poole and Granli 2022). More than a quarter of a century after the end of the war an enduring legacy among elephant families has been a culture of aggression towards vehicles (Poole et al. 2023 this issue).

The experience of the Gorongosa elephants is not unique. Wars, civil conflict, intense levels of ivory poaching, and heavy-handed management interventions (e.g. culling) have disrupted many populations of African savannah (*Loxodonta africana*) and forest (*L. cyclotis*) elephants (e.g. Beyers et al. 2011, Bouché et al. 2011; Thouless et al. 2016; Daskin and Pringle 2018). In some cases this has caused unusual levels of fearful and aggressive behaviour (Poole et al. 2023).

In 2011 we (Joyce Poole (JP) and Petter Granli (PG)) were invited to Gorongosa NP to

study the elephant population to better understand the lasting physical and behavioural scars inflicted by the war, and to provide scientific data to ensure its strategic protection, management and recovery (Poole and Granli 2022; Poole et al. 2023). In the year prior to the onset of our study, a tourist vehicle, driven by a guide, was overturned by an adult female. In the following two years, another three vehicles were tusked or head-butted by adult females (Poole et al. 2023). In 2013, in an attempt to reduce the frequency of attacks and habituate elephants to vehicles, Gorongosa NP management asked us to write a set of general guidelines for appropriate behaviour around this population of elephants. As the document was primarily intended for use by lay visitors to the Park, we wrote a list of simple instructions that did not require knowledge of elephant behaviour (Table 1).

Based on our long experience with elephants and knowledge of their behaviour, our own approach was different. Instead of remaining 100 meters away, we responded to the signals the elephants gave us. We observed the behaviour of the elephants as we approached them, stopped the vehicle, and turned off the engine at the first indication that they were concerned by our presence. Our intention by stopping the vehicle—even when we were charged—was to show the elephants that we understood and respected their signals and that we were not a threat. Once stationary, we resolved to remain calm and quiet, even when we were threatened or charged, in the knowledge that any noise might increase the elephants' agitation and that, if we drove off, we would encourage them

¹FRELIMO: Frente de Libertação de Moçambique/Liberation Front of Mozambique

²RENAMO: Resistência Nacional Moçambicana/Mozambican National Resistance

Table 1. 2013 guidelines prepared with Gorongosa NP management for self-drive visitors entering the Park

Gorongosa NP Elephant Guidelines for Game Drives

The elephants of Gorongosa are wild animals. They are not habituated to people nor to the approach of vehicles. Due to their particular history of persecution, they may respond to your presence with aggression. For your own safety and the well-being of the elephants, please be respectful of them. Each situation and possible interaction is different, but we ask you to take note of the following:

- Meeting elephants is not without risk; they are extremely powerful, intelligent animals and can easily crush your car.
- By entering the Park you accept responsibility for the risks involved, and their consequences.
- Elephants have the right of way; you are a guest in their habitat and home.
- The maximum speed in the park is 40 kph. You will be safer and see more if you drive more slowly.
- In open areas with good visibility do not approach elephants closer than 100 meters.
- In areas with tall grass and dense vegetation always reduce your speed and expect that you may meet elephants around the next curve.
- At times we may choose to close certain roads to reduce the risk of dangerous encounters.
- Use your observational skills. If elephants are agitated leave them alone or stay further away.
- Noise can frighten and provoke elephants; remain quiet in their presence.
- Note that an elephant can hear you coming from over a kilometre away, and that they may feel threatened if you are disrespectful of their boundaries by continuing to approach.
- If at all possible, avoid confrontations with elephants by keeping a safe distance.
- If you experience an aggressive encounter with elephants, we would like to hear about it. Please inform the reception or the Park administration.

**We want you to experience Gorongosa's beautiful elephants in a safe and positive way.
Help us to habituate them by being a responsible, respectful visitor.**

to chase us. Thus, we did not start the engine or make any kind of disturbance in the vehicle until the elephants departed.

Exceptions to our approach were: 1) instances when we were ambushed at high speed while we were driving, whereupon we continued to drive and, 2) when an elephant head-butted our vehicles (JP/PG and Jason Denlinger (JD), Dominique Gonçalves (DG)) we created commotion and drove away when it was possible. This method allowed us to gather data on how different types of groups (all-male versus family), different families, and individual elephants responded to vehicles (Poole et al. 2023).

In an effort to minimise variation in human behaviour around elephants, and due to concerns for visitor safety, the Park management took the

decision to close the Park to self-drive vehicles soon after we wrote the guidelines. Thus, the guidelines were never formally used by visitors to the Park as game-drives were, thereafter, led by a small number of experienced, long-term guides. Throughout our study, we collaborated closely with the guides, joining them on game drives, taking them with us to observe elephants, teaching them how we approached elephants and discussing elephant behaviour with them. Many of the guides collected data for us, recounted incidents and shared photographs or videos of elephants with us that were invaluable to our collective understanding of the Gorongosa population and individuals within it. Many of the scientists and the Park management team who regularly encountered elephants had evening meals together at the lodge dining room, where we shared and reflected on daily experiences. This social

context was ideal for building a communal understanding of the Gorongosa elephants.

Over the years, we collectively established a relatively uniform way of interacting with the elephants, which relied on the majority of us being able to read their signals and respond to them in a similar manner. Our culture, in a sense, was aimed at building a relationship with elephants within which they could depend on us to behave in a predictable and respectful way. We stopped the vehicle when elephants indicated that they were concerned, we remained quiet and calm in their presence, and we tried not to drive away when charged. Over time we learned that in Gorongosa NP, males could be approached relatively closely without causing them agitation while the response of families varied substantially depending on family tradition, the personality of individual adult females, and the location of their core area (Poole et al. 2023). Families who resided in areas that were inaccessible to vehicles displayed increased likelihood of responding with fear or aggression compared with those who frequently encountered vehicles. A few families could be approached to within 30 meters without any negative reaction, while others fled or charged at much greater distances.

Is there any indication that our interventions promoted more positive interactions between vehicles and Gorongosa's elephant families? After the closure of Gorongosa NP to self-drive vehicles in 2013, two years of renewed civil unrest in the surrounding area meant that elephants encountered relatively few visitors (Poole et al. 2023). As visitor numbers increased thereafter, tuskless adult females who had only rarely been observed, head-butted another three vehicles in 2016 and two in 2017 (Poole et al. 2023). In the six years since, there have been no further incidents. Through continued positive interventions by trained Park staff, physical attacks on vehicles since 2017 have ceased as far as the authors are aware. As we describe in Poole et al. (2023) there are other indications that the aggressive culture of the Gorongosa elephant families is slowly changing as they begin to learn from experience and from one another that vehicles are no longer a threat, though longer-term study is needed.

Aggressive elephants can pose challenges for conservation and management, potentially causing negative ramifications for human-elephant co-existence as well as for revenue streams from tourism. Furthermore, elephants who put considerable time into avoiding or attacking humans are using energy that could otherwise be spent on survival and reproduction (Brakes et al. 2021). Recognizing that the Gorongosa elephants' culture of aggression was caused by their traumatic history, and adapting management interventions to allay their fears, we believe we have helped this population towards recovery. While the process of building mutual trust is slow, continued consistent respectful interactions will positively impact Gorongosa's human-elephant relationship. The overall collective approach used in Gorongosa could provide a model for other traumatized elephant populations.

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