

Project Update: November 2023

Project Summary

Transport networks, in this instance roads, are critical elements of human economic development and society, and global rates of network construction will likely rise for the foreseeable future, particularly in Africa. As a result, over 30 development corridors of over 53 000 km length are planned for Africa, and these developments will traverse and reshape natural landscapes, which negatively impacts wildlife populations by causing lack of habitat connectivity and roadkill.

The TRAC N4 Toll Route passes through landscapes that comprise patches of grasslands, bushlands, freshwater ecosystems, and wetlands, which attract numerous wildlife in the vicinity of the road. Increased animal activity on, and adjacent to, the highway often results in increased wildlife-vehicle collisions (WVC, i.e., roadkill). Through the partnership work undertaken by the Endangered Wildlife Trust (EWT) and the TRANS AFRICAN CONCESSIONS (TRAC), roadkill occurrence data are regularly recorded by the route patrol teams. From the data collected, several sections along the TRAC N4 route are emerging as roadkill hotspot areas, requiring roadkill intervention measures to be proposed, trialled, assessed and adopted.

Aims

The South African Biodiversity Act of 2004 clearly mandates every province to develop a biodiversity plan that considers connectivity areas (Keeley et al. 2019). While this aligns well with the mandate of the sustainable development goals, there is still a vacuum in South Africa to develop an integrated policy framework for sustainable transport infrastructure. This means that a paradigm shift on transportation standards and planning for road infrastructure development is required in the sub-Saharan African countries.

Through a doctoral study we are researching the need for promoting sustainable transport infrastructure and we argue that sustainability standards for transportation planning should also incorporate guideline for restoring ecological connectivity to facilitate gene flow, climate adaptation, and reduce wildlife roadkill incidents. Part of our efforts include evaluating how useful existing road infrastructure is in helping animals to move across roads, so we can improve road safety for wildlife and all road users.

Objectives

Although road structures such as culverts, bridges, and viaducts were originally designed and constructed to create adequate drainage beneath highways and not for ecological connectivity, numerous species could potentially benefit from them (Forman et al. 2003; Beier et al. 2008; Collinson et al 2019). When appropriately modified, these structures could improve opportunities for animals to move across highways for migration, foraging or accessing important resources such as food and mating partners (Bhardwaj et al. 2020; Helldin, 2022). In this study, we attempt to investigate these aspects following the objectives listed below:

- A systematic review of global road ecology camera trap studies that have explored the use of wildlife crossings by animals in road-fragmented landscapes.

- An evaluation of national policies and frameworks promoting Sustainable Transport infrastructure in SA.
- Exploring the trends and patterns of wildlife roadkill on the TRAC N4 Toll Route (2017-2023).
- Exploring wildlife crossings effectively on the N4 Toll Route (TRAC N4).

Some of the project activities that are adopted in this study include:

Activity 1: Training of route patrollers

Existing staff, especially those conducting patrols receive ongoing training with support offered through a training workshop, practical and WhatsApp group (Figure 1). This is to ensure that all relevant employees of the TRAC are capacitated in terms of data collection protocols, species identification, and broader insight into the concept and importance of road ecology, annual training workshop is facilitated to the TRAC staff. In addition, the researcher has accompanied road patrol teams at least once per annum (waiting for TRAC to finalised logistics for 2022 training).

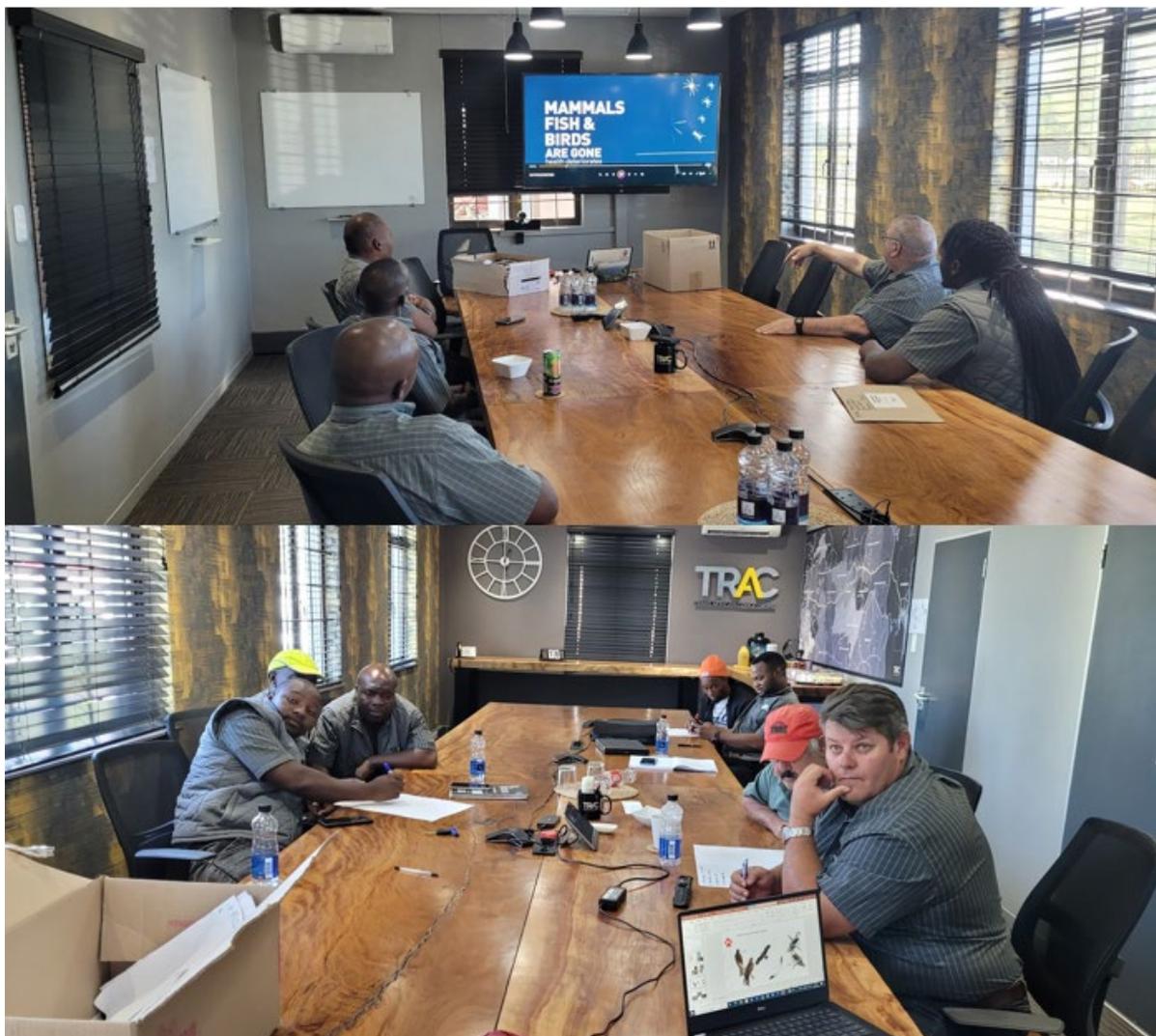


Figure 1: WhatsApp interactions between TRAC route patrollers and the researcher.

Activity 2: Monitoring existing road underpass crossing structures

The fieldwork for this project commenced in September 2022, and eight underpass structures were fitted with camera traps to monitor if wildlife is indeed utilising them to cross the highway safely. These cameras were deployed in road sections that have emerged as wildlife roadkill hotspots where roadkill-reduction measures are most urgently needed. Mesh fencing was installed to funnel animals to the closest underpass crossing (Figure 2).

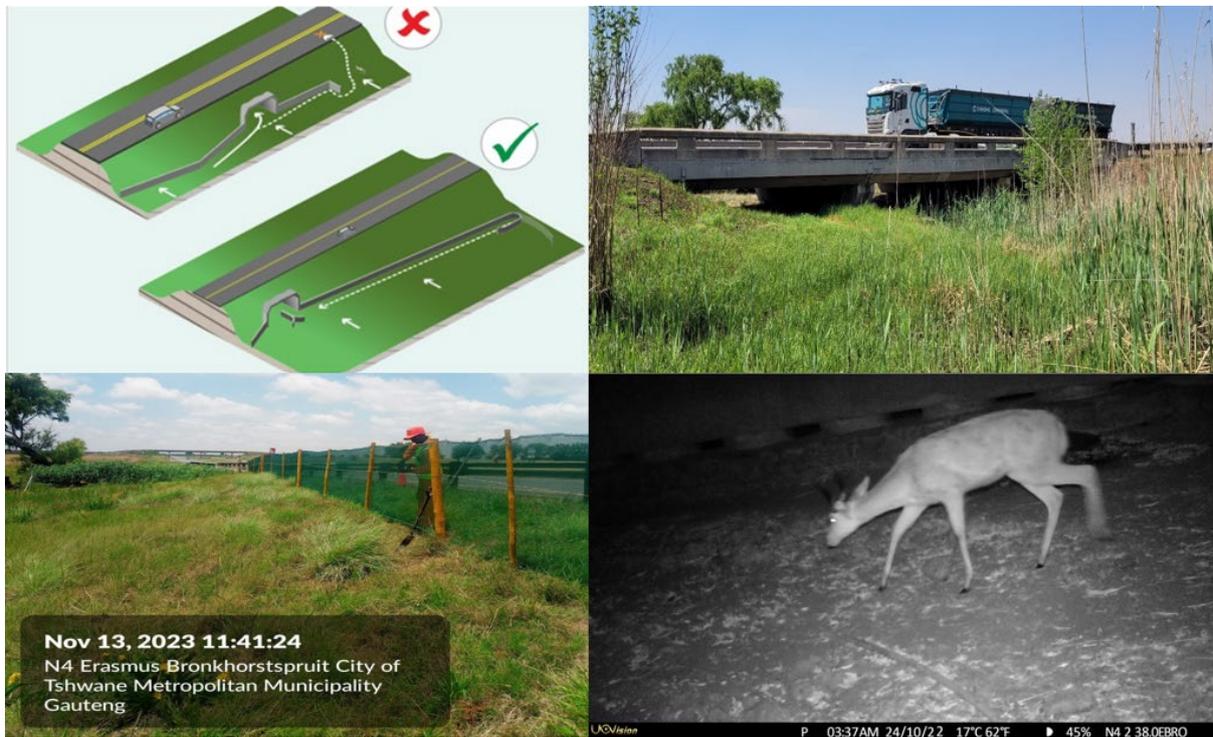


Figure 2: One of the underpasses crossing that is monitored through camera traps on the TRAC N4 Toll Route (Modified from Marcel Huijser/WTI).

Activity 3: Preliminary results presented in two academic conferences

The researcher has attended two academic conferences where he presented preliminary results of his work, African Conference for Linear Infrastructure and Ecology in Nairobi, Kenya and the Zoological Society of Southern Africa in KwaZulu-Natal.



Figure 3: Thabo at the African Conference for Linear Infrastructure and Ecology in Nairobi.

The first manuscript from this work has been submitted for peer-review in the Global Ecology and Conservation Journal, whilst the second manuscript is on its final stages of completion. In all the publications The Rufford Foundation is acknowledged. We are thankful for the funding support!!!