

BIODIVERSITY OBSERVATIONS
RESEARCH PAPER (MORTALITY AND DISTRIBUTION)

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Journal editor:
Pete Laver

Manuscript editor:
Pete Laver

Received: March 23, 2019; Accepted: December 24, 2019; Published: December 24, 2019

Citation: **Baxter-Gilbert J, and Riley JL. 2019. Leopard tortoise (*Stigmochelys pardalis*) road mortality and extralimital occurrence in Western Cape, South Africa.. Biodiversity Observations 10.12:1-4**

Journal: <https://journals.uct.ac.za/index.php/BO/>

Manuscript: <https://journals.uct.ac.za/index.php/BO/article/view/732>

PDF: <https://journals.uct.ac.za/index.php/BO/article/view/732/648>

HTML: <http://thebdi.org/blog/2019/12/24/leopard-tortoise-road-mortality>



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Leopard tortoise (*Stigmochelys pardalis*) road mortality and extralimital occurrence in Western Cape, South Africa.

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On 8 October 2018 at 16:10 h, while driving along the R364 Highway 6 km west of Lambert's Bay, Western Cape, South Africa (32.0978°S, 18.3267°E), we observed a deceased leopard tortoise (*Stigmochelys pardalis*) on the side of the road. The tortoise had been struck by a vehicle, with the carapace split along the spine and both bridges of the shell fractured (Fig. 1). The specimen we observed was a medium-sized female (straight-line plastron length of 310 mm and a reconstructed straight-line carapace length of approximately 390 mm). Tortoise and turtle road mortality is not uncommon, and is often cited as a major contributor to population declines for many species across the globe (Gibbs and Shriver 2002; Aresco 2005; Andrews *et al.* 2008). Yet, for the leopard tortoise, road mortality is considerably under-reported (but see Dean and Milton 2003). We later observed a second adult female leopard tortoise crossing a nearby dirt road 3 km west of Lambert's Bay (Fig. 2) on 13 November 2018 at 16:35 h. This individual was moved off the road in the direction it was travelling to prevent it suffering the same fate as the previous individual we observed.

A study assessing driver attitudes on animal-vehicle collisions in Northern Tanzania, found that drivers said they were least likely to hit leopard tortoises due to the perceived damage it could cause to their vehicles (Kioko *et al.* 2015), as they are one of the largest species of tortoise on the continent (Boycott and Bourquin 2000). However, as our observation notes, vehicle collisions with leopard tortoises do occur. The direct effect of road mortality has a high likelihood of effecting many African reptile populations, especially for long-lived species with low recruitment rates that are negatively impacted over the long-term by small increases in adult mortality (e.g., turtles and tortoises, Gibbs and Shriver 2002; Keevil *et al.* 2018). There may also be indirect impacts of roads on leopard tortoises. For example, poaching rates may be increased by tortoises' proclivity for crossing roads, with some drivers reporting they would remove live tortoises from the roads to take home or to sell (Kioko *et al.* 2015). Also, it is known that the opportunity roads present for foraging may actually increase predator population size which can, in turn, negatively impact tortoise population size due to increased predation pressure (Loehr 2017). Thus, African tortoise populations are likely directly and indirectly threatened by roads and it remains uncertain whether certain tortoise species can sustain their populations into the future as road networks increase in density.

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Received: March 23, 2019; **Accepted:** December 24, 2019; **Published:** December 24, 2019

Recommended citation: Baxter-Gilbert J, and Riley JL. 2019. Leopard tortoise (*Stigmochelys pardalis*) road mortality and extralimital occurrence in Western Cape, South Africa.. *Biodiversity Observations* 10.12:1-4

Manuscript subject: Mortality and Distribution



Figure 1: Figure 1. A medium-sized adult, female leopard tortoise (*Stigmochelys pardalis*) found dead on the road near Lambert's Bay, Western Cape, South Africa.



Figure 2: Figure 2. A live adult female leopard tortoise (*Stigmochelys pardalis*) removed from a dirt road near Lambert's Bay, Western Cape, South Africa; well outside of the species presumed native range.

Interestingly, both of our observations of leopard tortoises on roads are well outside the species' presumed native range in the Western Cape, which ends at the Breede River (180 km to the east of these observations), and over 200 km north of the identified introduced range (Hofmeyr and Baard 2014). It is important to note, this species is a popular pet, with escapes common, however specimens have been captured free roaming within their introduced range for the last 200 years (Hofmeyr and Baard 2014). Due to the lack of consensus as to the specific boundary line between where this species is native and where it is a domestic invasive, these observations should secondarily serve as a prompt for research into the genetic structure of leopard tortoises across their range, particularly while the species is considered widespread, common, and of low conservation concern (Hofmeyr and Baard 2014).

Acknowledgments

We would like to thank Dr. Michael Cherry for supporting the fieldtrips on which these observations were made. JBG is supported by a Centre for Invasion Biology Postdoctoral Fellowship at Stellenbosch University and JLR is supported by a Claude Leon Foundation Postdoctoral Fellowship also at Stellenbosch University.

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