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Juvenile Leopard Tortoise (*Stigmochelys pardalis*)
From Atherstone National Park
Photo: M.Vamberger

For tortoise, terrapin and turtle care and conservation.

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CONSERVATION NEWS

News on conservation genetics of the leopard tortoise (*Stigmochelys pardalis*) in South Africa

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Leopard tortoises are listed as Least Concern on the IUCN Red List (Baker *et al.* 2022) and on the South African Regional Red List (Hofmeyr & Baard 2017). They are believed to be abundant in Africa with large home ranges. However, the leopard tortoise (Fig. 1 & 2) is a protected species in some of the provinces of South Africa such as KwaZulu-Natal and Gauteng. Therefore, a permit or licence is required for certain activities such as the capturing, possessing, keeping in captivity, retaining, importing, exporting or killing of a leopard tortoise. Members of public may illegally collect tortoises from the wild or buy them from roadside vendors, sometimes transporting them considerable distances and across provincial boundaries in the process. Tortoises seized during enforcement activities or kept or found by members of the public may be dropped off at zoos and rehabilitation facilities, resulting in accumulations of tortoises of unknown origin at these centres. Sometimes unwanted tortoises in the possession of the public or tortoises from a centre have been released into the environment with little or no concern as to whether the tortoises would survive there or how the releases might affect wild populations. Work is currently underway towards a scientifically sound and informed tortoise release protocol. A crucial part of this process is the development and implementation of conservation genetics tools to inform releases to the wild and captive breeding if required.

The purpose of our study supported by the British Chelonian Group and the Deutsche Gesellschaft für Herpetologie und Terrarienkunde (DGHT) in 2019-2020 was to complete the existing dataset of Spitzweg *et al.* (2019), and to achieve the required coverage by closing some sampling gaps in northern South Africa to deliver the essential genetic baseline map needed to develop appropriate guidelines for the conservation release and relocation of leopard tortoises in South Africa. We published the results (Dajčman *et al.* 2021), and five distinct clusters in southern Africa could be identified, one more than previously thought by Spitzweg *et al.* (2019). One cluster is present in the south of South Africa with a mountain range as barrier to the north and four clusters in the north: one in Namibia, another one in northern central South Africa, a third one in central South Africa and a small one in north-eastern South Africa and southern Mozambique. Since the last publication,

two provinces initiated a process to collect DNA samples from captive leopard tortoises to determine origin using the dataset that was developed by Spitzweg *et al.* (2019) and Dajčman *et al.* (2021). Furthermore, additional DNA samples from wild leopard tortoises from protected areas in KwaZulu-Natal have been collected and some already sequenced. With this comprehensive research conducted, the authorities are now able to use the data and results as strong support for decision-making and to follow conservation principles by applying the DNA results to return tortoises to their geographical areas of origin. Fruitful collaborations are now established between Prof. Dr. Antoinette Kotze and Sonia Kropff from the South African National Biodiversity Institute (SANBI), Rynette Coetzee from the Gauteng Department of Agriculture and Rural Development (GDARD) and Dr. Adrian Armstrong from the Biodiversity Research & Assessment Division, Ezemvelo KZN Wildlife and Dr. Melita Vamberger from the Senckenberg Natural History Collections Dresden. The first implementation of origin determination using the research dataset was successful for a total of 72 tortoises from the National Zoological Garden, Pretoria and 50 tortoises from FreeMe Wildlife (https://www.freemewildlife.org/). Use of DNA results to identify genetically pure individuals suitable for release will continue as well as the identification of hybrid tortoises.

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Dajčman, U., Hofmeyr, M.D., Ribeiro Anunciação, P., Ihlow, F. & M. Vamberger (2021): Tortoise forensics: conservation genetics of the leopard tortoise *Stigmochelys pardalis* (Bell, 1828) in southern Africa. Salamandra, 57(1): 139-145.

Hofmeyr, M. & Baard, E. 2017. *Stigmochelys pardalis* Charles Bell, 1828. South African Biodiversity Institute. http://speciesstatus.sanbi.org/assessment/last-assessment/2684/. Downloaded on 16 September 2022.

Spitzweg, C., Hofmeyr, M.D., Fritz, U. & M. Vamberger (2019): Leopard tortoises in southern Africa have greater genetic diversity in the north than in the south (Testudinidae). Zoologica Scripta, 48: 57-68.

Figure 1: Juvenile leopard tortoise (Stigmochelys pardalis) from Atherstone National Park (Photo by M. Vamberger).

Figure 2: Adult female leopard tortoise (Stigmochelys pardalis) from Ophathe Game Reserve (Photo by A. Armstrong).