

Secretarybirds & Climate Change Doctoral Study

Season 1 Report

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Secretarybird nestlings on Toren Farm. Photo: Nick Smuts.



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INTRODUCTION

Greetings! You are receiving this newsletter because of your involvement in the conservation of the iconic Secretarybird in South Africa. This project is my doctoral research undertaking, designed in collaboration with BirdLife South Africa (BLSA) and the Hot Birds Research Project (HBRP). I am supervised by Prof Andrew McKechnie (University of Pretoria), Associate Prof Susie Cunningham (University of Cape Town), Dr. Melissa Whitecross and Dr. Christiaan Brink (both formerly of BirdLife South Africa). With their guidance I am investigating the potential impact of climate change on the persistence of Secretarybirds in arid parts of their range – a climatic envelope they have historically enjoyed but that may become too hot to handle in the future.

The motivation for this work includes a number of factors. First, Secretarybirds have a breeding and foraging ecology that exposes them to high environmental temperatures. Predicting the impacts of climate change for such birds requires understanding the physiological and behavioural mechanisms they employ to tolerate such temperatures. Second, several studies in the 21st Century have shown severe declines in Secretarybird numbers across their range. This has been caused by a variety of threats, including collisions with linear infrastructure and loss of habitat. These are fairly tangible factors that conservation organisations are designing strategies to tackle. More insidious, however, is the looming threat of climate change. As global temperatures rise and heat waves become more frequent, research groups such as the HBRP have shown that many bird species will be adversely affected by these changes, particularly in arid regions. This work has largely focused on passerine birds, up to the size of yellow-billed hornbills, but the risk to species such as large ground birds and raptors is still relatively unknown. Finally, the Secretarybird is, of course, a flagship species for biodiversity in South Africa, even featuring on our coat of arms. Our efforts to protect these fantastic beasts must consider all of the varying threats ranged against them.

STUDY SITE

One of the main aims of the project is to assess Secretarybird breeding ecology in arid environments, and so the southern reaches of the Kalahari Desert was identified as the initial study site, in keeping with much of the work of the HBRP. Where things would be a bit different, however, was that I intended to work in the Kgalagadi Transfrontier Park, a known “hotspot” for Secretarybirds. So it was that in June of 2023 I set out with Cassie Carstens from BLSA on a recce of the southern Kalahari, including the world-renowned Kgalagadi Transfrontier Park. We followed up on a number of nest sites, of which two or three looked in reasonably good condition, but none were actively in use. In fact, we didn't see a single Secretarybird. The desert was deserted.

During the months that followed, Eric Hermann kept me updated on a couple of surveys conducted by the Endangered Wildlife Trust. Disappointingly, the number of Secretarybirds in the park remained extremely low, as was the case with several other large raptor species. With the year rapidly running out, I realized I needed to go to Plan B. It was decided to shift the study site to the Calvinia area, in the southern reaches of the Northern Cape. Here, Francois van der Merwe, a lifelong *voëlkenner*, conservationist and Secretarybird aficionado, had been monitoring the local Secretarybird population for many years. He was optimistic that a sufficient number of breeding pairs were available for study, although warned that we were quite far into the breeding season

already. A further recce by Cassie and I confirmed three active nests, including one with a female incubating eggs, and this was enough to motivate an attempt to salvage some fieldwork for the season.



Cassie Carstens (right) and Francois van der Merwe observe a nest site on Toren Farm north of Calvinia.

FIELDWORK

Season 1 fieldwork took place from 29 November to 22 December 2023, with a short follow up mission from 11-14 Jan in 2024. We were hosted by the wonderfully hospitable Frances and Nico de Kok at the eco-centre on Platberg Farm, just outside Calvinia. I was fortunate to have a very capable and tech-savvy field assistant in Nick Smuts, and during the time in the Northern Cape we were also visited by no fewer than three of my supervisors, who all brought their different skills to the table and helped steer my course in the right direction. The initial focus was on two nests, west and north of Calvinia respectively. The nestlings in the third active nest that Cassie and I had identified during our recce had fledged by the time that I arrived for the fieldwork proper, and so didn't form part of the nest monitoring or chick tagging. But by a stroke of very good fortune during the follow up trip in January, we were alerted to the presence of an active nest on a farm west of Loeriesfontein, where two large nestlings were present, boosting our nest sample size back up to three. The details of our fieldwork at each nest are described in the following sections.

Driefontein

The first and “primary” nest was the one on Driefontein, a farm that neighboured Platberg where we were based and formed part of Francois’ farming conservancy. Here a pair of Secretarybirds was raising a single chick which was only about 2-3 weeks old when we arrived at the beginning of December. This site proved to be invaluable in terms of honing some of the field techniques of the project. Our first tasks included setting up a weather station nearby as well as a camera trap at the nest to start monitoring the behavior. The camera turned out to be very well positioned and almost immediately began recording fascinating footage of the adult birds bringing food and water to the chick (who we nicknamed “Han Solo” given its lack of siblings) and even providing it with shade on very hot days. You can see a clip over on BirdLife South Africa’s Facebook page, which has proved to be very popular! Follow this link to watch eh video: <https://fb.watch/quKWhWLSWe/>

With the help of my supervisor Susie Cunningham and a vet from Cape Town, Dr Anneke van den Bosch, we also took morphological measurements and a blood sample, as well as inserting a tiny microchip PIT tag between the bird’s shoulder blades, in order to begin working on a method to effectively record body temperature data.

Finally, on the return visit with one of my other supervisors, Melissa Whitecross, we fitted Solo with a GPS tracker. After receiving the results of the blood sample analysis conducted by SANBI in Pretoria, it was determined that this individual was, in fact, a female and we quickly renamed her “Hana” Solo. By now Hana will have fledged but will still be keeping fairly close to the nest site. We look forward to her maiden voyage into the wide world, when the GPs tracker should start delivering track data, as it relies on cellphone signal that is absent at the nest site.



Left: setting up a camera trap at the Driefontein nest site with Frances De Kok. Right: returning Hana Solo to the nest with Nico De Kok after a successful tagging procedure. Photos: Nick Smuts

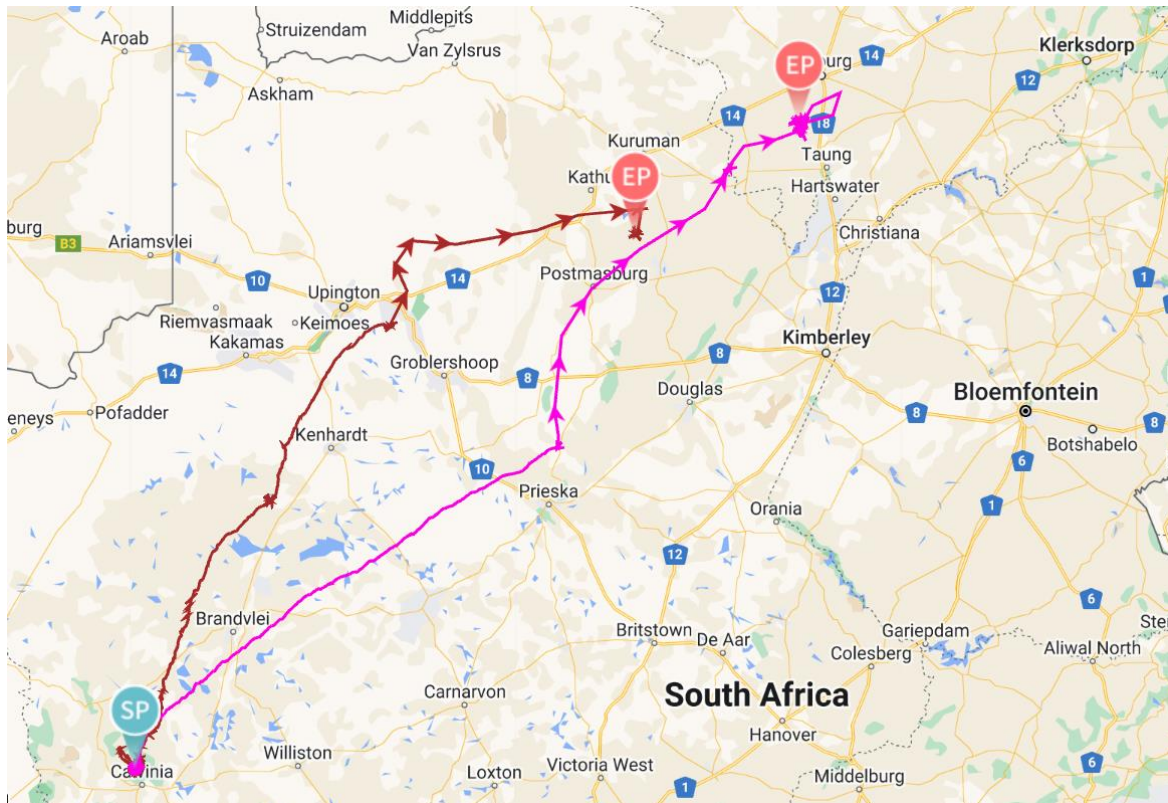
Toren

The second nest in the area was located on Toren, a farm owned by the Hugo family, and held three larger chicks about 6-7 weeks old at the start of December. Andre Hugo generously allowed us to visit this nest as often as we needed to and set up a camera trap to monitor these older birds (you can see a video of the nestlings fighting over a rat here: <https://fb.watch/quLa21UO9N/>). We conducted fieldwork at this site during both Susie's and Melissa's visits, measuring and taking blood samples from all three nestlings, and fitting tracking devices to two of them. After lab analysis of the blood samples, these birds proved to be two females and one male. Murphy's Law came into play as the little male was the only one not to receive a device. I nicknamed one Mikasa and Andre's family came up with the name Jewel for the other.



Tagging one of the Toren nestlings under the tutelage of Dr Melissa Whitecross. Photo: Nick Smuts.

Excitingly, both birds have left their natal area and their trackers have started picking up cellphone signal and transmitting track data (see map). Mikasa departed on 8 Feb and by 11 Feb had made it all the way to an area south of Vryburg, a straight line distance of 650km, in three days! She has been foraging in this area since then. Jewel was a little slower to get going, leaving the natal area on the 21st of Feb, but remarkably she headed in a very similar direction to her sister. By the 24th of Feb she had settled in an area between Postmasburg and Kuruman. We look forward to monitoring both these birds' movements going forward.



The first post-fledging journeys undertaken by Mikasa & Jewel from the Toren nest. Mikasa travelled from Calvinia up to Vryburg between 8 and 11 February (pink), while Jewel traveled up to Kathu between 21 and 24 Feb (brown).

Graafwater

The final nest we were able to work on came about quite unexpectedly. A few days before Melissa and I were to make the follow-up trip to the Calvinia area in January, I received a message from Francois saying that he had received news of an active nest on a farm near Loeriesfontein. The photos provided by the farmer, Ewie Louw, suggested that the nestlings were a prime age for tagging, and he was more than happy for us to visit the site and see for ourselves. In the end we were able to tag and measure two healthy Secretarybird nestlings, who both turned out to also be females. Ewie and his family nicknamed one of them Kibusko, after the highest peak in the area, and I gave the other the nickname Sasha.



Kibusko of the Loeriesfontein nest

OTHER PROJECT HIGHLIGHTS

In early December I had the chance to engage with several groups of school learners who visited the Platberg Eco Centre as part of the outdoor education program run by Frances De Kok. This was a great opportunity to talk about the Secretarybird project and conservation in general with the youth of the local community. In January, a group of learners and students who are part of the Karoo Youth program (Karoo Jeugstiging) also visited the centre and were able to join us for the tagging session of Hana Solo. This was a highlight for all involved.



Karoo Jeugstiging learners get a briefing before the tagging of Hana the Secretarybird. Photo: Nick Smuts.

Platberg also had a visit from a collaborative group from World Wildlife Fund and Nature Connect, a conservation NGO based in Cape Town. This was a good networking opportunity including a presentation on the Secretarybird project from my side, a nature walk and a braai.

It would be remiss not to mention life in the Karoo as a highlight. From the big skies, mountains and trails to the friendly people, farm animals and birdlife. We also got to sample the local hotspots of Calvinia, with Ciela's Pub & Grill and Morris Cafe being two of the favourites!

GOING FORWARD

The rest of the first half of the year will be concerned with analyzing existing data and working on chapter write-ups, as well as preparing for a trip to Dullstroom to work with the captive birds at the Dullstroom Raptor and Rehabilitation Centre. This will be aimed at assessing the thermoregulatory and metabolic responses of this species to different temperature sin a controlled environment.

The data from the GPS tagged birds will continue to accumulate and this will be combined with data from previous birds tracked by BirdLife South Africa in order to assess whether there is a notable effect of temperature on Secretarybird movement and behavior. Video footage from the nest sites also needs to be categorized to look at the effects of temperature on adult and nestling behavior under high heat loads. We will share highlights from these camera traps on BirdLife South Africa's social media platforms.

I would like to thank a number of people for supporting this work so far. To Laetitia Steynburg for the sponsorship of the tracking devices; Frances and Nico De Kok for hosting Nick and myself at Platberg and generally being there for any needs we might have; my supervisors for sharing their knowledge and skills and taking the time to visit me in the field; Francois van der Merwe for general support, enthusiasm and helping me to integrate into the community; Nick Smuts for assistance in the field and technical skills in the office; Cassie Carstens for leading the reces and designing the camera trap tower. I aim to continue the progress of this work towards understanding these fascinating birds and figuring out how better to conserve them.



A nestling at the Toren nest site keeps its eye on something overhead.