FitzPatrick Institute of African Ornithology

UNIVERSITY OF CAPE TOWN
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APNR Southern Ground-Hornbill Research & Conservation Project

QUARTERLY REPORT

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ABOUT US

The APNR Southern Ground-Hornbill Project is dedicated to the research and conservation of Southern Ground-Hornbills in the Greater Kruger region of South Africa. Researchers from the FitzPatrick Institute of African Ornithology, UCT, have been at the forefront of critical research that informs conservation efforts by understanding the habitat use, reproductive success, and behaviour of these iconic birds. The project installs and monitors artificial nests which are vital to enhance their breeding success and allows for comprehensive studies of the birds in their natural environment.

Photo: Reto Güttinger

PLANS FOR UPCOMING BREEDING SEASON

During this time of year, the birds are not breeding and their territories expand, making them challenging to locate. This period provides us with a valuable opportunity to analyse data, review camera trap footage, and write and prepare materials for publication. However, this period passes quickly and we soon begin to shift our focus towards the upcoming breeding season.

From August to September, we will start the installation of new nest boxes to replace those that are unlikely to survive another season, as well as conduct repairs on any existing nests that need attention. Following this preparation, we will enter another busy breeding season, marked by monitoring nests and conducting vital research.

Exciting new research ideas are coming to focus, and we are busy trailing new tracking devices which we hope to be able to implement on chicks prior to fledging this coming season.

NESTS TO REPLACE:
(GROUP OR PROPERTY NAME):

Caroline (Timbavati)
Copenhagen (Klaserie)
Masungulo (Timbavati)
N'tsiri (Umbabat)
Lornay (Timbavati)

Figure 1. N'tsiri nest, installed in 2013 is now due for replacement.

NESTS AND POPULATION GROWTH OVER 24 YEARS

When the project began in 2000, natural nests for ground-hornbills, in the form of large natural tree cavities, were in short supply in the APNR. The growth of the ground hornbill population in the APNR is due to the successful uptake of artificial nest boxes, which were implemented as a conservation tool.

To facilitate groups large territory sizes, (approx. 100 square km) nest boxes are spaced at least 5 - 10 km apart to minimise group conflicts. The density of nests in the APNR will therefore not increase, but be maintained, replacing nests when needed. In recent years there has been a slight increase in the number of nest boxes due to the increased area in which the project works (notably Balule PNR; Fig.2). This has allowed the population to expand and the birds are now being seen more frequently in areas where they were previously rare.

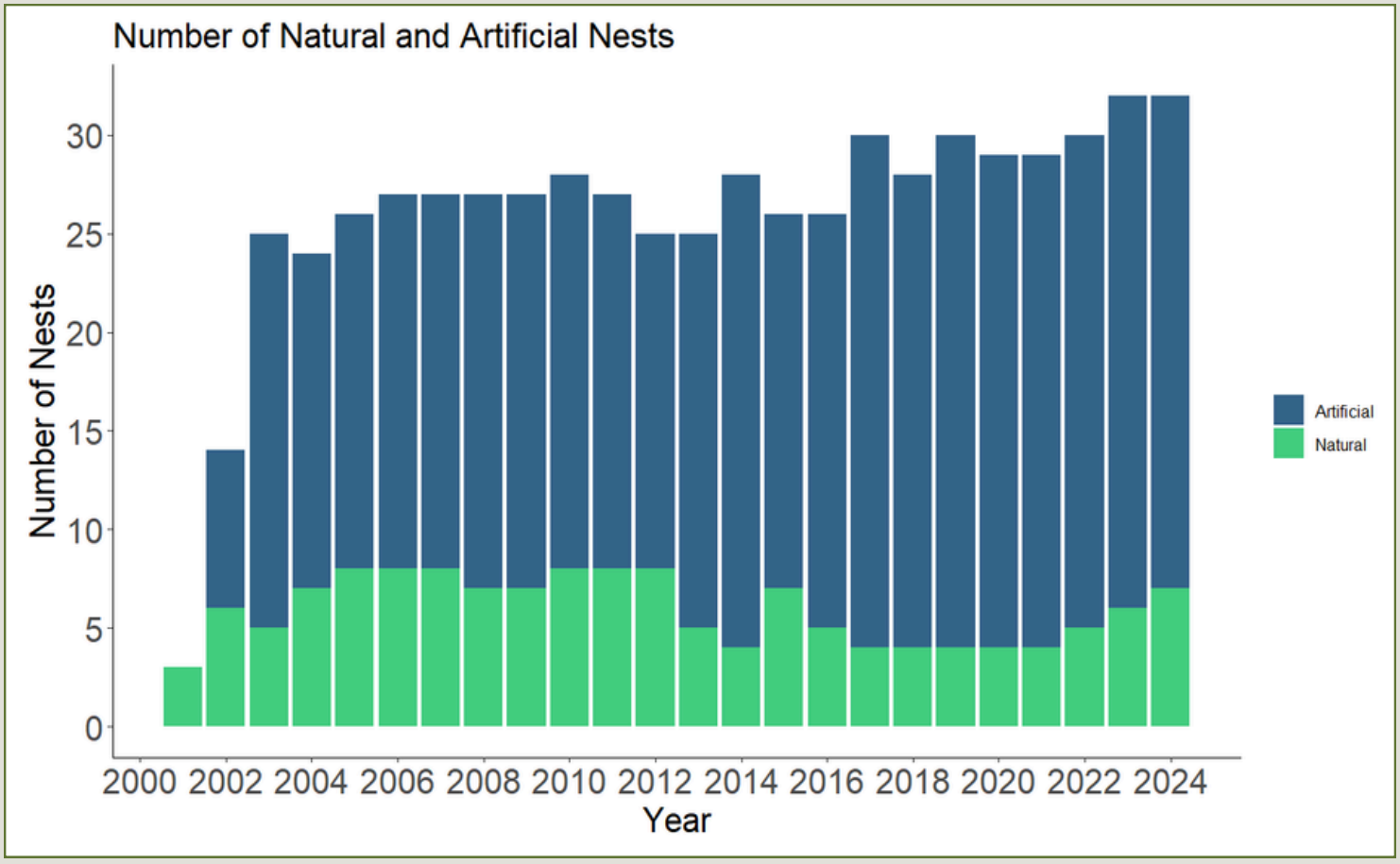

Figure 2. Plot showing the number of nests monitored by the project in the APNR from 2000 to 2024. Natural nest numbers are shown in green and artificial nests in blue.

You can read more about a study on artificial nests and the breeding success and population growth of ground-hornbills in the APNR here: Carstens (2017) Breeding and dispersal implications for the conservation of the Southern Ground Hornbill Bucorvus leadbeateri

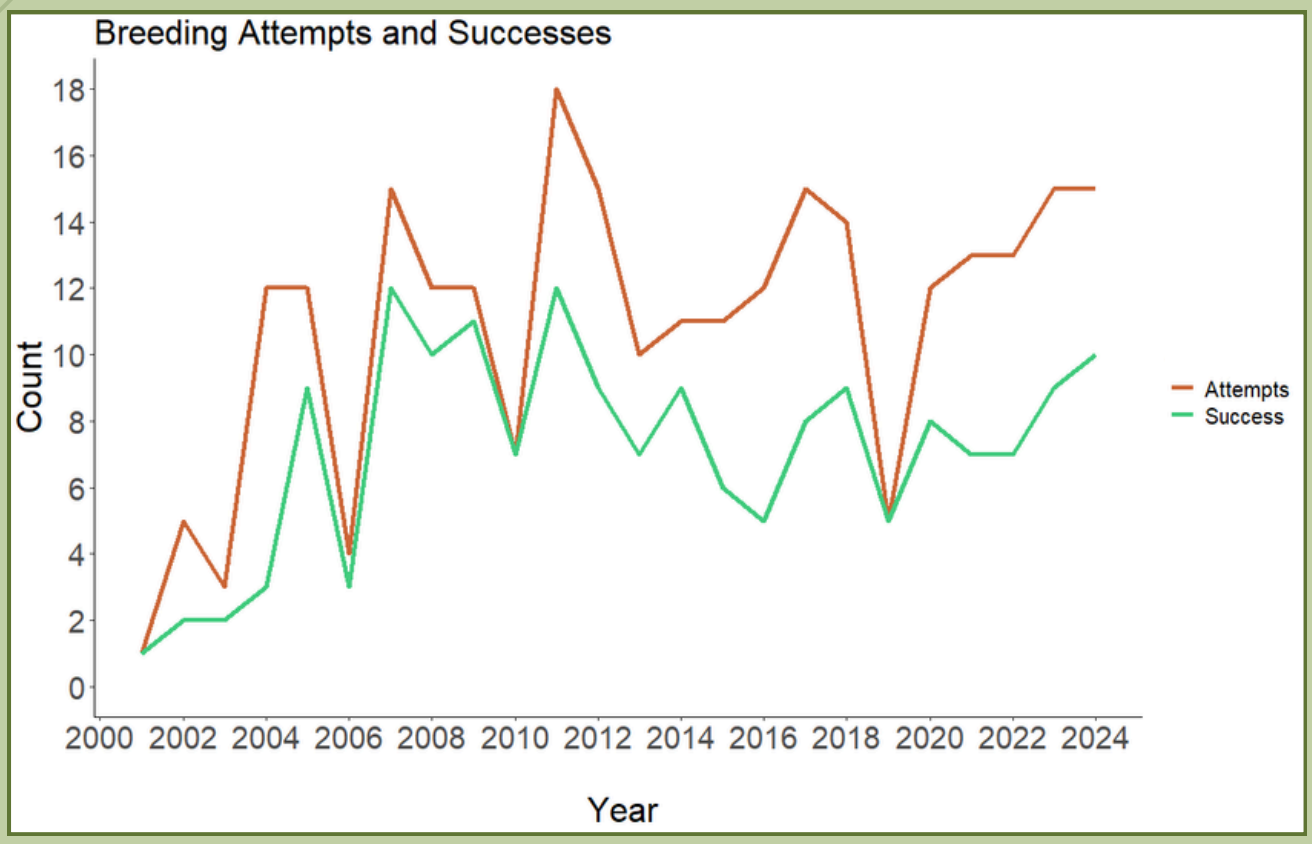

Figure 3. Breeding attempts and successes from 2000 to 2024 in APNR. The red line shows the number of breeding attempts and the green line shows successful attempts (where chick fledges from nest).

The number of breeding attempts and successes (where chicks successfully fledge from nest) increased following the installation of nest boxes, subsequently declined, and is now showing a recent upward trend (Fig. 3). Since 2000, a total of 173 chicks have fledged, 30 from natural nests and 143 from artificial nests. Productivity can be influenced by various factors, including food availability, social conflicts, predation, and climate. Notably, during the 2018/2019 breeding season, the region was in the tail-end of a severe drought, which resulted in only five groups attempting to breed, all of which were the most experienced and successful breeding groups. In recent years, however, breeding attempts have risen once again, likely due to improved rainfall conditions. This highlights the importance of our long-term study in gaining insights into these trends and their underlying causes.

Figure 4. Newly hatched chick (left) and chick almost ready to fledge (right)

The number of groups and individual birds has increased across all APNR reserves (Fig.5). Historical data from 2004, following several years of monitoring, provides a baseline. Notably, Balule has experienced the greatest increase in both group and individual numbers; however, it is crucial to interpret this data with caution due to the limited historical information available for this reserve.

The average group size across the reserves ranges from 3 to 4 individuals and we estimate the population size to be between 150 - 170 birds. In Timbavati, we are witnessing the emergence of new groups, typically consisting of 2 to 3 birds, likely resulting from the dispersal of individuals from existing groups. In Klaserie, territories tend to be larger, and we are currently observing a rise in the number of individuals per group rather than an increase in the overall number of groups. In Umbabat, improved reproductive success among groups has contributed to a higher number of individuals per group. Thornybush has only one actively breeding group; however, it is important to note that groups from Timbavati have territories that overlap with this reserve. We have installed a new nest in southern Thornybush with the aim of facilitating the expansion of the birds range.

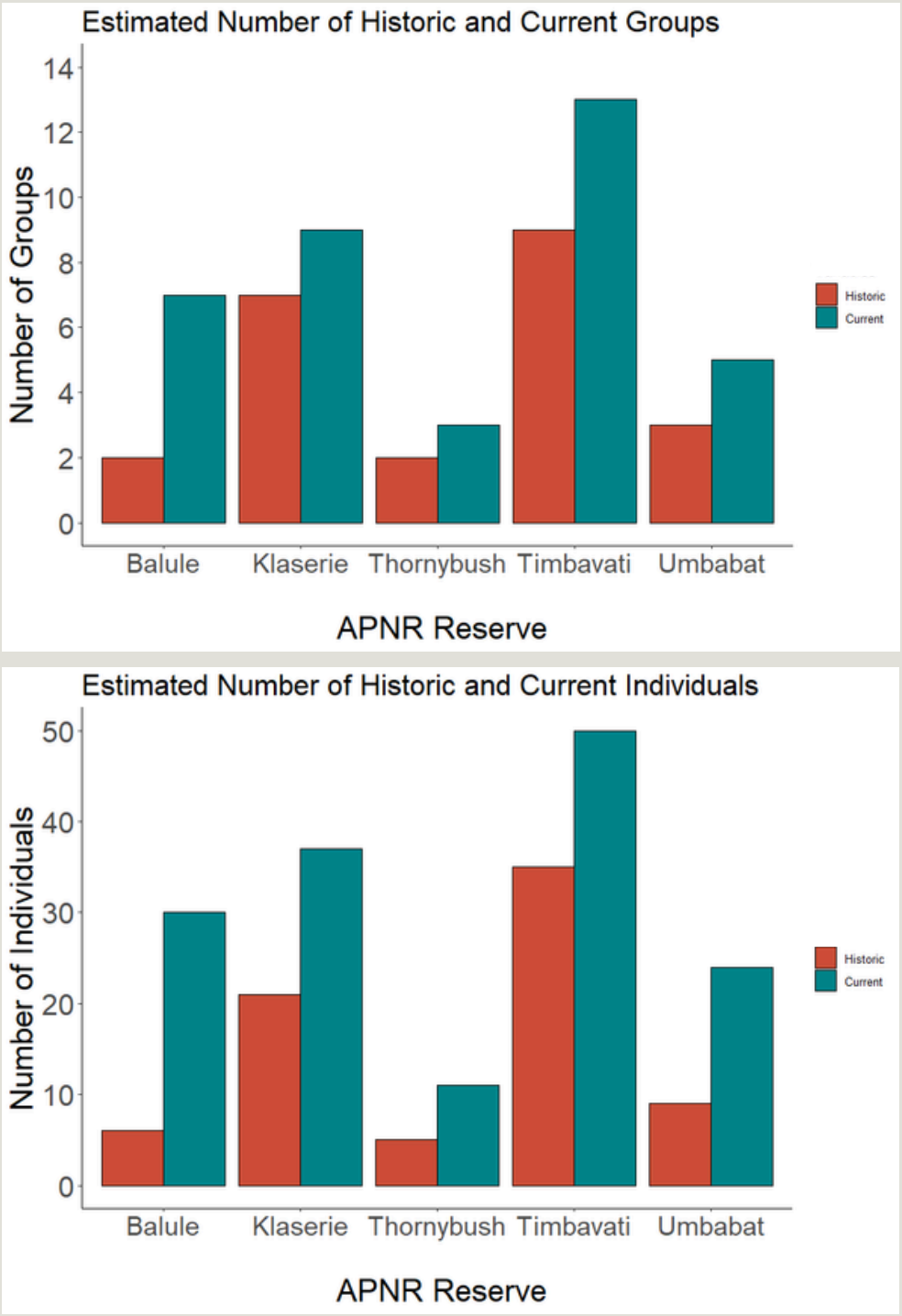

Figure 5. Top: Estimated number of historic (red) and current (green) groups in each reserve. **Bottom**: Estimated number of historic (red) and current (green) individuals in each reserve.

RESEARCH

As part of Kyle's PhD research, it was found that each individual female ground-hornbill produces unique territorial vocalizations. Since then, collaborators Dr. Fanny Rybak and student Samuel Meillier from the University of Paris-Saclay have continued to analyse the recordings collected from the nesting sites.

Specific attention was paid to the provisioning (feeding) calls produced by male birds when they arrive at the nest to feed the incubating female or chick. Samuel investigated whether these calls are also unique to individuals and whether they change according to the type of prey being provided.

His results revealed that, similar to female territorial vocalizations, male provisioning calls are unique to each individual and can be used for recognition between individuals. Fascinatingly, he found that the provisioning calls differ based on whether the males bring vertebrate or invertebrate prey to the nest (Fig. 6). This suggests that males are conveying information about their contributions. Notably, this type of variation in provisioning vocalisations has, as far as we know, only been recorded in highly intelligent species, including common bottlenose dolphins, common ravens, and some primates.

Overall, these results highlight the complexity and importance of vocalisations and communication in the group dynamics of southern ground-hornbills.

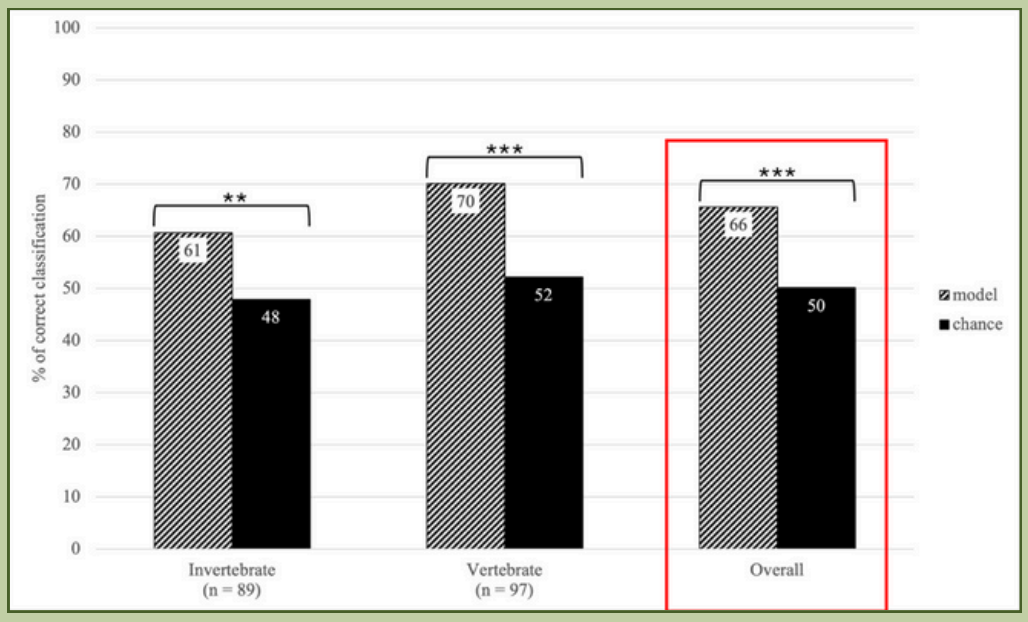

Figure 6. Model classifications of calls correctly identified to prey type in comparison to what is expected by chance. The model classified each call to the correct prey type 66% of the time.

Figure 7. Male provisioning invertebrate prey (left) and vertebrate prey (scrub hare) (right) to chick in nest. Ground-hornbills produce a soft "feeding" call when provisioning.

GROUP DYNAMICS

In our last report, we noted that we provided supplementary food and lice treatment to a chick on York PNR (Balule PNR) to support its fledging process. We were concerned about the adult female, who had sustained an injury that likely limited her (and the groups) ability to attend to the nest adequately. Although the chick did fledge, we have not observed it with the group since then, leading us to believe that it may not have survived. The last sighting of the injured female was in May, when her condition was still serious.

Recently, our latest observation captured on Africam's live camera (Fig.8) showed that the injured female was absent from the group, which now consists of a 2-year-old juvenile, a sub-adult, and an adult male. Instead, a new female has joined them. This new female has been sighted on Olifants West for the past two years, primarily alone, and was even seen attempting to feed her reflection at a homeowner's window. We are pleased to see this lonely female has potentially integrated into the York group, especially given the situation with the injured female, who may have died or been displaced.

This discovery offers intriguing insights into the group's dynamics, and we will continue to monitor the situation. We encourage anyone who spots the group (and any others) to share their sightings with us.

Figure 8. York group, with new female in background, playing with the remains of a yellow-billed hornbill. Footage captured on Africams live camera on Balule PNR.

HOW TO HELP

We have set up WhatsApp groups for members of the APNR (guides, wardens, mangers etc.) to log sightings of ground-hornbills. This is an effective way to gather information on group movements and we encourage anyone who is interested in joining an already established WhatsApp group or would like to set one up for their area to get in touch with us. Alternatively you can email sightings to: **nghututu@gmail.com**

FUNDING

Please get in touch if you would like to donate to the project. Funding for ecology and conservation research is becoming increasingly hard to obtain, even as the critical need for these activities increases. This means that every donation to our research and conservation project is enormously welcomed and makes a positive impact on the conservation of the species.

R7000 can pay for a new artificial nest box + materials for repairing already installed nests.

R4500 can pay for a new camera trap, R200 can pay for a pack of batteries to power camera traps.

R450 can pay for a colour ring to ID an individual

R1700 can pay for a tank of fuel for us to carry out nest checks

R380 will pay for sampling equipment (needles, syringes, tubes, gloves) used on each juvenile before fledging.

ACKNOWLEDGMENTS

We thank the landowners and wardens of the APNR for their continued support and permission to research the ground-hornbill groups on their properties.

Thanks to John Solomon & Caroline Buckway, Wild Wonderful World, The Rufford Foundation, The Timothy Hancock Charitable Trust, Marc Solomon, Iron Man 4x4 Africa, Mary Oppenheimer & Daughters Foundation, Alan Whyte, Peter Janovsky, Clive Coetzee, Bateleurs Nest, African Born Safaris, BHS Safari Company, Wild in Africa, & Blue Sky Society, for their generous donations and funding which supports the continuation of this long-term project.

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Thanks to Timbavati, Klaserie, N'tsiri, Tanda Tula Safari Camp, Ndlopfu, and Peter Smelting for their ongoing support in fuel donations.

Thanks to the Mabula Ground Hornbill Project for support and assistance and to Kyle Brand from TUT, and JJ's Bones Of The Earth for designing and constructing artificial research nests. Thanks to all APNR members and staff who have been of great help, both logistically and by reporting ground-hornbill sightings.

APNR
GROUND HORNBILL PROJECT

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