VulPro Monitoring Report 2023

Cape and African White-backed Vulture Breeding Surveys

Image 1: Dwaalboom African White-backed Vulture tree nesting sites. Robin Ryan (Dallas Zoo) assists in our final surveys for 2023.

Summary

In 2023, we successfully monitored six Cape Vulture colonies across northern parts of South Africa. A total of 2268 breeding pairs were observed in our initial surveys and a total of 2295 active nests for the year were recorded. Tree nesting surveys of the African White-backed Vultures covered three areas comprising of 21 properties with 144 active nests observed during our initial surveys.

The six Cape Vulture colonies surveyed comprise approximately 50 – 60% of the entire breeding population, with Kransberg and Manutsa being two of the largest colonies. Breeding success across the colonies varied between 25% and over 100%. The colony at Moletjie showed the largest decline in numbers, whilst Kransberg and Skeerpoort were the only colonies to show an increase in breeding success this year.

In addition to the six monitored colonies, a site survey was carried out on a property near the Zastron Colony in the Free State Province. This area once a breeding ground for Cape Vultures suffered declines in numbers and reports of the birds not returning to the colony to breed. Last records of breeding at the colony were over 20 years ago. Reports of vultures returning to the colony in 2020 led Dawie de Swardt from the National Museum to carry out a survey. He surveyed approximately 60 birds leaving the colony and counted to 200 birds in the area. Since 2020 no new records have been published. Our team visited the site near breeding season this year as local farmers reported seeing vultures returning to the colony to roost. Although, no evidence of breeding was observed during the site survey, we will return to the area to monitor the bird's behaviour in hope they begin to breed there again.

The three sites surveyed for the African White-backed Vultures stretched over 21 properties and an approximate breeding success of 88% was recorded. This is an increase on last year's figures, likely due to additional nests being observed at the Dwaalboom sites during our final surveys. Although an increase in nests was observed, active nests across the three sites showed a reduction in numbers during the year. All three sites showed a decrease in active nests in our initial surveys with the Dwaalboom site being the only one to have an increase at the end of our survey period.

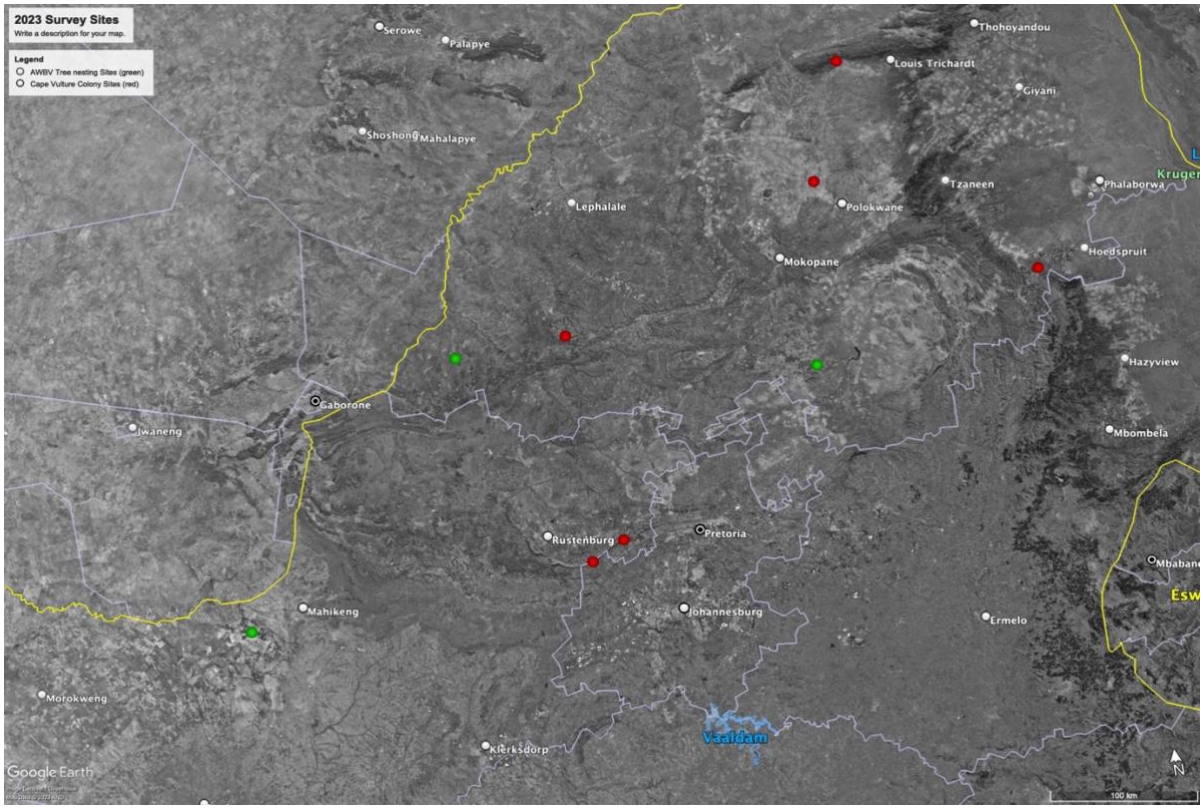

Figure 1: Map of the Cape Vulture (Red) and African White-backed Vulture (Green) breeding sites monitored by VulPro across northern parts of South Africa.

Survey Overview and Methods

Four of the six Cape Vulture colonies are visited twice per year and the two Magaliesberg colonies (Nooitgedacht and Skeerpoort) are visited three times per year due to their proximity to VulPro's headquarters in Hartbeespoort. The first survey sites are visited from May to June to record the number of active breeding pairs, the second visit is from July to August to record total number of active nests and the final surveys are done from September to October to record the total number of fledglings. The final figure provides us with a good picture breeding success for the year.

Using defined observation points, we observe and record breeding behaviours using spotting scopes and following the colony monitoring protocol (for the full protocol, see Wolter *et al*, 2020). During 2023, the following colonies were monitored: Kransberg in the Marakele National Park, Manutsa Colony at the Cape Vulture Lodge near Hoedspruit, Soutpansberg in the Vhembe District; Moletjie in the Moletjie Municipal nature Reserve and Skeerpoort and Nooitgedacht colonies on the Magaliesberg Mountain range (listed in Table 1).

Tree nesting surveys were conducted twice during 2023 at three of our existing sites. The sites include the Roedtan and Dwaalboom area in the Limpopo Province and the Mareetsane area of the North West Province (See Table 1). All surveys were conducted following the guidelines and protocols set out in the "Southern African Vulture Tree Nesting Survey Protocol" by Wolter *et al*, 2020. Unlike cliff monitoring surveys, tree nesting surveys are conducted on foot, walking routes known to have tree nesting species. Activity and behaviour are recorded for known nests observed along the routes. New nests identified during the survey are recorded, along with behaviour and these are added to the existing database for the area. All nests are then visited during the following years survey seasons to assess behaviour and breeding success.

Table 1: VulPro's 2023 vulture monitoring sites across South Africa.

Site	Work	Province	Country	Land Ownership/Use
Manutsa	Colony	Limpopo	South Africa	Private residential
Kransberg	Colony	Limpopo	South Africa	Protected government, Marakele National Park
Magaliesberg (Skeerpoort & Nooitgedacht)	Colony	North West & Gauteng	South Africa	Private Biosphere Reserve
Moletjie	Colony	Limpopo	South Africa	Protected Limpopo Provincial government
Soutpansberg	Colony	Limpopo	South Africa	Community Owned
Mareetsane Area (five farms in total)	Tree Nesting	North West	South Africa	Private game and hunting reserves; pig and cattle farms
Dwaalboom Area (12 farms in total)	Tree Nesting	Limpopo	South Africa	Private game and hunting reserves, cattle farms.
Roadtan Area (four farms in total)	Tree Nesting	Limpopo	South Africa	Private game and hunting reserves

VulPro uses the following behavioural descriptors to deduce the total number of breeding attempts and to assess the percentage of successful attempts:

- Brooding: an adult is seen on the nest in a guarding or shading posture denoting the presence of a chick.
- Chick: chick/nestling is seen; a pair or individual bird is seen feeding a chick, but the chick is not actually seen, or a pair or individual bird behaves in a manner indicative of a chick being present.
- Copulation: a pair is seen mounting and/or copulating at a nest.
- Fledgling: a large chick/ nestling is seen, or when a fledgling is seen.
- Hidden: there appears to be breeding behaviour at a ledge or crevice, but the observer cannot accurately see to record the data.
- Incubation: an individual bird is laying in a manner indicative of incubation behaviour which is different from sleeping position.
- Tenanted: a pair or individual bird is present at a nest where, based on the behaviour of either the pair or of an individual bird, breeding is suspected.
- Working: an individual bird or pair is actively building a nest on a ledge.
- Lost: lost nest, there was a nest during previous years surveys, but it is no longer in use.
- Fledgling: a fledgling is observed at or near a nest.
- Dead: any birds found deceased near or on a nest.

Cape Vulture Colony Breeding Surveys

In 2023, we recorded a total of 2268 active nests during our initial surveys at the six Cape Vulture colonies in the northern parts of South Africa (Table 2). We observed an 11% increase of active nests between our 2022 (active nests 2036) and 2023 surveys, indicating a growth in the overall population. Number of fledglings recorded during our 2023 (fledglings 2202) surveys were up by approximately 30% in comparison to our 2022 (fledglings 1669) surveys. The increase in fledgling numbers resulted in an overall average breeding success for 2023 of 83% across the six colonies surveyed. The success varied from 25% to over 100%.

Although this all points to good news for the population, we have observed some worrying declines at the Moletjie colony between 2022 and 2023 and within our 2023 survey period. This colony experienced breeding success of 25% for this reporting period which is approximately half the success rate of 2022. As a result of this information, our education team has sprung into action, and we are working closely with local communities, schools and rangers who look after the protected area where the colony is located. So far, our efforts have resulted in an increased interest and enthusiasm amongst the community for the plight of vultures and we hope this will aid in further protection for vultures in the area. On the positive side fledgling numbers for Kransberg; Skeerpoort; Nooitgedacht, Manutsa and Soutpansberg were higher than those observed in 2022.

The increase in active nests at the Kransberg and Skeerpoort colonies, resulted in an increase in fledgling numbers too. The Manutsa colony interestingly showed a small reduction in active nests for 2023 (726 active nests) in comparison to 2022 (737 active nests) but an increase in fledgling numbers (from 439 in 2022 to 650 in 2023). Another interesting result is the Nooitgedacht colony, for 2023 active nests were slightly lower than in 2022 (153 compared to 156 respectively), with fledgling numbers dramatically increased (57 in 2022 to 138 in 2023), the difference in numbers recorded could be for many reasons, for example weather conditions during 2022 surveys could have impacted visibility of nests or impacted overall success of nests between survey periods. Although we aim to undertake surveys during the same months every year, we must account for the changes in our climate and how these may impact vulture colonies.

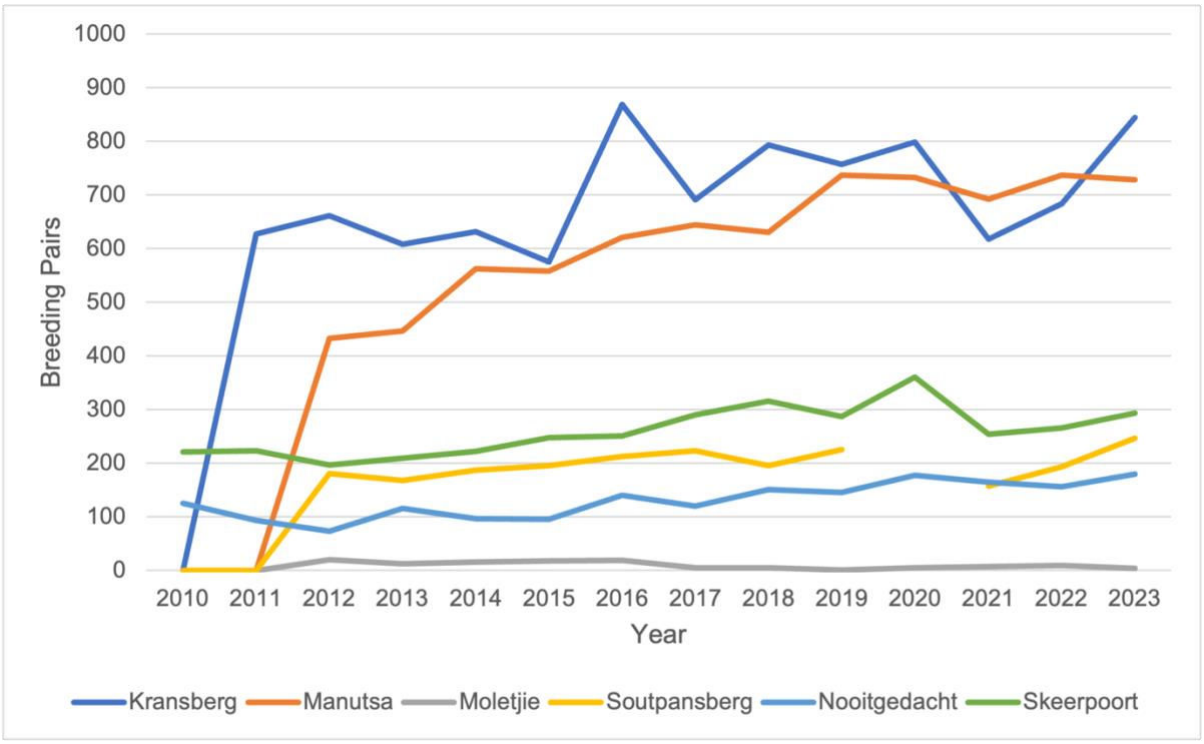

Figure 2: Annual estimates of breeding pair numbers at each of the six Cape Vulture colonies monitored by VulPro throughout northern parts of South Africa.

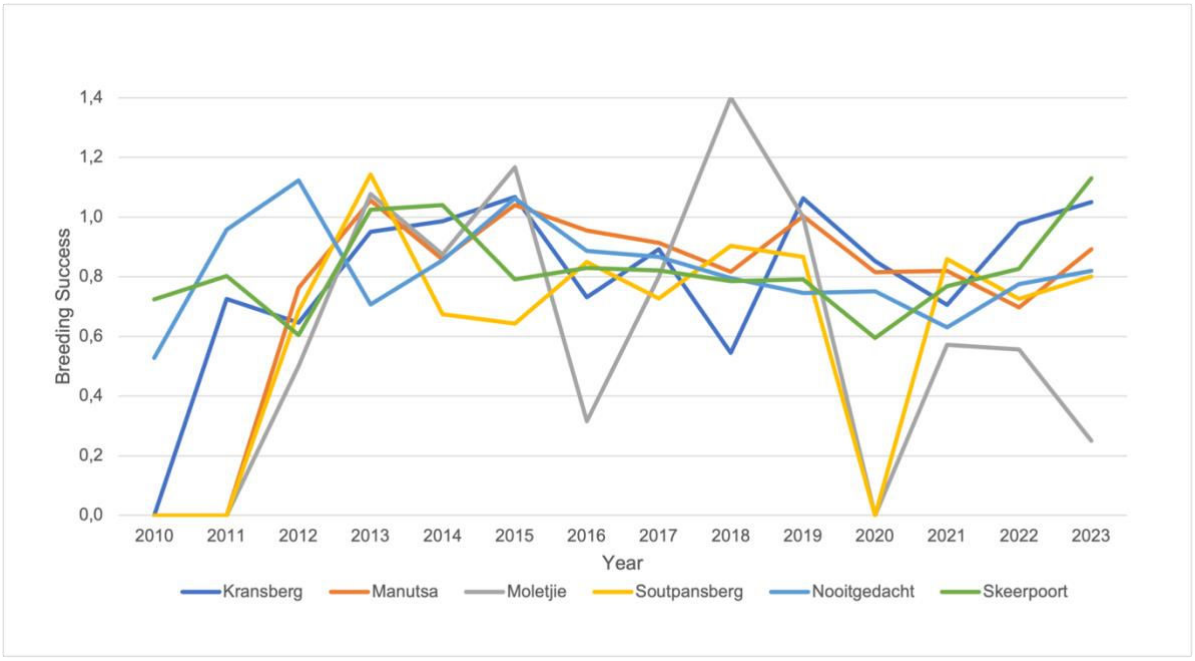

Figure 3: Annual breeding success at each of the six Cape Vulture colonies monitored by VulPro throughout northern parts of South Africa.

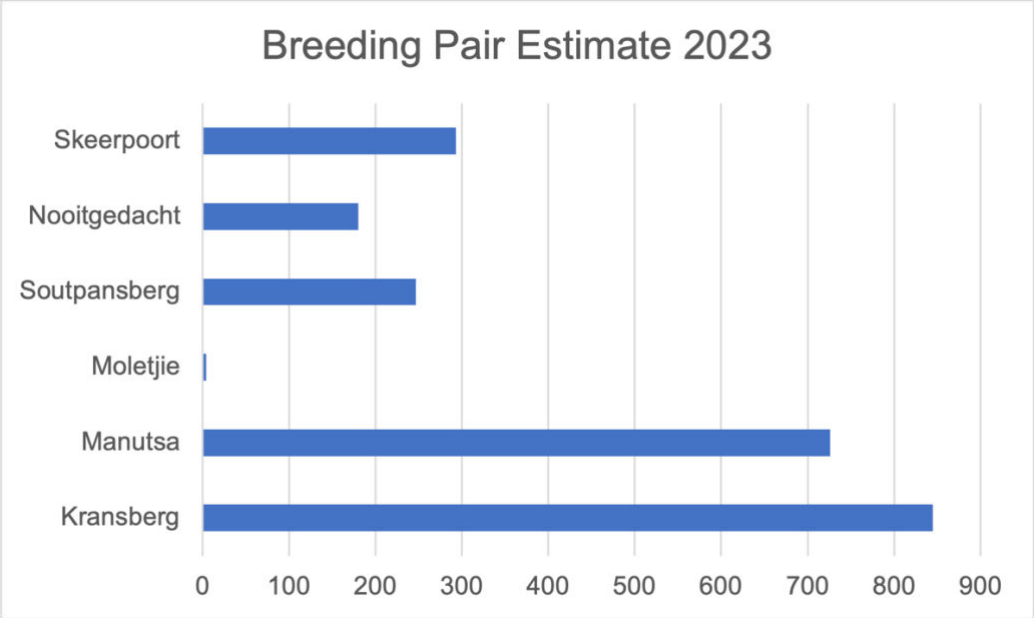

Figure 4: Breeding pair estimates for 2023 from all six Cape Vulture Colonies monitored by Vulpro.

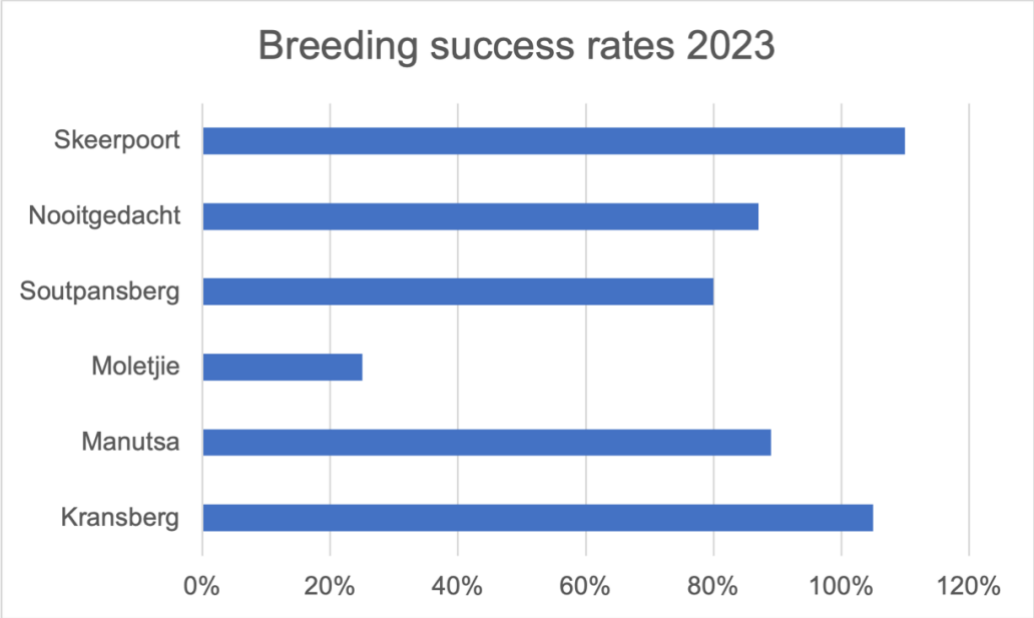

Figure 5: Average breeding success rates for 2023 for the six Cape Vulture colonies monitored by VulPro.

Table 2: Cape Vulture monitoring data for 2023 recorded during surveys for each colony.

Colony	Survey 1	Survey 2	Survey 3
Manutsa	Pairs: 726		Fledglings: 650 Inferred: 0 Total: 650
Kransberg	Pairs: 845		Fledglings: 894 Inferred: 8 Total: 902
Skeerpoort (Magaliesberg)	Pairs: 293	Fledgling: 0 Chicks: 16 Inferred: 267 Total: 283	Fledglings: 321 Inferred: 9 Total: 330
Nooitgedacht (Magaliesberg)	Pairs: 153	Fledgling: 0 Chicks: 0 Inferred: 166 Total: 166	Fledglings: 138 Inferred: 9 Total: 147
Soutpansberg	Pairs: 247		Fledglings: 198 Inferred: 1 Total: 199
Moletjie	Pairs: 4		Fledglings: 1 Inferred: 3 Total: 4
Total:	Total Pairs: 2268 *~48% of the global population***		

***Global population estimate of 4,700 breeding pairs taken from Birdlife International (2023) Species Factsheet.*

The global population is estimated to be 4700 breeding pairs and Hirschauer *et al*, (2020) estimated that the species stronghold in the north-eastern parts of South Africa contained an estimated 3560 breeding pairs, representing approximately 56-74% of the global population. The total number of breeding pairs recorded during VulPro's census at each site represents approximately 48% of the total global population of the vulnerable Cape Vulture. Each year we continue to engage with landowners, stakeholders, and local communities to highlight the plight of these keystone species and how helping us protect them through education and awareness campaigns can save a species.

Image 2: Cape Vulture colonies are monitored from nearby sites using spotting scopes and reference photos of the cliffs. Volunteer Sue Fox being trained by VulPro staff on how to use a spotting scope (Left) and VulPro staff monitoring the colony (right).

Tree Nesting Vulture Surveys

Currently, VulPro monitors three tree nesting vulture breeding areas in South Africa, namely, Mareetsane in the North West Province and the Dwaalboom and Roedtan areas of the Limpopo Province (Table 1). Many nest sites in the regions surveyed are often inaccessible on foot or by vehicle due to bush encroachment and dangerous game and this year we able to overcome these challenges during our second surveys by using a drone. This has been a revelation in our work, allowing us to access nests that we would not have been able to access previously. The drone has enabled us to confirm presence of chicks at nest sites and has resulted in some very interesting observations.

Using the drone during our second survey season for year, we were lucky enough to confirm a Lappet-faced Vulture nest. A very exciting find, as we know very little about their breeding and nesting behaviour. The drone helped us confirm a chick at the nest and we were able to follow up our surveys with ther fitment of a GPS tracking device to the youngster. The tracking device will provide us with invaluable information about the species movement ecology of this illusive species and we are excited to see this youngster take flight.

Image 3: VulPro CEO, Kerri Wolter, fits the GPS tracking device to the young Lappet-faced Vulture, Dwaalboom, South Africa.

Whilst the use of the drone gave us lots to be excited about, it also enabled us to confirm the presence of a young chick at a nest with a dead adult below. Without intervention the chick would come to untimely death. Confirmation of no returning parents to the nest enabled us to assess the chick's well-being early on and we were able to swiftly intervene, removing the chick from the nest and taking it in to our care. Back at VulPro's main centre in Hartbeespoort, North West Province, the chick is doing well and growing up quickly. Once old enough, the chick will be released along with other 2023 fledglings being cared for at VulPro.

Image 4: Young African White-backed vulture confirmed alone in his nest after a dead adult was found below. Safely removed and transported to VulPro, he was put with foster parents and sibling in our captive breeding programme. It will be released back into the wild alongside it's adopted sibling once they are old enough to leave.

The Mareetsane area of the North West Province was surveyed twice in 2023. This area consists of five farms, namely, Bakoven (pig, cattle, and game farm); Omega Game Ranch (hunting and game farm); La Rancho (hunting and game farm); Woodside Lodge (hunting and game farm) and Woodside Cattle Farm. Breeding success for the area in 2023 was 56% with 45 successful breeding attempts, these numbers show a decline of 10% in the population for the area between 2022 and 2023 surveys. During our surveys in this area and with use of drone, we unfortunately confirmed six dead chicks at nests, which is a big loss for this population. Whilst we cannot confirm the reasons behind these population declines, we are concerned that there may be a link to poison in the area. We believe that this is most likely an indirect effect of farmers poisoning perceived pests, such as jackals or through lead ingestion because of hunting practises in the region. To mitigate further declines in population numbers for the area, we aim to improve our educational and outreach programmes in the region, to host meetings and give presentations to farmers and landowners in efforts to raise awareness of the effects poisoning has on vulture species and why we need to conserve vultures.

The Dwaalboom area of the Limpopo Province was also surveyed twice in 2023. This region consists of multiple farms, and we successfully surveyed 12 farms in total for the year, all of which are cattle or game farms. For the second year running Dwaalboom showed the highest breeding success rate (approximately 139%). The increase in breeding success is attributed to the use of a drone during our second surveys for the year when more inaccessible nesting sites were located, and confirmation of chicks was made. During our initial surveys we were only able to record a total of 53 active nests, however with the drone the survey effort enabled us to confirm 74 active nests, leading to high breeding success rate.

Image 5: VulPro researcher, Clarence Mabasa, flies our new drone in the field, allowing us to observe nests previously inaccessible to us.

The Roedtan area of the Limpopo Province was also surveyed twice in 2023. This region consists of four farms, namely Bosvveld, Nooitgedacht, Harlou and Renosterfontein, all of which are cattle or game farms. Much like the Mareetsane region, Roedtan's breeding numbers were also lower in 2023. Breeding success rates, however remained relatively stable in comparison to 2022, (69% in 2022 and 70% in 2023). For the most part the population is relatively stable. One area of interest to us are farms that have had new nests observed this year. The Bosveld farm had two new nests during our initial surveys in 2023, this doubles the number of active nests for the property. Unfortunately, none of the four nests were still active during our final survey for the year, however two new nests were found on a nearby farm. The numbers do not represent a large change, but it is one we will keep an eye on in the future to see how site selection might be changing in the area.

Table 3: Tree nesting survey results for 2023 indicating breeding success recorded for African White-backed vultures across the three sites surveyed.

Location	Active Nests (May/Jun 2023)	Active Nests (Sept/Oct 2023)	Estimated Breeding success 2023
Mareetsane	81	45	56%
Omega Game Ranch	61	34	56%
La Rancho	10	6	60%
Woodside Lodge	4	2	50%
Bakoven	3	0	0
Woodside Cattle (New)	3	3	100%
Dwaalboom	53	74	139%
Swartbos	4	4	100%
Rooiderbokvale	3	14	Anomaly.
Numzaan Safaris	13	14	107%
Unknown Roadside	5	7	140%
Groenedal	3	5	166%
Laastepoort	1	0	0
Nando	0	0	0
Loggerinde Hoek	1	1	100%
Leeuwdoorn	1	0	0
Haakdoorn	20	25	125%
Kallie Lee Farm	0	1	0
Hogenbomen (New)	2	3	150%
Roedtan	10	7	70%
Bosveld	4	0	0
Nooitgedacht (ASC Farm)	0	0	0
Harlou	1	0	0
Renosterfontein	5	7	140%
Total	144	126	88%

The breeding data collected this year will also be added to the larger project, "*Assessing the effects of thermal factors on the spatial ecology of a Critically Endangered African vulture*". This data is part of the chapter on how breeding site selection and breeding success of African White-backed Vultures may be affected by climatic variables such as temperature and rainfall. We are excited to report that we are now moving into the analysis of this data and the historical data collected for this project and we look forward to preliminary results in the coming months.

Image 6: Dallas Zoo volunteer, Robin Ryan, accompanied VulPro into the field for 4 days to survey nests in the Dwaalboom area, South Africa.

Conclusion

To continue our efforts to halt the decline of African vultures, it is imperative that we monitor breeding populations. Breeding populations give us a good indication on how the species is doing and as we have observed this year, highlight various threats faced by the species which need to be addressed. For example, the decline in population numbers at the Moletjie Colony, through communication with the colony rangers, highlighted the need for increased community engagement and education to be bought to the area. By acting swiftly and mobilising our education team, we can already see an enthusiasm amongst the community to protect the vultures and we hope this will ensure the colony in the area begins to grow instead of decline.

Our tree nesting surveys this year highlighted a similar need for us to increase our presence in the Mareetsane area and investigate why so many chicks had died at their nesting sites. There could be several factors at play that resulted in their deaths and without us increasing our engagement with local farmers and landowners we will not be able to mitigate future declines. We hope this data and its use towards the larger study looking at the effect of thermal factors on the spatial ecology of these critically endangered vultures will provide additional answers to why so many chicks were lost this year. Making discoveries such as finding deceased chicks or adults at nesting sites, or discovering new nests is all valuable data which we can put towards numerous research projects which will help guide our efforts to protect vultures.

The fieldwork conducted is one element of our work to halt vulture population declines. The numbers and information gathered during our fieldwork is fed back to landowners, stakeholders and the community living amongst these populations. Sharing this data and providing education to these groups living amongst vulture populations provides us with insight into threats vultures face in all areas, enabling us to mitigate for them and increase protection of the species. Through our educational programmes we distribute educational material, give presentations and where possible we take groups out into the field to see vultures for themselves, active engagement such as this truly builds enthusiasm for the species and helps us inspire communities living amongst vultures to help us save them. These communities become our eyes and ears for vultures.

Acknowledgements

Vulture counts are only possible with the support of all landowners involved: Bakoven Farm, Boelani Farm, Bosveld Farm, Cape Vulture Lodge, Dotreg Farm, Elandskloof Farm, Griffons Bush Camp and Groothoek, Haakdorn, Harlou, Groenedal Farm, Kallie Lee Farm, Laastepoort, La Rancho Farm, Leeuwdoorn Farm, Leopard Lodge, Loggerinde Hoek, Moletje Nature Reserve, Nando Farm, Nooitgedacht Farm, Numzaan Safaris, Omega Game Ranch, Plumari Private Reserve, Renosterfontein, Rooiderbokvale, Soetdoring Farm, Soutpansberg Community, Swartbos Farm, Ultimo Farm, Dronfield Nature Reserve; Koot Kloppers from Zastron and Woodside Lodge.

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