VulPro Monitoring Report 2024

Vulture Cliff and Tree-nesting Breeding Surveys

VulPro - Vulture Programme (www.vulpro.com)

Introduction

In the last thirty years, African vulture populations have declined by over 80%, due to ongoing and rising threats such as energy infrastructure, poisoning, and the illegal wildlife trade for belief-based purposes. As keystone species, vultures are vital for ecosystems, neutralising pathogens and aiding in the prevention of diseases spreading through the removal of carcasses from the environment. While being exposed to a wide array of external threats, their slow reproductive rates and late maturity further heighten their vulnerability, making breeding disruptions critical to extinction risk. A crucial step towards the implementation of effective conservation management practices is a detailed understanding of current populations trends and the evaluation of emerging threats. This enables the development of targeted conservation measures that directly address the most pressing issues, as opposed to often less-effective, broad-brush solutions.

Recognising this need, VulPro has been actively monitoring vulture breeding activity since 2010, analysing population trends, and identifying key vulture hotspots and threats across southern Africa. Given the importance of consistent, long-term data for the effective evaluation of populations dynamics, VulPro is committed to continuing its vital data collection efforts of both tree and cliff nesting African vultures.

Summary

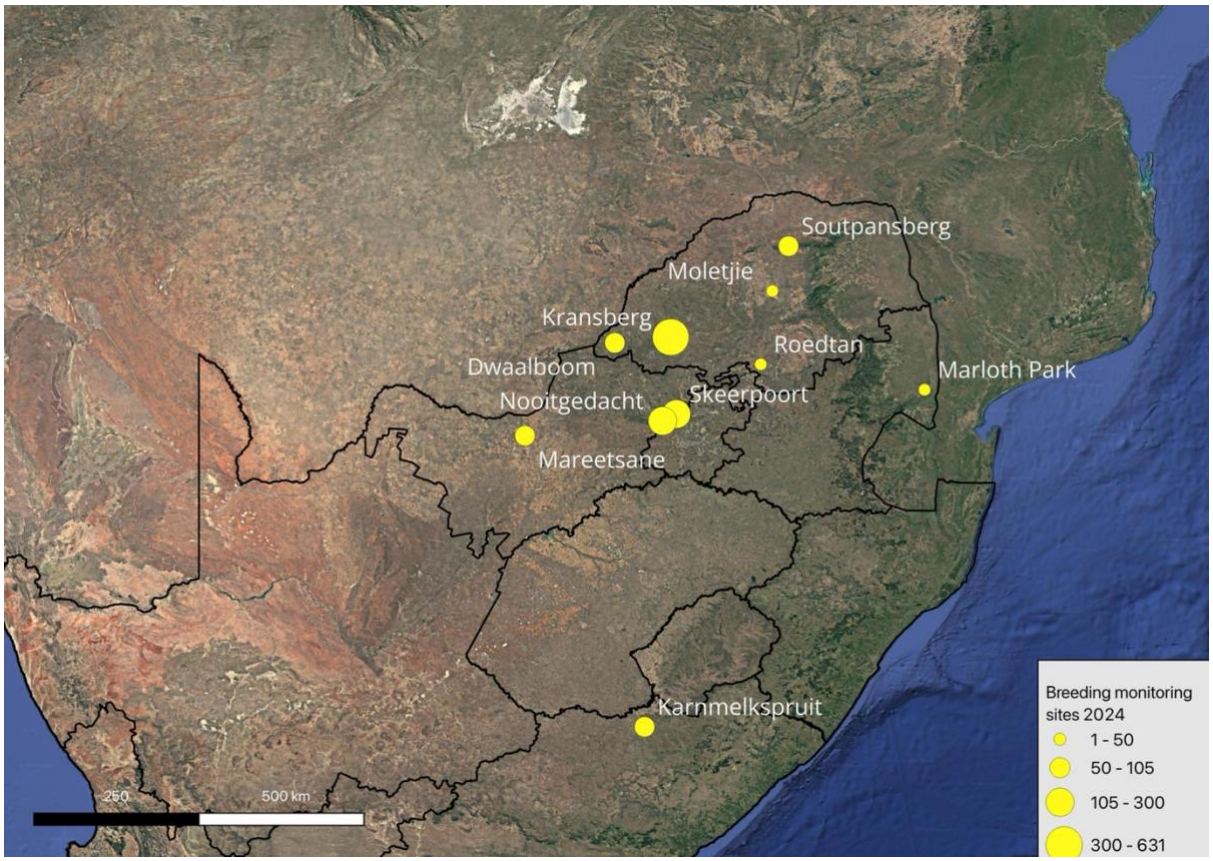
In 2024, VulPro's monitoring programme successfully surveyed ten vulture breeding sites across five provinces in northern South Africa. Six of these, Kransberg, Moletjie, Soutpansberg, Nooitgedacht, Skeerpoort and Karnmelkspruit, are cliff-nesting sites, while the remaining four—Dwaalboom, Roedtan, Mareetsane, and Marloth Park—are tree-nesting locations.

Our cliff monitoring primarily focuses on Cape vultures, southern Africa's only endemic vulture species, currently listed as Vulnerable by the IUCN. This year, VulPro recorded 1,463 active Cape vulture nests across the five cliff sites, a slight decline compared to the 1,569 nests observed in 2023 in the same areas. These colonies account for 20–30% of the global breeding population of Cape vultures, with Kransberg in Marakele National Park remaining our largest site. Annual breeding success varied significantly among sites, from just 25% at Moletjie, with only one fledgling recorded, to 104% at Nooitgedacht, where 178 nests were observed.

In addition to monitoring cliff-nesting vultures, VulPro's surveying team continued to extend its surveys to tree-nesting species, including White-backed, Lappet-faced and Hooded vultures. Long-established monitoring sites, such as Dwaalboom, Roedtan, and Mareetsane, provided valuable data on recent population trends. Covering a total of 20 properties and recording a total 137 vulture nests, our overall results revealed a slight decline at Dwaalboom, a modest increase at Roedtan, and stable numbers at Mareetsane.

In an effort to expand our surveying range, this year we extended our monitoring to include a Cape vulture colony in Karnmelkspruit, Eastern Cape, where we recorded a thriving vulture population with 61 new nests, and Marloth Park in Mpumalanga, where our research yielded a rare Hooded vulture nest tucked away in the branches of a Jackalberry tree.

Figure 1: Map of the vulture breeding sites monitored by VulPro in 2024, differentiated by colony population size.



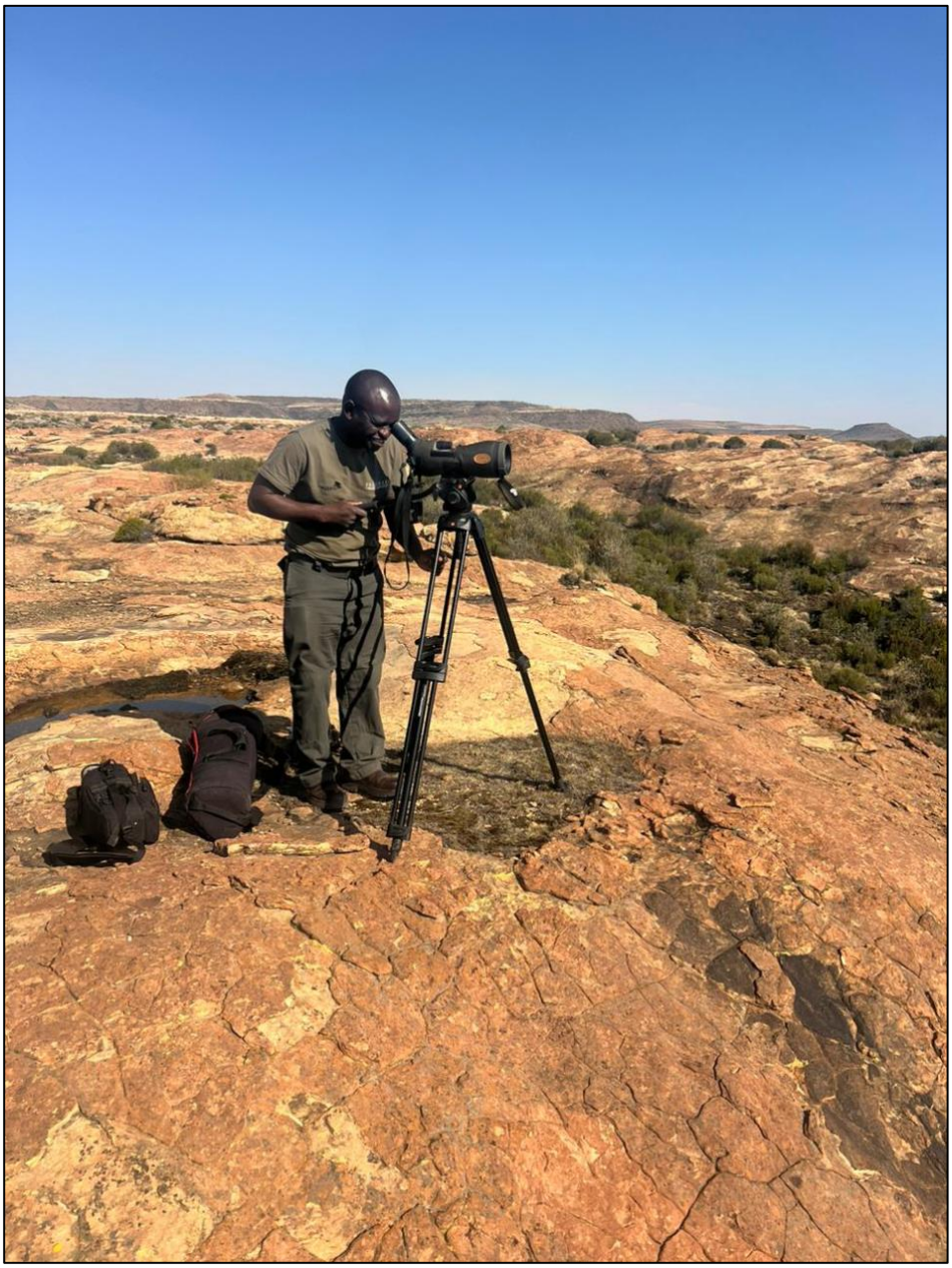
Survey Overview and Methods

VulPro has been conducting vulture nesting surveys across southern Africa for over a decade, continually refining its methods and protocols to ensure the highest level of accuracy and efficiency in the field. By following detailed, step-by-step procedures, the team ensures consistency in data collection, allowing for reliable comparisons between observers and sites. This approach enables the monitoring and analysis of population trends over extended periods.

All tree- and cliff-nesting sites are monitored a minimum of twice a year, allowing us to assess annual breeding success and highlight variables affecting population dynamics. This regular monitoring helps ensure that the results are robust and meaningful, supporting ongoing conservation efforts.

Our Cape vulture breeding monitoring programme employs a detailed and systematic approach to track and protect this vulnerable species. We begin by identifying and mapping cliff-nesting colonies using high-quality equipment, such as spotting scopes and cameras. These photographs help us assign unique identifiers to each nest and document their precise location on the cliff, which we can then track over time through the use of telescopes. Each nest is closely monitored for specific behaviours—such as incubation, brooding, or the presence of nestlings—and recorded using standardised codes, ensuring consistency and accuracy across different observers and monitoring sites.

Figure 2: VulPro surveyor Obert Phiri surveying Karnmelkspruit cliff colony using telescopes, 2024



In addition to monitoring nest activity, our team collects valuable background information on each colony, including historical data, land-use patterns, and potential threats like poisoning, persecution, or habitat loss. This comprehensive approach allows us to track long-term population trends, assess breeding success, and develop targeted conservation strategies to help reverse the decline of Cape Vultures.

For our tree-nesting species, we use a combination of walking, drone, and vehicle surveys to ensure both accuracy and efficiency. Walking surveys are preferred, as they cause less disturbance to the birds and avoid the biases introduced by road-accessible areas, which vehicle surveys can sometimes miss. However, walking surveys are not always practical on larger properties due to factors like vast distances,

bush encroachment, or dangerous wildlife. In these cases, we supplement walking surveys with drone and vehicle methods to cover larger areas effectively.

Figure 3: VulPro surveyor Juliana Pinto operating drone for tree-nesting monitoring of White-backed vultures in Dwaalboom, 2024

Armed with GPS devices and binoculars, our researchers carefully observe and document the presence and behaviour of vultures at each nest, using similarly standardised codes as in cliff-nesting monitoring to ensure consistency. Newly discovered nests, whether identified during surveys or reported through community engagement, are integrated into our monitoring programme and tracked during subsequent visits. Additionally, we gather data on environmental factors such as temperature and aridity, which can impact breeding success.

For both nesting types, VulPro records observed vulture behaviour using a set of standardised behavioural descriptors:

- **Brooding:** An adult is seen on the nest in a guarding or shading posture, indicating the presence of a chick.
- **Chick**: A nestling is observed, or a pair is seen feeding a chick, although the chick itself may not always be visible.
- **Copulation**: A pair is observed mounting or copulating at the nest.
- **Fledgling**: A large chick or fledgling is seen at or near the nest.

- **Hidden**: Breeding behaviours is inferred, but the nest is obscured, and the observer cannot clearly document the activity.
- **Incubation**: An adult is seen in a typical incubation posture, as opposed to simply resting.
- **Tenanted**: A pair or individual bird is present at a nest, with behaviour suggesting active breeding, though no direct evidence of eggs or chicks may be visible.
- **Working**: An adult or pair is actively building or modifying a nest on a ledge.
- **Lost**: A nest previously recorded is no longer in use.
- **Dead**: A deceased bird is found near or on a nest.

By carefully recording these behaviours, VulPro is able to deduce the total number of breeding attempts at each site and assess the breeding success rate at the end of each year. This data helps us identify trends in vulture reproduction, evaluate population health, and guide the development of targeted conservation strategies to support the species' recovery.

Table 1: VulPro's 2024 vulture monitoring sites across South Africa.

Site	**Work**	**Province**	**Land Ownership/Use**
Kransberg	Cliff nesting	Limpopo	Protected government, Marakele National Park
Moletjie	Cliff nesting	Limpopo	Protected Limpopo Provincial government
Soutpansberg	Cliff nesting	Limpopo	Community Owned
Magaliesberg - Nooitgedacht	Cliff nesting	Gauteng	Private Biosphere Reserve
Magaliesberg - Skeerpoort	Cliff nesting	North West	Private Biosphere Reserve
Karnmelkspruit	Cliff nesting	Eastern Cape	Private Biosphere Reserve
Mareetsane Area (6 farms in total)	Tree nesting	North West	Private game and hunting reserves; pig and cattle farms
Dwaalboom Area (19 farms in total)	Tree nesting	Limpopo	Private game and hunting reserves; cattle farms.
Roedtan Area (3 farms in total)	Tree nesting	Limpopo	Private game and hunting reserves
Marloth Park Area (2 sites in total)	Tree nesting	Mpumalanga	Private game reserve and Municipal Government

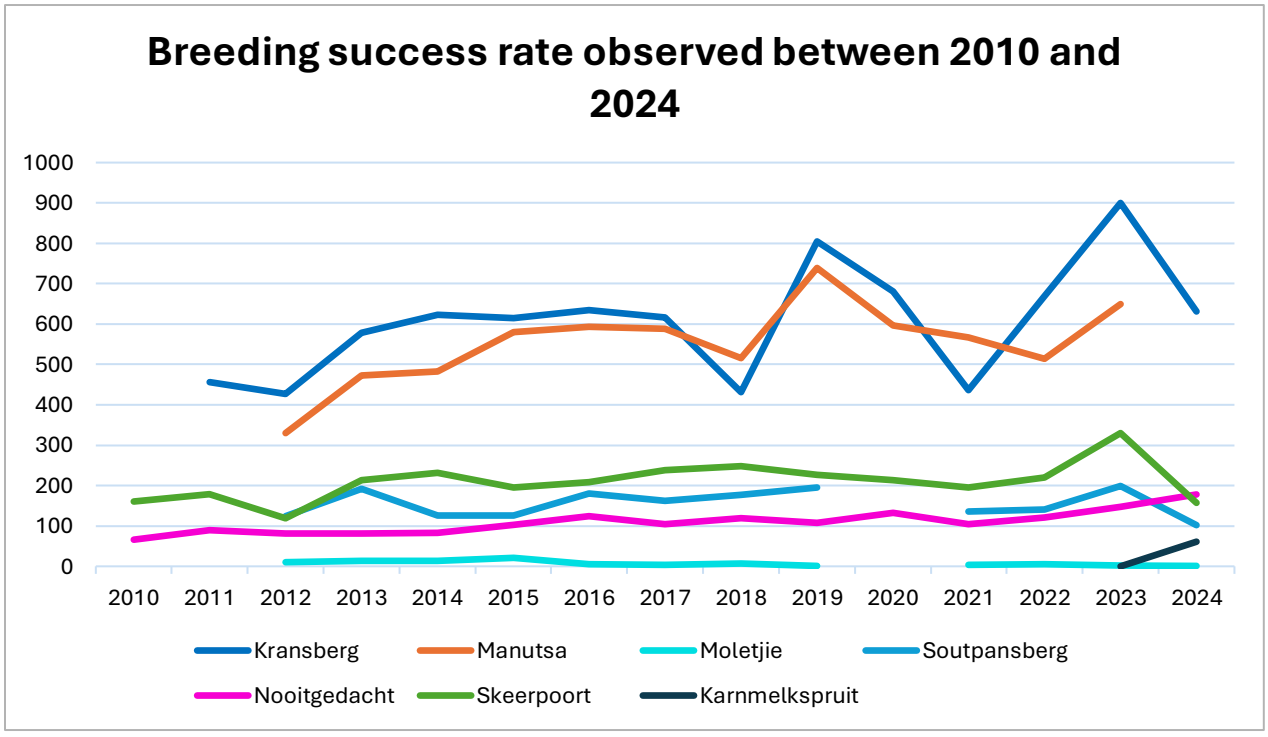
Cliff Breeding Vulture Surveys - Cape vulture Colonies

In 2024, our monitoring team recorded 1,463 active Cape Vulture (*Gyps coprotheres*) nests across six key sites. A nest was classified as active if it was either confirmed—when a chick or fledgling was clearly observed—or inferred, based on breeding behaviours. These behaviours may include incubating, where a bird is observed lying very flat on its nest, or brooding, when an adult is seen guarding or shading its chick.

In comparison, 2023 monitoring at the same sites recorded 1,569 active nests, representing a 6.75% decline in active nests between the two years. It is important to note that while the total number of active nests recorded by VulPro in 2023 amounted to 2,268, this figure included data from the Manutsa colony, one of the largest Cape vulture colonies in South Africa. The site is now monitored separately by colleagues in the conservation sector.

A study by Hirschauer et al (2020) estimated there to be 4,800 to 6,350 breeding pairs of Cape vultures globally. The nests monitored by VulPro in 2024 represent approximately 20–30% of these estimated pairs, underscoring the critical importance of these locations in supporting the global population of Cape Vultures.
While a 6.75% decline may not seem severe, it remains crucial to monitor individual sites closely. This data will help determine whether this decrease is an isolated event or part of a broader, more concerning trend, particularly given the already vulnerable status of Cape vultures. Continued monitoring will allow us to identify site-specific challenges and contribute to targeted conservation strategies for this imperilled species.

Figure 4: a comparison of annual breeding success rates observed during second annual visits from 2010 to 2024

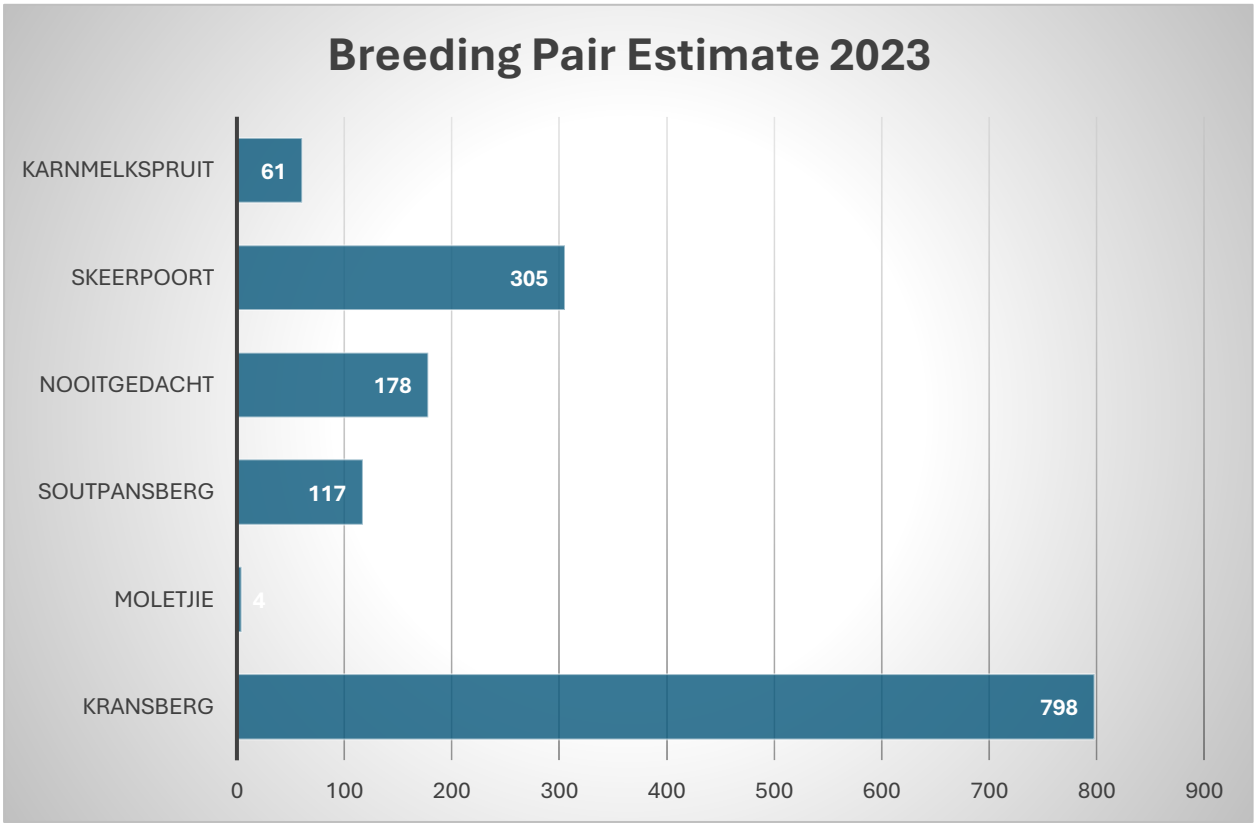


* Surveys at Moletjie and Soutpansberg in 2020 were not completed due to disruptions amongst local communities

While overall success rates show a 6.75% decline, breeding numbers at individual sites have exhibited significant fluctuations over the years. Sites such as Kransberg and Manutsa consistently report high numbers, with notable peaks in 2018 and 2022, underscoring their importance as key breeding strongholds. However, Kransberg and Soutpansberg have also displayed considerable variability, raising concerns about long-term population stability.

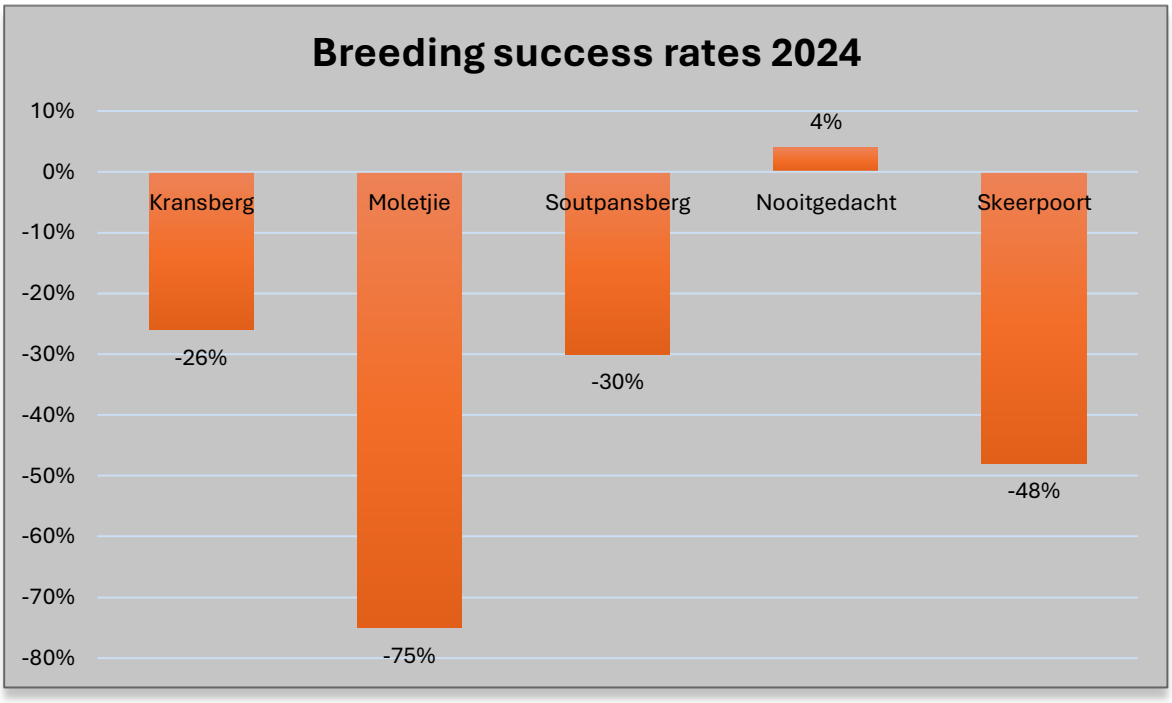
At the other end of the spectrum, the smallest monitored colony, Moletjie, has shown a worrying decline since monitoring began, with only one confirmed chick recorded in 2024. In contrast, Nooitgedacht has demonstrated steady growth, increasing from 66 breeding pairs in 2010 to 178 pairs in 2024, reflecting favourable local conditions. Skeerpoort, meanwhile, has experienced pronounced fluctuations, reaching a peak in 2023 before experiencing a sharp decline in 2024.

Figure 5: 2024 annual estimates of breeding pair numbers based on the highest number of Cape vulture observed at each colony in 2024 for all sites observed a minimum of two times annually



A closer analysis of breeding success rates in 2024 reveals notable variability across monitored sites. Nooitgedacht stood out as the best-performing colony, showing a slight increase of 4% in breeding success compared to estimates from the first annual visit. This contrasts with declines observed at all other sites, with Kransberg, Soutpansberg, and Skeerpoort showing breeding success rates of 74%, 70%, and 52%, respectively, relative to initial estimates. While some decrease in breeding success is expected, as Cape Vulture success rates typically range between 60% and 80% depending on environmental conditions and threats (Borello and Borello, 2002), the sharp declines at certain sites are cause for concern.

Figure 6: 2024 annual breeding performance of monitored Cape vultures in relation to estimated breeding pairs obtained during first visit.



With only one active nest recorded in 2024, any decline at Moletjie will inevitably have a disproportionately large impact on the overall breeding success estimate for this site. This single active nest reflects the critically low breeding population at Moletjie, emphasising the precarious status of the colony. Surrounded by encroaching human development, Moletjie serves as a stark example of the threats faced by vulture breeding populations. These threats range from human presence near nesting sites, which can cause significant disturbance, to more severe pressures such as habitat destruction and poaching. Without urgent conservation interventions, small colonies like Moletjie face a serious risk of local extinction. Such losses would not only diminish regional population numbers but could also have cascading effects on the broader Cape Vulture population, further jeopardising the species' long-term survival.

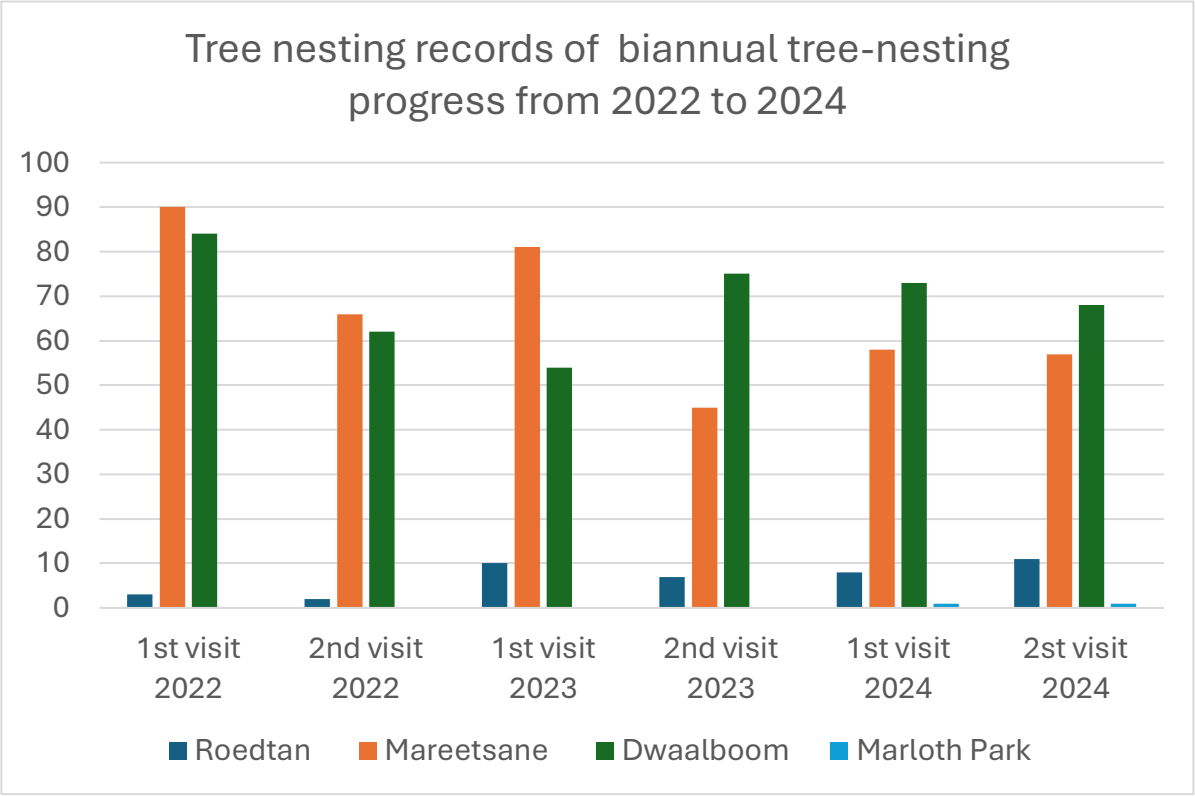
This year's second monitoring trip included the addition of Karnmelkspruit, a Cape vulture colony located in the Eastern Cape. This expansion is part of our broader efforts to enhance our monitoring reach, especially in areas that have previously been overlooked. By incorporating such sites, we aim not only to track rising and declining trends at well-known locations but also to assess the health of other populations and identify new hotspots. In 2024, 61 breeding pairs were observed at Karnmelkspruit, underscoring the site's significance for vulture conservation. This addition provides valuable insights into vulture breeding in previously unmonitored regions and we look forward to evaluating the site's population trends again next year.

Tree Nesting Vulture Surveys – White-backed, Lappet-faced and Hooded vultures

While undertaking cliff nesting surveys, VulPro's team has also been monitoring tree nesting vulture species for over a decade. These include White-backed vultures (*Gyps Africanus)*, listed as critically endangered by the IUCN, the endangered Lappet-faced vulture (*Torgos tracheliotos*) and critically endangered Hooded vultures (*Necrosyrtes monachus*).

Long-established monitoring sites, such as Dwaalboom, Roedtan, and Mareetsane, provided valuable data on recent population trends. Our monitoring activity took place across 20 different properties, where we recorded a total 137 vulture tree nests. Our overall results revealed a slight decline at Dwaalboom, a modest increase at Roedtan, and stable numbers at Mareetsane.

Figure 7: White-backed records of active nests observed every year from 2022 to 2024 on a biannual basis.



At a more detailed and case-specific level, however, our tree-nesting data reveals mixed trends across sites. At Roedtan, there has been a steady increase in successful nests, from 3 in 2022 to 11 in 2024, with a 57,1% increase in the last year alone. It is however important to note that this overall increase is largely due to the addition of a new farm, New Wycombe, in 2023, which has shown consistent growth. In contrast, the other farms within Roedtan have experienced a progressive decline, with nest numbers eventually dropping to zero. Mareetsane shows more fluctuation, with successful nests dropping from 66 in the second visit of 2022 to 45 in 2023, before stabilising at 57 in 2024. These figures reveal an overall 26.7% increase between 2023 and 2024, but our overall results still suggest some instability in the

population. Dwaalboom too presents mixed results, with overall active nests declining from 84 to 73, but with an increase in successful nests observed during second annual visits in 2022 and 2024, from 62 to 68. New sites have been added over time while others have been removed, making definitive conclusions less straightforward. However, the overall population appears relatively stable. Continued monitoring will be needed to assess and address the fluctuating or declining trends of all sites moving forward.

Table 2: Total count of active nests recorded across 4 tree-nesting sites between 2022 and 2024

Location	**1st visit 2022**	**2nd visit 2022**	**1st visit 2023**	**2nd visit 2023**	**1st visit 2024**	**2nd visit 2024**
Roedtan						
Bosveld	2	1	4	0	0	0
Harlou	1	1	1	0	-	-
New Wycombe	-	-	5	7	8	11
Total	3	2	10	7	8	11
Mareetsane						
Bakoven	3	2	3	0	0	0
La Rancho	18	5	10	6	8	6
Omega	57	50	61	34	36	38
Woodside	5	4	4	2	5	9
Mapasgom	7	5	3	3	5	1
Voorfpot	-	-	-	-	4	3
Total	90	66	81	45	58	57
Dwaalboom						
Boelani	2	1	-	-	0	-
Buffalsdoorn	-	-	-	-	0	0
Elandskloof	4	7	-	-	8	4
Groenedal	5	3	3	5	1	3
Haakdorn	22	18	20	25	17	26
Hogenbomen	-	-	2	3	2	2
Kallie Lee	1	1	0	1	0	0
Kom Tot Rust	-	-	-	-	2	1
Laastepoort	2	1	1	0	1	1
Leeudoring	0	0	1	1	5	4
Loggerinde Hoek	1	1	1	1	2	1
Louma Boerdery	-	-	-	-	2	1
Nondo	1	0	0	0	1	1
Numzaan	13	8	13	14	11	10
Rooiderbokvale	13	10	3	14	8	4
Safari and Outdoors	-	-	-	-	1	1
Swartbos	14	7	5	4	4	7
Ultimo	-	-	1	-	1	1
Unknown farms	6	5	4	7	7	1
Total	84	62	54	75	73	68
Marloth Park	-	-	-	-	-	1
Total	-	-	-	-	-	1
GRAND TOTAL	**177**	**130**	**145**	**127**	**139**	**137**

In line with our broader goals of expanding vulture monitoring efforts, this year we extended our survey to include Marloth Park in Mpumalanga. During an initial exploratory survey, our team assessed areas frequented by vultures for potential nesting sites and signs of breeding activity. This led to the remarkable discovery of a rare Hooded vulture nest nestled in the branches of a Jackalberry tree. Given that fewer than 50–100 breeding pairs of Hooded vultures remain in South Africa (Thompson et al., 2017), this finding holds significant conservation value, providing an important opportunity to deepen our understanding of the species' behaviour and breeding success, while also highlighting the importance of ongoing monitoring and conservation efforts in the region.

Additionally, our monitoring in Dwaalboom this year included a visit to Atherstone Nature Reserve, a site we had long hoped to access. Once home to more than 40 tree-nesting vultures, our excitement was tempered as we observed the long-term effects of habitat destruction caused by an unsustainable elephant population. Reserve staff informed us that the elephants' numbers have long exceeded the reserve's carrying capacity, resulting in the loss of the once-abundant suitable nesting trees across the reserve. Our findings at Atherstone highlight the growing challenge of balancing wildlife management with habitat preservation, expanding the list of threats vultures face, and emphasising the need for adaptive conservation strategies.

The Importance of Long-Term Data Collection

Long-term breeding data is critical for building a comprehensive understanding of vulture population dynamics. By analysing current trends and consulting with local property owners about any unusual sightings and events, VulPro can identify specific threats to breeding populations, which helps prioritise areas for protection, ensuring that conservation efforts are focused where they are most needed. This wealth of information provides a solid foundation for addressing essential research questions and refining conservation practices, offering evidence driven guidance for in-situ recovery efforts.

The importance of VulPro's data is evident in the extensive use made of it in numerous past and ongoing studies. One study currently underway is analysing numerous annual datasets collected by VulPro at the Olifants Private Nature Reserve in Limpopo, an important area for White-backed, Hooded, and White-headed vultures. The project aims to evaluate the population status of this important breeding site and to formulate a data management and analysis format that can be used across our monitoring sites.
A PhD study chapter titled "Assessing the Effects of Thermal Factors on the Spatial Ecology of a Critically Endangered African Vulture" is making use of VulPro's data to examine how rising temperatures and global warming influence nest site selection and breeding success rates. The data collected during our surveys, combined with extensive tracking information, is being integrated with temperature and rainfall data from global climate databases in an effort to uncover how these climatic variables affect the breeding success of African White-backed vultures across southern Africa. Meanwhile, VulPro's decade-long monitoring of the Skeerpoort cliffs has informed another key study. By integrating GPS tracking data from 20 Cape Vulture fledglings fitted with devices in 2019, the study seeks to establish survival rates and baseline

behavioural patterns for wild-fledged vultures to use as a benchmark for assessing the success of released captive-bred individuals back into the wild.

In addition to contributing to ongoing research, our monitoring efforts offer a valuable opportunity to expand our awareness campaign. Effective monitoring of both new and existing sites relies on collaboration between VulPro, local landowners, and communities. Local residents are often the first to notice new nests or the disappearance of old ones, providing valuable insights into changes in vulture populations. VulPro's work extends beyond data collection, building strong relationships with landowners to protect breeding colonies on private and community lands. Through outreach and education, VulPro shares its findings to raise awareness about vulture conservation and encourages local communities to take an active role in protecting these important populations. This evidence-based approach is essential for safeguarding critical breeding sites, preventing the loss of vulture colonies, and mitigating the broader ecological effects of their decline.

Figure 8: VulPro surveyor, Clarence Mabasa, and SANParks People and Conservation Officer, Sarah Letsoalo, at Marakele National Park.

Challenges

Our data collection efforts face several challenges. Environmental factors play a significant role in the success of our monitoring. Excessive sunshine, for instance, can hinder our ability to accurately observe cliffs through telescopes, while rain complicates drone flights, making tree-nesting monitoring more time-consuming. Additionally, the vast and often rugged terrain at many of these locations slows down our progress considerably, while limited network coverage and unreliable electricity at several sites further complicate communication and the charging of essential devices. Another challenge is inconsistent access to some areas. While we are fortunate to work with many supportive landowners, access to other sites has not always been straightforward. Changes in ownership also pose challenges, as it can be difficult to get in touch with new owners and rebuild those relationships. One unexpected challenge this year came in the form of wildlife encounters. In addition to the occasional monkey trying to snatch food, this year's Marakele monitoring, was briefly interrupted by an unexpected visitor. A curious young elephant appeared out of the bushes and gradually made its way towards our monitoring station and precious equipment. Fortunately, after a brief inspection, the elephant decided our gear wasn't worth the trouble and retreated as quickly as it had arrived.

Figure 9: A young elephant bull approaching our monitoring station at Marakele

Concluding remarks

We would like to express our heartfelt gratitude to all those who make our monitoring efforts possible. This includes the landowners who provide access to their properties, our generous donors and sponsors whose support sustains our work, the accommodation providers who ensure we have a place to stay during our fieldwork, and the various organisations and individuals we partner with whose collaboration is essential to our success. Your contributions, partnerships, and unwavering support drive our mission forward, ensuring the survival and conservation of Africa's iconic vultures.

A special thank you to our sponsors Colchester Zoo, Dallas Zoo, Ford Wildlife Foundation, Fresno Chaffee Zoo, Greenville Zoo, Hans Hoheisen Charitable Trust, Tulsa Zoo, Tusk Trust, Zoo Miami Wildlife Conservation Fund, and Zoo Zlin-Lesna.
We are deeply grateful to the landowners, accommodation providers and collaborators who welcome us, including Griffons Bush Camp and Groothoek, Marakele National Park, Leshiba Lodge, Soutpansberg Community, Moletjie Nature Reserve, Plumari Private Reserve, Leopard Lodge, Karnmelkspruit River Resort, New Wycombe, Bosveld, Viersteenlaagte, Daisy's Den, Mpumalanga Tourism & Parks Agency, Wild and Free Wildlife Rehabilitation, Atherstone Nature Reserve, Buffalsdorn, Elandskloof, Groenedal, Hogenbomen, Haakdoorn, Kallie Lee, Laastepoort, Loggerinde Hoek, Leeudoorn, Nondo Game Reserve, Numzaan Safaris, Rooderbokvale, Safari and Outdoors, Swartbos, Ultimo, Bakoven, La Rancho, Mapasgom, Omega, Woodside Lodge, and Voorfpot.

We are always eager to expand our monitoring efforts. If you believe vultures may be nesting on your property, please do not hesitate to contact us—we would be happy to come and investigate.

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