VulPro Annual Report 2021

VulPro NPC
Vulture Programme for the Conservation of Vulture Species in southern Africa
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Executive Summary

The last year has certainly had its challenges and it has been a trying year for many NGOs; VulPro has not been immune. It has been a tough year filled with challenges, disappointments, and hardships. But, through all the turmoil, trials, and tribulations, we have continued to spearhead vulture conservation in the country, directly and positively impacting vulture populations and individuals. Having said this, I must reiterate that we have managed to overcome obstacles due to the enormous support and generosity we have received from each one of our sponsors, colleagues, and volunteers. We continue to be indebted to you, and we are so tremendously proud of partnering and working with you all in saving Africa's vultures.

This year's report, once again, highlights the enormity of our work and our accomplishments, with some ground-breaking work being undertaken, in partnership with universities, international zoos, nature conservation departments, landowners and farmers, volunteers and NGOs.

One such partnership is with the Detroit Zoo. After two long years, all five of the Detroit Zoo African vultures were returned to their home soil and now reside at VulPro. This partnership is the first of its kind and represents a monumental step in wildlife conservation. Notably, this is the first movement of critically endangered African vultures from the USA back to their native continent and is only possible because of the existence of VulPro's specialised facility.

Moving away from the captive component of our work and for the first time, in partnership with Cape Nature, the De Hoop Nature Reserve and Biotherm, VulPro successfully fitted nine tracking devices to the first Cape Vulture nestlings of the Potberg colony – a unique stand-alone and the last remaining vulture colony in the Western Cape. We are extremely excited about this project, not only to understand the birds' movements in relationship to pending threats in the area such as wind farms but also to understand the foraging ranges of this isolated colony and whether they remain in the province or disperse.

Our relationships with the various universities continued to grow, with multiple research projects underway and in the pipeline, always striving to better ourselves and to lessen the knowledge gap of African vultures so we can better protect them for generations to come. Partnerships with landowners and farmers, who are on the ground but so often overlooked, grew and expanded throughout the year. We simply cannot forget that these individuals are the real heroes who protect Africa's vultures by supplying food, bathing and drinking water and suitable breeding and roosting areas. In addition, they, too, are our ears and eyes for any compromised birds needing help, as well as for securing these birds until we can get to them.

Let me also mention the contribution of a group of dedicated volunteers who, time after time, drive out to rescue vultures. Thank you for your willingness and dedication. You are indeed vital cogs in our team.

Our conservation efforts cannot be achieved in isolation, and it is through these relationships and partnerships that 2021 has been, yet again, a huge success.

As we go into 2022 and hopefully with reduced Covid-19 impact, we hope that this year will see continued growth in our outreach programme, fewer incidents requiring vulture admissions and increased breeding success both captive and in the vulture colonies.

Kerri Wolter
CEO

Accomplishing VulPro's Mission

Our mission is to protect African vultures through collaboration and innovation.

We aim to implement our mission by striving to meet our objectives as per below:

Rescue and Rehabilitation

By staying on the frontline of helping injured vultures and using rehabilitation methods developed over many years of work, we rehabilitate and release as many injured vultures as possible. We use an on-site hospital that specialises in the immediate care of vultures in need and have collaborated with specialised vets to pin broken wings that have seen vultures fly again.

Captive Breeding for Population Supplementation

In instances where birds cannot be released due to their injuries, we incorporate them into our captive breeding programme. They then can pair up, lay eggs and raise their chicks. We release the youngsters so they can continue to contribute to their populations' survival.

Research for Optimising Vulture Conservation in Africa:

High impact research is conducted at VulPro that contributes to our understanding of vultures in Africa. We strive to improve our research by collaborating with other institutes in a mutually beneficial arrangement that enhances knowledge and expertise transfers around the world. Instances of collaborative research include population monitoring, tracking, and using coloured monitoring leg bands as part of the rehabilitation process and the release programmes. We use GPS transmitters to monitor our released birds' survival and foraging movements. It helps us understand movement patterns and behaviours, such as breeding and roosting sites. The wild populations are monitored annually at breeding sites. We maintain a re-sighting database using camera traps and photographs and relying on public sightings. In this way, we track wild populations, rehabilitated, and ex-captive-bred individuals past the point of transmitter failure. As we are so often in the field, we have been able to engage more with local landowners and extend our outreach programme to communicate the plight of African vultures.

Community Engagement

The communities surrounding the vulture colonies and other areas that vultures use play an essential role in the species' survival. For this reason, we engage with the communities as part of our outreach and education campaign and embark on intensive bi-directional communication where we can understand the communities' concerns. Our education includes presentations, demonstrations, printed educational material and social media.

We strive to ensure that vultures do not become extinct. We all know that it is much harder to re-introduce a species than to move individuals to supplement an existing population.

Chairman's Summary

Writing this report this time last year, I had no idea that we as an organisation would need to face another year in a world still dealing with Covid. Yet here we are again, having endured yet another tough year that has affected all aspects of life and operations in South Africa. Nonetheless, VulPro has come out stronger due to the hard work of our staff, volunteers, sponsors and my fellow board members.
While VulPro has had many successes during the year, a few key achievements were bringing five vultures back home from the States through the help of our international zoological partner, a very successful year of breeding and being able to release over 50 birds following successful rehabilitation.

Although we will likely still have to navigate the restrictions brought about by Covid in 2022, I am confident that the team at VulPro will ensure that the organisation continues to ensure the survival of endangered vulture species while also ensuring that our organisation grows from strength to strength. I also look forward to the further development of the clinical facilities at VulPro, so that vultures continue to receive the best possible veterinary care. While it may be a dream, I would like to see the veterinary facilities at VulPro develop in a specialised avian surgical centre, where injured birds from anywhere in the country can be successfully treated.

Prof. V. Naidoo
VulPro Chairman

Figure 1. Prof. Naidoo holding a Cape Vulture.

Performance Reviews

Rescue and Rehabilitation

By far, our most crucial area of work is rescue and rehabilitation. It is in this area that we are able to save the species by focusing on the individual. By helping the individual, we can support the survival of the species.

In 2021, our on-site hospital and ICU enclosures and rooms were exceedingly busy, seen in the number of cases as reflected in the report below. Unfortunately, one of the effects of the Covid-19 pandemic was that funding necessary to further equip our hospital was placed on hold. Fortunately, we managed to secure funding to equip the surgery in 2022, and we will report on this in 2022. Table 1 below summarises the rescue and releases conducted by VulPro from 2010 to 2021.

Table 1. Summary of VulPro's rescue and release data from 2010 to 2021 for vultures and other birds.

SUMMARY OF THE RESCUE AND RELEASE DATA FROM 2010 TO 2021 FORVULTURES AND OTHER BIRDS													
		Years											
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Vultures	Rescued	30	39	58	46	72	75	73	108	120	93	81	84
	Released	13	15	31	24	15	21	16	72	48	40	17	50
	Success Rate	43%	38%	53%	52%	21%	28%	22%	67%	40%	43%	21%	60%
Other birds	Rescued	14	17	15	13	8	22	9	24	14	59	20	12
	Released	4	7	6	7	9	12	3	2	4	37	6	4
	Success Rate	29%	41%	40%	54%	100%	55%	33%	8%	29%	62%	30%	33%

Reasons for Admission

Once again, in 2021, we found that the greatest cause for admission was power line incidents. Unfortunately, despite our ongoing discussions with Eskom, we are still seeing power line incidents occurring. Of the 85 rescues that were conducted in 2021, 28 of them were power line rescues. There were also 12 admissions due to natural events. Last year, we saw some extreme weather events that caused birds to become grounded. There were also animal attacks and youngsters falling from the nest. Another significant reason for the admission of another 11 birds in 2021 was that the birds somehow managed to get trapped in buildings, residential gardens or fenced-off areas.

The remaining birds were involved in several incidents, including poisoning events (n = 6), starvation from a lack of food in the area (n = 5), and hard landings and collisions with fences (n = 3) (Table 2).

Table 2. Reasons for admissions to VulPro's rehabilitation programme in 2021.

REASONS FOR ADMISSION FOR ALL VULTURES RESCUED BY VULPRO IN 2021			
Reason For Admission	**Cape Vultures**	**African White-backed Vultures**	**Total Number ofVultures**
Collision – hard landing	1		1
Collision – fence	2		2
Power line collisions	24		24
Electrocutions	3	1	4
Poisoning	1	5	6
Starvation	5		5
Animal attack	3		3
Weather-related	7		7
Human interference	3	1	4
Trapped – buildings	2		2
Trapped – other	9		9
Fall from nest		2	2
Unknown	14	2	16
TOTAL	74	11	85

Currently, we have 266 permanent birds at VulPro that cannot be released. We have moved 42 to our satellite site at Bronkhorspruit to split the colony and spread the risk-avoiding the largest African vulture facility in the world collapsing due to an infectious disease. We collaborated with GHB Farms under the authorisation of the Gauteng Department of Agriculture, Conservation and Environment (GDACE) to develop this facility.

The chart below shows the threats, with their percentages, to the birds that have come into VulPro.

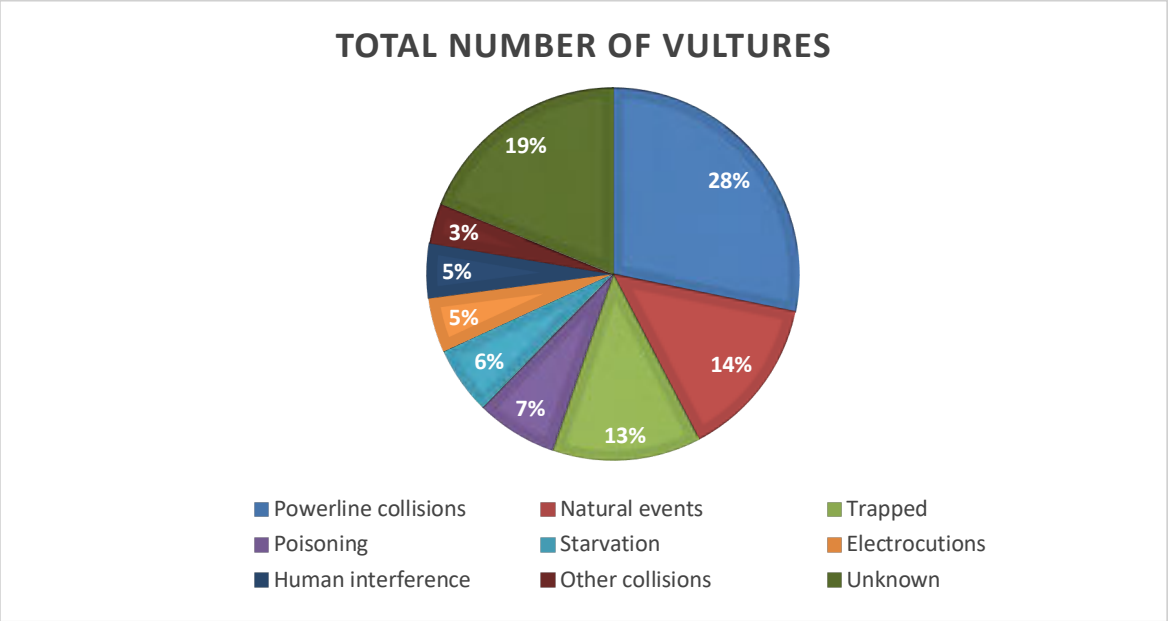

Figure 2. Threats to the birds that have come to VulPro.

Table 2 and Figure 1 above show that VulPro continues to rescue and collect large numbers of vultures needing a lifeline. Through our efforts, we can prevent their untimely death and can implement a breeding programme to save the species.

This year, we successfully released 50 rescued and rehabilitated birds (Table 1). At the end of 2021, we reflected on some of our releases over the years by putting together a map of some of the birds that have been released with trackers over the years. Figure 2 shows 11 of these birds as their devices are still active, including three species, Cape Vultures, African White-backed Vultures and a Lappet-faced Vulture. Their movement is tracked over the entire southern African subregion and beyond. This is always exciting for us to see, as it is tangible proof that the hard work we do is making an impact. We monitor our tracked birds daily and are always on the lookout for any trouble that might befall them in the future or for any signs that they are potentially nesting. We continue to track these birds, and we hope to see signs of birds pairing up and nesting in the future.

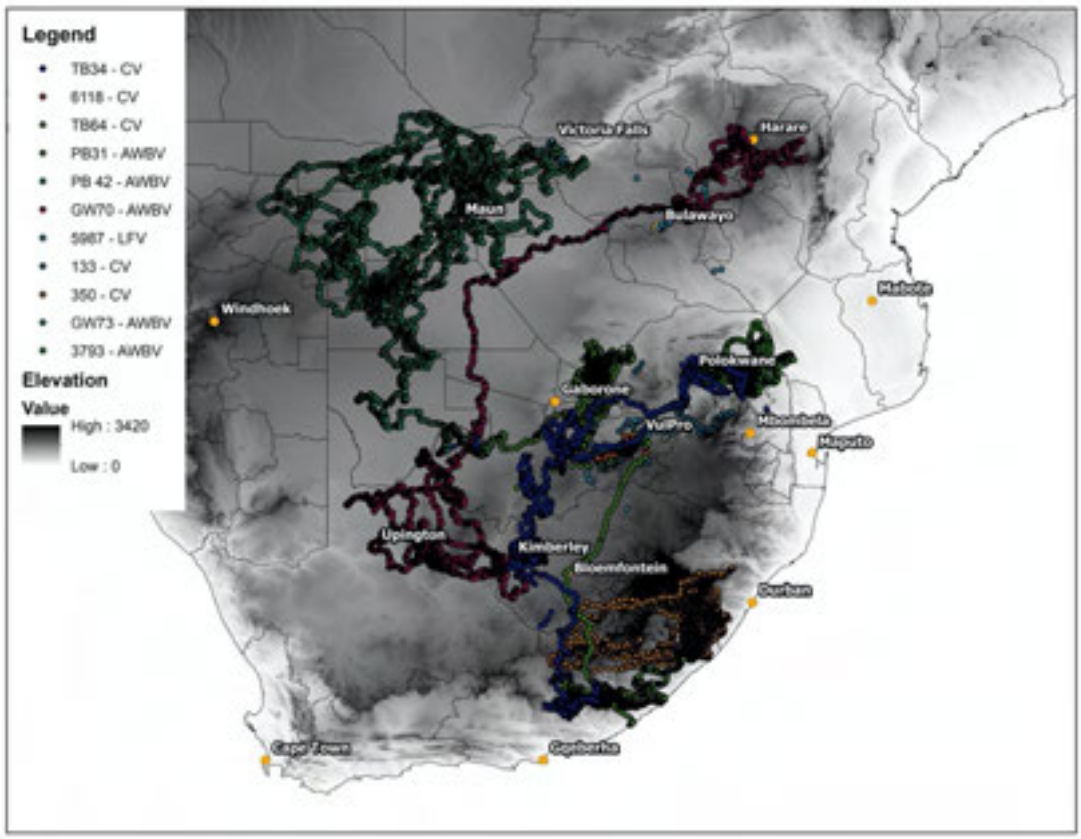

Figure 3. Movements across southern Africa during 2021 of current released rehabilitated vultures with active tracking devices.

Wild Breeding Surveys

Cape and African White-backed Vulture Breeding Surveys

In 2021, we monitored six Cape Vulture colonies across the northern parts of South Africa. A total of 1875 active nests were observed during the initial survey.

Our cliff monitoring focused on the northern parts of the Cape Vulture population, home to approximately 50% to 60% of the entire breeding population. There was a decrease in breeding pairs (Figure 2). The breeding success varied between ~57% and ~86% for Moletjie and Soutpansberg colonies, respectively (Figure 3).

Four African White-backed Vulture sites were surveyed this year with a breeding success rate of ~73%. The populations appear to be stable; however, specific properties showed signs of disturbance having an effect on the breeding success rate. The breeding success rate varied between ~57% and ~80% in 2021.

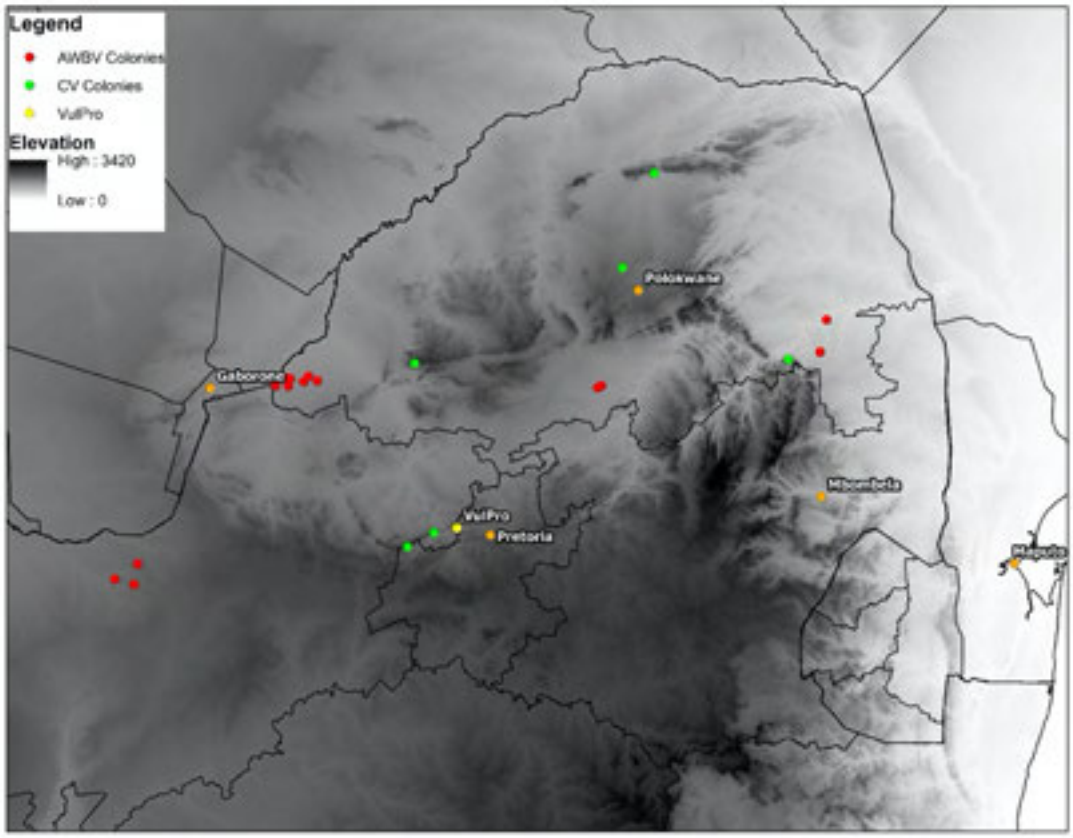

Figure 4. A visual representation of African White-backed (Red) and Cape Vulture (Green) breeding sites monitored by VulPro across southern Africa.

Survey Overview

Cape Vulture Breeding Surveys

Six Cape Vulture colonies across the northern parts of South Africa were monitored. A total of 1875 active nests were observed during the initial surveys, a reduction of active nests during 2021 compared to 2020, with each colony declining during their initial survey. It is not clear why there were

declines. They could be due to human disturbances or climatic conditions such as windy conditions observed at the Kransberg and Manutsa. We are particularly concerned about the Kransberg and Skeerpoort colonies, which declined by ~23% and ~29%, respectively.

We hope that the initial survey in 2022 will provide more information about whether the population is declining or just part of the annual variation. We will continue to monitor all the colonies closely. A total of 1438 fledglings were observed during the final survey this year, with an overall breeding success of 76.7% this year. The breeding success varied between ~57% and ~86% for Moletjie and Soutpansberg colonies, respectively. See Figure 4 for annual estimates of the number of breeding pairs at each Cape Colony Vulture and Figure 5 for breeding success rates.

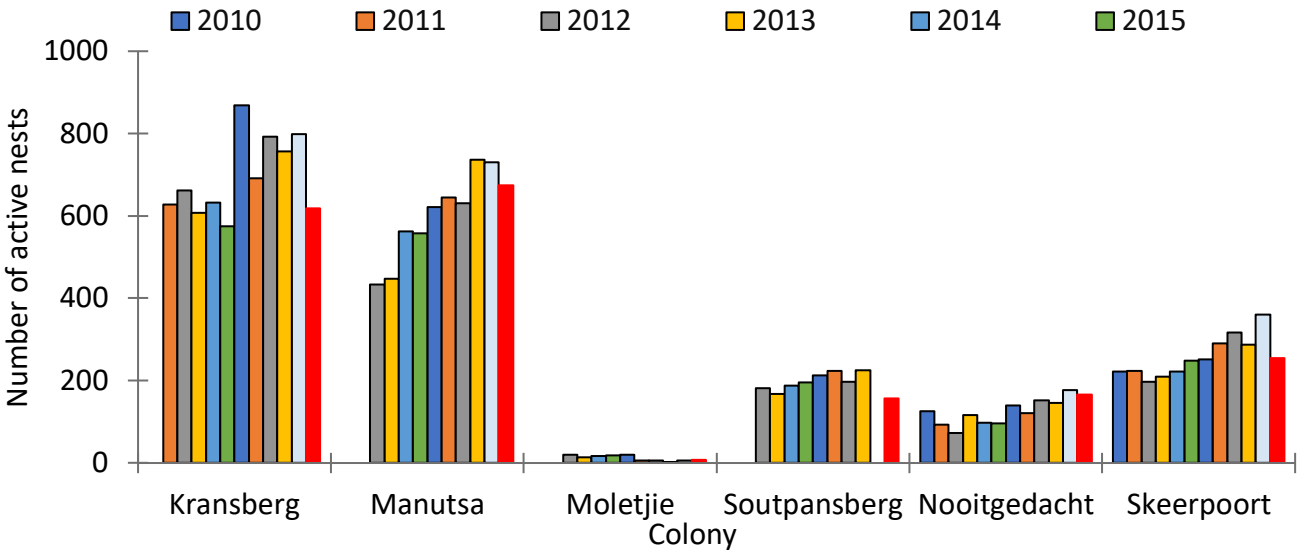

Figure 5. Annual estimates of the number of breeding pairs at each Cape Vulture colony monitored by VulPro in South Africa.

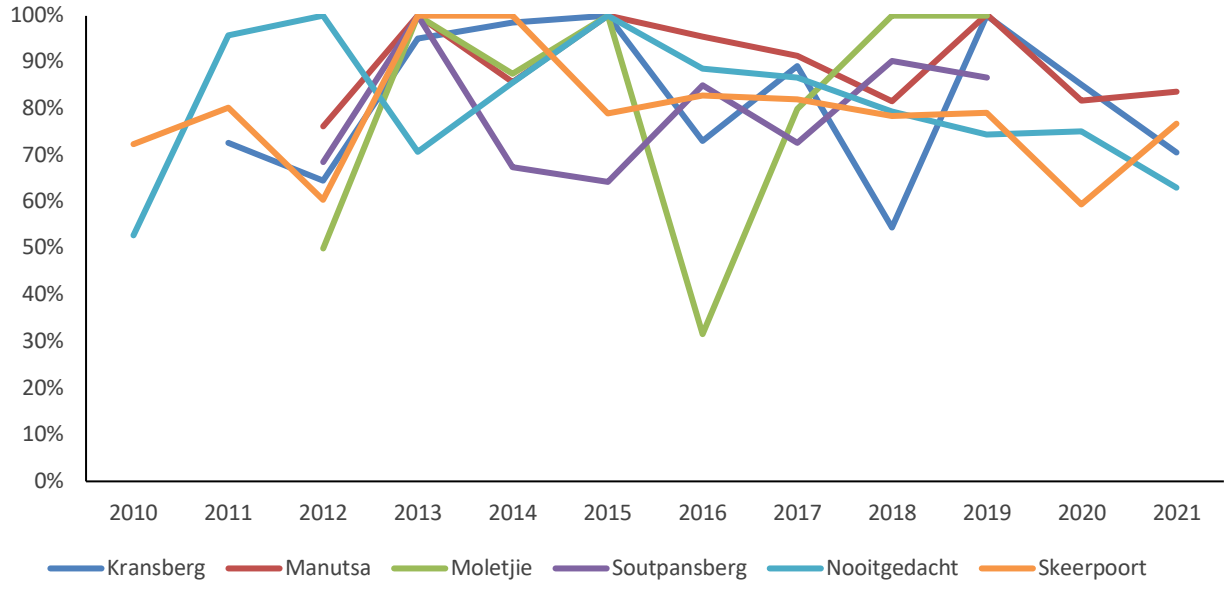

Figure 6. Annual breeding success at each Cape Vulture colony monitored by VulPro in South Africa.

Tree Nesting Vulture Surveys

We surveyed four tree nesting sites across southern Africa and recorded a total of 204 active nests during the initial survey and 149 fledglings during the second survey in October. This is an increase compared to the 2020 initial survey as we expanded our monitoring efforts. The overall breeding success was 73%, as certain sites experienced low breeding success. We suspect that a possible cause was due to farmers working on clearing bush encroachment during the breeding season. We hope to further expand our monitoring efforts at each site until we fully understand the population dynamics.

Figure 7. An adult African White-backed Vulture protects her nest.

Table 3. Survey results of the breeding success of African White-backed Vultures from five study sites in northern South Africa in 2021.

Location	Active nests (June/July 2021)	Active nests (Oct 2021)	Estimated breeding success 2021
Mareetsane	***105***	***73***	***70%***
Omega Game Ranch	62	54	87%
La Rancho	25	14	56%
Woodside Lodge	15	4	27%
Bakoven	3	1	33%
Dwaalboom	***76***	***61***	***80%***
Swartbos	22	18	82%
Rooiderbokvale	16	8	50%
Numzaan Safaris	12	10	83%
Unknown roadside	8	8	100%
Groenedal	7	6	86%
Boelani	4	4	100%
Laastepoort	2	2	100%
Nando	2	2	100%
Leeuwdoorn	1	1	100%
Loggerinde Hoek	1	1	100%
Dotreg	1	1	100%
Haakdorn	N/A	16	N/A
Kallie Lee Farm	N/A	1	N/A
Olifants River Private Game Reserve	***16***	***11***	***69%***
Roedtan	***7***	***4***	***57%***
Bosveld	4	3	75%
ASC Farm	3	1	25%
Total	**204**	**149**	**73%**

Figure 8. Obert Phiri and Ryno Kemp monitoring the Manutsa Cape Vulture breeding colony.

Captive Breeding Programme

Our captive breeding programme started almost a month earlier than previous years' egg-laying dates. Our captive birds produced a total number of 41 eggs: 34 Cape Vultures and 7 African White-backed vultures. Our egg fertility rate appeared to be very high, with only seven known infertile eggs.

Our 2021 captive breeding was a huge success, with 15 Cape Vultures, 1 African White-backed Vulture and our first Palm-nut Vulture produced by our resident non-releasable birds. This is an increase of 200% from last year's productivity, and we are excited to release these individuals in 2022. They will be able to contribute to their species survival by returning to the wild and replenishing what was lost due to the many threats these birds face daily.

Our supplementation programme has done exceptionally well throughout the year. By year end, all our 2020 captive-bred vultures were released successfully without any losses, indicating how well captive-bred vultures adapt to the wild. All the 2020 captive-bred fledglings released in the Eastern Cape of South Africa are spending most of their time within the Thomas River Valley, highlighting the importance of this area. Furthermore, Figure 6 highlights the importance of our captive breeding programme and the importance of the data collected by these birds. Preliminary analysis of our captive-bred birds showed they behave similarly to wild birds, exploring bigger areas during their first year (Yellow in Figure 6) and reducing their movement during their second year (red in Figure 6) as well as their fourth and fifth years (turquoise in Figure 6).

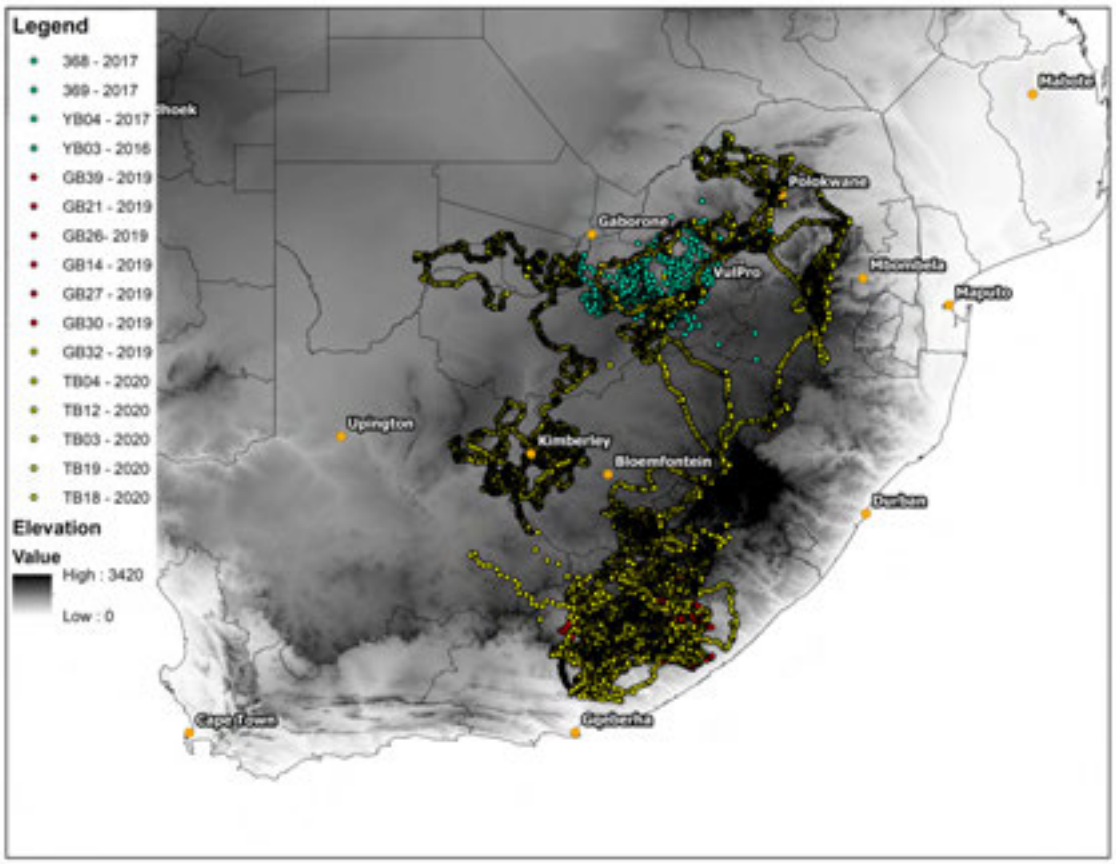

Figure 9. The movement behaviour during 2021 of 16 active captive-bred birds.

Summary Overview

Currently, we have released over 50 captive-bred vultures into the wild and almost 100 rehabilitated vultures over the past 15 years. There have been no failures from our released 2019 and 2020 captive-bred offspring. Our efforts have documented a 75% survival rate from our released rehabilitated vultures. We strive to continually improve our methods and aim to expand into other countries where vultures have become scarce or no longer breed.

Figures 10 and 10. Cape Vulture mother and chick and newly hatched Cape Vulture chick.

Powerline Surveys and Mitigation

As can be seen from the rehabilitation statistics above, power lines continue to play a destructive role in the decline of African vultures. These lines cause enormous damage to the birds either through collisions or electrocutions. If these incidents do not prove fatal, they cause permanent and irreparable damage to the birds. VulPro continues to work in collaboration with Eskom, South Africa's state utility provider, to find better ways to minimise these incidents.

In 2021, 52 power line incidents were reported to VulPro. Six of these incident reports have been closed, three reports require mitigation which has been approved, three reports still require investigation by Eskom or a recommendation letter to make appropriate mitigation suggestions, and one has been referred to Environtech. The remaining 39 reports are currently still open. We continue to work hard to speed the mitigations from Eskom along and ensure we can get appropriate mitigations in place as soon as possible.

Powerline Incidents

In 2021, 83 birds were involved in a total of 56 incidents. These incidents most often involved Cape Vultures (n = 59) and African White-backed vultures (n = 6). This year we were lucky enough not to have power line incidents for other vulture species. However, we encountered several other species, including Marabou Storks, Blue Cranes, Ring-necked Parakeets, Grey Go-Away-Birds (Grey Loerie) and Pied Crows. These figures are reflective of only reports submitted by VulPro. However, there are many more incidents like these that take place across the country. The hidden reality of power line incidents is that it is difficult to find all incidents across the country, and it is an unfortunate truth that these incidents are grossly underreported.

Table 4. The number of individuals per species involved in power line incidents reported by VulPro over the last four years.

THE NUMBER OF SPECIES AFFECTED BY POWER LINE INCIDENTS OVER FOUR YEARS				
Species	**2018**	**2019**	**2020**	**2021**
Cape Vultures	60	50	68	59
African White-backed Vultures	1	12	16	6
Lappet-faced Vultures	0	2	1	0
Other Species	1	13	28	18
Total	62	77	113	83

Table 5. The number of power line incidents reported by VulPro in 2021.

THE NUMBER OF POWER LINE INCIDENTS REPORTED BY VULPRO IN 2021	
Total number of incidents reported (some involved multiple birds)	56
Total number of incidents we received feedback on	13
Number incidents are pending for mitigation	3
Number of power line incidents closed (no further action)	6

VulPro continues to advocate for safe lines for vultures and other birds across southern Africa. As new energy types such as wind energy begin to gain popularity, we will continue to advocate for the appropriate use of this kind of energy. VulPro will engage with the relevant parties to ensure the implementation of such green technology is also done sustainably to ensure the safety of the birds and their continued existence.

We can only reiterate our dependence on farmers and landowners for reporting power line incidents

to VulPro. It is through their engagement that we can motivate for the appropriate mitigations to powerlines to be put in place – it is essential to ensure that all lines in vulture flight paths are mitigated to ensure the survival of the species.

Landowner Farmer Engagements

Vultures are victims of urbanisation and societal change. One of the ways to mitigate humankind's negative impact on the vultures, apart from community outreach, is to include farmers. Not only are they in areas where vultures are often found to be needing assistance, but farmers' effective livestock management has resulted in less dead stock for vultures to feed on. Farmers' practice of burying their dead animals has also led to a greater shortage of food supply for the vultures. Although bone abnormalities, believed to be due to calcium deficiency in their diets, also play a significant role in the high mortality rate of young birds.

VulPro continued with farmer and landowner engagement, extending the country's network of vulture conservationists. Farmers and landowners are vital to our efforts as they can establish vulture restaurants (or artificial feeding sites where safe food – carcasses – are placed, ensuring access to a reasonably constant supply of food). This becomes known as a supplementary feeding site for these birds. Farms are perfect locations for these restaurants as they tend to have open areas with few trees. Some farms are hilly, which allow the vultures to have access to thermals enabling them to rise because vultures are poor flyers, and the feeding site is not accessible to the general public. It is also possible for farmers to erect roosting structures. It is for these very reasons that VulPro is actively engaged with farmers to look at ways to encourage farmer involvement

While we continue to improve the number of active vulture restaurants at farms across South Africa, Christiaan Brink's study, *The impact of supplementary feeding sites on the breeding success of Cape Vultures,* underscores the importance of vulture restaurants for Cape Vulture breeding success.

We also use our vulture restaurants as part of our re-sightings programme, where we can observe vultures and their markers (patagial wing tags or coloured leg bands) to understand which individuals have moved and where they have moved. In 2021, 1 428 vulture re-sightings were reported to or recorded by VulPro. This information helps us understand the survival of the vultures and how they are moving.

Community Outreach, Interaction and Education

We were delighted that we could continue with our community outreach, interaction, and education programmes in 2021. We use these programmes to meet our long- and short-term objectives of preserving the species. By inspiring different generations and communicating our message, we demystify the myths andmisconceptions surrounding the vultures and inform, educate and instil respect and appreciation for the increasingly vital role these birds play in preserving the environment. We show how they prevent the spread of disease, especially given the changes wreaked by climate change. The vultures fight for survival depends on our collective efforts.

Every month in 2021, we were engaged in outreach and funding activities while ensuring the ongoing functioning of VulPro. We met with groups from SA Hunters and Conservationists to potential and current funders and visited potential sites as part of a possible expansion programme of our captive breeding programme in the Western Cape. We also met with film production crews. We strengthened our relationships with other NGOs, Eskom and looked at ways to enhance our funding requests.

We had numerous visitors to VulPro in Hartebeespoort who were interested in finding out more about vultures and visiting our hide, as well as a group of 50 people who attended a function at VulPro. With our strong belief in the importance of education and our desire to expand our message across the provinces, from time to time, we loan vultures out for educational purposes. Given the potential stress to the bird, we ensure the facilities we collaborate with meet our stringent requirements in terms of correct housing, management, ethics, and sound educational and awareness activities. Our outreach has been considerably extended by our loaning out two Cape Vultures (Pugsley and Wednesday) to the Cango Wildlife Trust in the Western Cape, with approximately 5 000 people visiting per month, and one Palm-nut Vulture to the Monte Casino Bird Gardens with around 6 000 people visiting per month. With these successes in mind, we have loaned out another two birds to Raptor Rescue Plett: a Black Vulture named Blackie, and a male Fish Eagle. The bird will be an ambassador in shows and tours at the Plettenburg Bay facility. Loaning out the vultures is not a step VulPro takes lightly, but given the extreme plight of these birds, it is a vital step in protecting and conserving the species.

We featured in various online and traditional media, including newspapers, TV programmes and radio shows. Furthermore, we engaged with 22 community members at the Collywobbles Colony in the Eastern Cape during our visit in March 2021. We gave talks to the Barbet Bird Club, the Cuckoo Bird Club and the Rotary Club: they all enjoy learning about vultures.

While there were still some strict lockdowns in 2021, we could extend our outreach through online discussions and presentations addressing students and researchers at the Michael Okpara University of Agri Mudike in Nigeria. We also managed an outreach programme in Zimbabwe, even presenting to a school. We also assisted Mokolodi Nature Reserve in Botswana with advice on their captive vultures and interacted with Nature Rwanda. Other international outreach included presenting to the Avian Medicine Club of Kansas State University.

Fortunately, we have increased our social media presence by holding more sessions online and have engaged in Facebook Q and A, Zoom talks and posting daily on Facebook, Twitter and Instagram and monitoring the traffic to our website. We have had 9 953 (9 772 in 2020) visitors to our website this year. We hope to grow our social media presence even more in the coming year. The VulPro Facebook page has increased by over 1 071 followers, from 15 181 followers in 2020 to 16 252 followers in 2021. Our Twitter account now has 1 817 followers, up from 1 682 in 2020, and 524 people follow us on Instagram. We had 2796 followers as at end July 2021 before we were hacked in August and had to restart our Instagram account. We now also have 130 YouTube subscribers on our newly upgraded YouTube channel. Table 8 below shows the number of people VulPro directly interacted with, educating and training them on vulture conservation in 2021.

Table 6. The number of people VulPro has educated and trained in 2021.

2021 OUTREACH AND TRAINING								
Measurable outcome	Volunteers	Tours	Talks	Schools & Educational Bodies	Staff Training	Adoptive Parents	Community Service	Total
Number of Events	10	~5 309	12	8	5	3	4	5 351
Number of People	17	~120 299	341	147	13	14	170	121 001

VulPro is particularly excited to have sold over 200 copies of our coffee table book, *Magnificent Vultures of Africa*, with its 72 pages of beautifully photographed vultures. Copies have gone all over the world. We hope to sell even more of the beautiful books to support our magnificent birds.

Noteworthy Events in 2021

In 2021, we were fortunate enough to receive a donation of a bone crusher from Barry Nortjie. It will help increase the calcium levels that the vultures will get at our restaurants and in captivity, enabling correct bone development and egg production.

We were very excited by the hatching of our first Palm-nut Vulture chick, which necessitated a supply chain supply from KwaZulu Natal coast for the Raffia palm nut. Thankfully, volunteers and DHL came to the rescue and ensured a steady supply.

As mentioned above, we welcomed a Lappet-faced Vulture and four Hooded Vultures from Detroit Zoo. It is envisaged that the four Hooded Vultures will form the founding breeding population.

VulPro has the first confirmed Cape/Ruppel's hybrid vulture in captivity worldwide. This bird came in from a power line electrocution which we rescued from the Eastern Cape. Hybrid vultures are extremely rare, and we are looking forward to finding out more about this bird.

Figures 11 and 12. Palm-nut chick and Palm-nut fledgling.

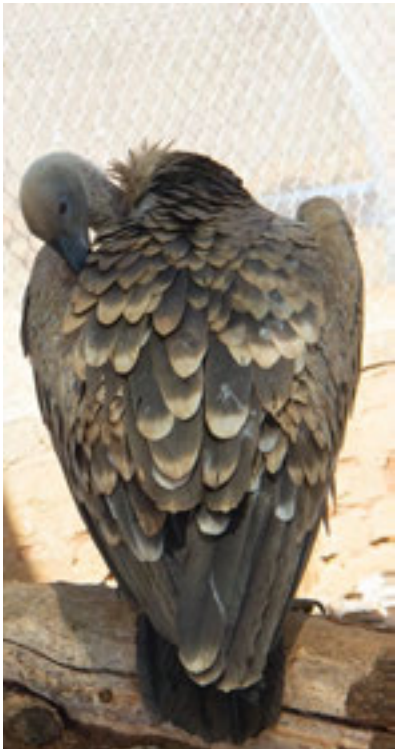

Figure 12. Cape/Ruppel's hybrid vulture.

Figure 13. Cape/Ruppel's hybrid vulture with Cape Vulture.

Research

The work we do at VulPro is strongly underpinned by our research which provides valuable insights into how we can increase the vulture population and what measures we can take to prevent the species from extinction. Our strong academic abilities and research have enabled us to develop strong relationships with other research organisations, amongst others, which all support African vultures.

In 2021, we could only publish two scientific articles and had to put certain publications on hold due to technical issues. However, we submitted another scientific paper, which is currently being peer-reviewed. Notwithstanding the low levels of publication, we had the most citations (177) since 2006, reflecting the importance of our work. Also, our work is reaching more people. We anticipate submitting another four publications during the first half of 2022.

In 2021, a new project began using VulPro's tree nesting data. Caroline Hannweg's PhD thesis *Using basic biology and remote sensing techniques to model habitat selection and the impact of current and future climates on the Critically Endangered African White-backed Vulture*. We are fortunate as this is a joint project between the Max Planck Institute and the University of Pretoria. We are particularly excited as the factors affecting vulture habitat selection, breeding and movement across the southern African subregion will be studied. It could potentially find new breeding sites. We will work in partnership with partners from across southern Africa.

VulPro embarked on a study of the movement behaviour and survival rate of Cape Vultures in the Western Cape. This vital and ground-breaking study aims to prevent collisions with renewable energy structures such as wind turbines by providing renewable energy developers with valuable information on the movement behaviour of vultures in and around the Overberg. We fitted nine tracking devices to nestlings in Potberg in September. In March 2022, we will fit another 11 tracking devices to adult vultures. We hope the information can be extrapolated to other studies related to renewable energy structures and current energy structures. We post the progress of our research in our quarterly reports and our social media platforms.

Figure 14. Vulture movement behaviour study in the Western Cape.

Publications

Furthermore, two publications have been submitted for publication, with another three to be submitted in early 2022 and another eight in preparation.

Published

1.) Curk T., Scacco M., Safi, K., Wikelski M., Fiedler W., **Kemp R.** and **Wolter K.,** 2021. Wing tags severely impair movement in African Cape Vultures. *Animal Biotelemetry*, *9*(1), pp.1–13.
2.) Galligan T.H., Green R.E., **Wolter, K.,** Taggart M.A., Duncan N., Mallord J.W., Alderson D., Li, Y. and **Naidoo, V**., 2022. The non-steroidal anti-inflammatory drug nimesulide kills Gyps vultures at concentrations found in the muscle of treated cattle. *Science of The Total Environment*, *807*, p.150788.

Publications Submitted:

1. Aspenström S, **Kemp R**, Howard A, **Hannweg, CG**, Chetty K, Briers RA & **Wolter K**. (submitted) The threat of power lines on two African Vulture species. Biodiversity and Conservation.
2. Bromfield, M., Webster, K., **Hannweg, CG**., **Kemp, R**. & **Wolter, K.** (submitted) A GIS investigation of terrain and topographic characteristics at Cape Vulture (Gyps coprotheres) power line hotspots within the Eastern Cape, South Africa. South African Geographical Journal.
3. Kane A, Monadjem A, Bildstein K, Botha A, Bracebridge C, Buechley ER, Buij R, Davies JP, Diekmann M, Downs C, Farwig N, Galligan T, Kaltenecker G, Kelly C, Kemp R, Kolberg H, MacKenzie M, Mendelsohn J, Mgumba M, Nathan R, Nicholas A, Ogada D, Pfeiffer MB, Phipps WL, Pretorius M, Rösner S, Schabo DG, Spiegel O, Thompson LJ, Venter JA, Virani M, **Wolter K**, Kendall C (Submitted) Size doesn't matter; it's how you use it: Using continent-wide variation in ranging behaviour of vultures to assess the feasibility of Vulture Safe Zones in Africa. Biology Conservation.

Publication in Prep:

1. **Sibanda, B., Kemp, R., Hannweg, CG**. & **Wolter, K**. Movement behaviour and habitat requirements of a breeding White-headed Vulture.
2. Aspenström S., **Kemp R.**, **Howard A.**, **Hannweg, C.G.**, Chetty K., Briers R.A. & **Wolter K**. (*In Prep*) The threat of power lines on two African Vulture species.
3. Casey, J., **Kemp, R.**, **Hannweg, C.G**., **Hirschauer M.T., Naidoo, V.** & **Wolter, K.** (*In Prep*) Lead poisoning may not contribute to power line collisions amongst African Vultures.
4. Cervantes F., Murgatroyd M., Allan D., **Kemp R.,** Kruger S., Maude G., Mendelsohn J., Rosner S., Schabo D.G., Tate G., **Wolter K.** and Amar A. (*In Prep*) A partially explicit collision risk model for the Endangered Cape Vulture to guide wind energy development.
5. Brink C.W., Zimunya T., **Kemp R., Wolter K.** and Thomson R. (*In Prep*). The effect of supplementary feeding on breeding success in the Endangered Cape Vulture, *Gyps coprotheres*.
6. MacLeod N., **Kemp R., Hannweg CG., Wolter K.,** Warren B. and Keith Mark. (*In Prep*) Examining the foraging ranges and behaviours of two African vultures in Gauteng and North-West Provinces of South Africa.
7. Hirschauer M.T., **Hannweg C.G**., **Kemp R**. and **Wolter K.** (*In Prep*) VulPro: An overview of Africa's Vulture Conservation Centre.

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Administrative

Board, Staff, Volunteers, Students

Keri Wolter, the CEO of VulPro, has run VulPro as an independent not for profit organisation since 2011. With the support of the Chairman, members of the board and staff, Kerri ensures the organisation's ongoing viability and the delivery of its mandate to safeguard the vulture species' survival.

VulPro would like to thank the board for its continued guidance and invaluable support. The members of the board and their roles are listed in Table 9.

Table 7. The VulPro board 2021.

BOARD MEMBERS		
Name	Role	Board member since
Prof. Vinny Naidoo	Chair and Research	2013
Magda Kets	Legal Advisor	2019
Robyn Howes	HR and Marketing	2014
Craig Nattrass	Operations	2017
Kerri Wolter	CEO	2011

Staff

Without a doubt, VulPro would not be where it is without the dedication of its staff members, listed in Table 10 below.

Table 8. VulPro staff 2021.

The VulPro Staff 2021		
Name	**Role**	**Status**
Kerri Wolter	CEO	Permanent*
Obert Phiri	Operations Manager	Permanent*
Notice Phiri	Driver and Maintenance	Permanent*
Charles Banda	Maintenance Manager	Permanent*
Esther Mopope	Domestic Affairs	Permanent*
Caroline Hannweg	General Assistant	Permanent*
Ryno Kemp	Head of Research	Permanent*
Clarence Mabasa	Student	Temporary
Bhekinkosi Sibanda	Student	Temporary
Kate Webster	Eastern Cape Representative and Fieldwork	Permanent
* Salaried		

Volunteers and Students

Our volunteers are vital to the VulPro's success. They often rescue birds on the brink of death and bring them back to VulPro, where we are sometimes able to save them. Our volunteers go out sometimes more than once a week, travelling great distances to get to the birds and bring them back. We would not be able to do our work and save so many vultures if it were not for our volunteers.

We would like to thank our volunteers, the people and the organisations worldwide who have assisted the vultures and VulPro in times of difficulty.

Figure 15. At the restaurant.

Travel

Travel is a part of VulPro's daily activities as we work throughout several provinces in South Africa. In 2021, we not only worked within our country's confines, but we also made regular visits to our neighbouring countries such as Botswana and Zimbabwe. Reasons for travel include:

- Carcass collection for feeding purposes
- Rescue and rehabilitation efforts
- Management, supervision and visits to vulture restaurants
- Operation of the release site enclosure at Nooitgedacht
- Required travel to undertake research projects and fieldwork activities
- Training and education
- Talks and presentations
- Transportation of critical birds for veterinary services
- Vehicle service and maintenance

Financials

Fundraising and Sponsors

VulPro is a not-for-profit organisation. This means that we are dependent on the support of donors and sponsors to continue our work and keep the vulture species alive. Ninety per cent of our funding comes from abroad, and a large percentage from zoological facilities in the USA and the UK. Through this ongoing support and the support of the individuals within these organisations, we can continue to achieve our goals, conserving and stabilising vulture populations across southern Africa.

We are incredibly grateful for the continued commitment of our friends, sponsors, donors, ‘adoptive parents’, family members, volunteers and supporters during the difficult times brought about by the Covid-19 pandemic. Thank you for helping us to achieve our goals.

In particular, we would like to highlight the contributions made by our sponsors listed overleaf. We would like to highlight the support provided by Designline Graphics for the design of our website and its maintenance.

Figure 16. African White-backed Vulture.

Abraham Foundation
Blair Drummond Safari Park
Cellular Tracking Technologies
Cincinnati Zoo & Botanical Garden
Cheyenne Mountain Zoo
Dallas Zoo
Darwin Chambers
Detroit Zoological Society
DHL
Fondation Ensemble
Fort Wayne Children's Zoo
Fresno Chaffee Zoo
GH Braak Trust
Greenville Zoo
Hans Hoheisen Charitable Trust
Holtzman Wildlife Foundation
Idea Wild
International Association of Avian Trainers and Educators
Jacksonville Zoo and Gardens
Little Rock Zoo
Loch Lomond Bird of Prey Centre
Lomas Wildlife Protection
Lush
Max-Planck-Gesellschaft
Nashville Zoo
National Aviary Pittsburgh
National Centre for Birds of Prey Centre
Nashville Zoo
Natural Encounters Conservation Fund Inc
Riverbanks Zoo
Omaha Zoo
San Diego Zoo Wildlife Alliance
St. Augustine Alligator Farm Zoological Park
The Tusk Trust
Wilhelma Zoologisch-Botanischer Garten, Stuttgart

We are also very grateful to those who have chosen VulPro as their selected charity through Woolworths's MySchool/MyVillage/MyPlanet programme. This programme enables our supporters to help us at no monetary cost to themselves. The programme raises money for schools, charities and conservation projects such as ours in South Africa.

Risk Strategy

VulPro has successfully maintained an investment asset to help manage the cash flow challenging times, such as the one we have all experienced over the last two years. We have continued with our strict expense controls, planning and, in some cases, expense cuts. These measures have prevented us from using our reserves to fund activities. The funds continue to be monitored and invested at a conservative rate and have provided a modest return on investment during the turbulent markets. (The audited financials are available on request.)

VulPro Sustainability

As an organisation dedicated to preserving vultures, VulPro's reason for being is sustainability. However, the sustainability of the species is dependent on our sustainability as an organisation and, as such, we have put measures in place to secure the future of VulPro for years to come. These measures include employing suitable and committed staff and a competent board of directors to govern the organisation and adhere to sound and good corporate governance practices in South Africa. It is envisaged that our investment account will partially cover our daily running costs in the long-term, if necessary.

VulPro recognises that vultures are a benefit to all global citizens, today and tomorrow. With this in mind, we are increasing our outreach far beyond our borders, informing many countries about the importance and relevance of vultures. This outreach has helped us build on a loyal and healthy global sponsorship base: a massive contributing factor in VulPro's future and the sustainability of the species.