CAPE VULTURE VALUATION

16 November 2022

South Africa

Total Conservation Value: ZAR 511,166,523

Table of Contents

This report has been prepared by Endangered Wildlife OÜ on behalf of Vulpro as an assessment of the financial value of Cape Vultures in South Africa.

Cape Vulture Overview

The Cape Vulture (*Gyps coprotheres*) is one of 23 global vulture species. The species is only distributed in limited regions of Southern Africa and, based on the 2021 IUCN assessment, is facing decreasing population trends. The population was first assessed as Threatened in 1988 before being labelled Vulnerable in 1994. In 2015, it was raised to Endangered but has now been reversed back to Vulnerable following the 2021 assessment.

Cape Vulture Population Distribution

Source: IUCN

Although the status has improved, the declining population trend remains of particular concern with a global estimated number of mature adults according to the IUCN ranging from 9,600 to 12,800. This is due to the ecosystem role that the vultures play. Vultures are one of the key scavengers that help clear carcasses and effectively remove potential pathogens from the environment. Such a function is vital for both other species but also for human health and welfare.

As a demonstration of the healthcare impact, in India the use of diclodenac caused the mass poisoning of vultures. Feral dogs assumed the role of the scavenger, which resulted in an explosion of diseases including rabies. According to David Allan of the Durban Natural Science Museum, the resulting cost to the Indian public health system from 1993 to 2006 was estimated to be around ZAR 590bn (equivalent to over ZAR 40bn per annum).

In spite of the significant service that vultures perform for human society, they are facing significant threats. They are erroneously believed to prey on livestock, and are also poisoned. Additionally, the vultures are used for traditional medicine, which has resulted in a significant number of vultures being poached.

According to a study published in the Journal of Raptor Research by Mbali Mashele *et al.* (2021), traditional healers use vulture body parts for clairvoyance, good dreams, increased intelligence, as a treatment against illnesses, and as a form of appeasement to ancestors.

Cape Vultures: Broad Threat Categories and Assessments

Threat	Stress	Scope	Impact score
Renewable energy	Species	Majority (50-90%)	Medium Impact: 7
Utility & service lines	Species	Majority (50-90%)	Medium Impact: 7
Intentional use	Species	Majority (50-90%)	Medium Impact: 7
Unintentional effects	Species	Majority (50-90%)	Medium Impact: 7
Persecution/control	Species	Minority (<50%)	Medium Impact: 6
Recreational activities	Species	Minority (<50%)	Low Impact: 5
Other ecosystem modifications	Ecosystem	Minority (<50%)	Low Impact: 5
Habitat shifting & alteration	Ecosystem	Minority (<50%)	Unknown

Source: IUCN

While the Mbali Mashele *et al.* (2021) study is not specific to the Cape Vulture, it explains that, in general, vultures are poisoned and trapped in both communal rangelands and from protected areas. These include the Kruger National Park, Sabi Sands Game Reserve, and Bushbuckridge Nature Reserve. The value of the vultures for traditional medicine ranged from ZAR 300 to ZAR 1,500 for the entire bird, and approximately 400 to 800 vultures are used annually by the Kukula Traditional Health Practitioners Association from the Mpumalanga Province alone.

An earlier study by Mckean *et al*. (2014) estimated that, in eastern South Africa, c.a. 160 vultures are sold annually, equivalent to 59,000 products. These sales are worth around ZAR 1.2m annually (or ZAR 7,500 per vulture) for the end consumer. The paper indicates that, in eastern South Africa, there are around 1,250 traders, hunters and traditional healers who target vultures.

Considering the size of the South African vulture populations (not only the Cape Vulture populations) and the poor breeding success, the current levels of vulture trade is unsustainable. The paper surmises that there will be insufficient vultures to support the trade within 15 to 30 years.

It is even estimated that, at current harvest levels, Cape Vultures could become locally extinct in the Eastern Cape, KwaZulu-Natal and Lesotho within the next 44-53 years. According to studies such as McKean and Botha (2007), if the White-backed Vulture (*Gyps africanus*) population is depleted, the pressure on the Cape Vulture will result in a catastrophic population event within 12 years.

As such, although Cape Vultures were recently classified as Vulnerable, they continue to face a high risk of extinction in the wild due to this targeted harvesting.

In addition to the threat of poaching, according to the IUCN there are more than 10 additional specific known or suspected causes for Cape Vulture mortality. These include, but are not limited to:

- A decrease in availability of carrion, especially during chick-rearing;
- Inadvertent poisoning and food contamination;
- Electrocution on pylons or cable collisions;
- Loss of foraging habitat;
- Bush encroachment; and
- Drowning.

However, while vultures are not high on the agenda, there are some conservation strategies in place. For example the vulture restaurants, where the birds receive supplementary feeding, have helped to reduce the declines in the populations and have even helped to recolonise former colonies. The supplementary feeding has also contributed to increasing the survival rate of first-year birds in the Western Cape, and increasing the number of breeding pairs in Mzimkhulu and southern Kwa-Zulu Natal (Schabo *et al*., 2017).

Vulpro

Vulpro is one of the few conservation organisations working towards supporting the long-term survival of the Cape Vulture. Vulpro accepts non-releasable vultures that are rehabilitated and integrated into the ex-situ population that are used to breed individuals for release. This forms part of the organisation's captive breeding and rewilding programme. The released birds are fitted with GPS transmitters and the data collected from the transmitters are used for the vulture research programmes and population monitoring.

The organisation has also been involved with educational programmes, landowner engagements and raising awareness about the plight of the vultures. Additionally, the information is used to regularly assess the anthropomorphic changes to developments in the environment, and to develop new mitigation strategies.

Vulpro also organises veterinary care for vultures, and houses over 265 vultures, most of which cannot be released.

Cape Vulture Valuation Summary

Carbon Value: ZAR 7.1m

Carbon Value is defined as the value of the CO_2e that is not emitted into the atmosphere by carcasses that are consumed by the Cape Vulture over a 30-year period.

Source: Ecosystem Service, Scientific American, Carbon Credits, Raptor TAG, Endangered Wildlife OÜ

Aesthetic Value: ZAR 109.6m

Aesthetic Value is the value created by biodiversity through the beauty and quality of life created by the species and environment. It is calculated as the maximum price a person is willing to pay to see the species, plus the price a person is willing to pay for a product related to the species on e-commerce platforms.

Source: Ecommerce and social media data processed through Endangered Wildlife OÜ's internal algorithms

Economic Value: ZAR 376.2m

Economic Value is defined as the value that is created by biodiversity through their contribution directly to the economy, taking into consideration up to 28 different economic sectors.

Source: Multiple peer-reviews articles, governmental and tourism websites, statistical departments, Endangered Wildlife OÜ's internal algorithms

Hedge Value: ZAR 1.4m

Hedge Value is a statistically-driven financial value that a stakeholder would be willing to pay to maintain a population between the Minimum Viable Population and the Carrying Capacity. It represents an "insurance" against exposure to changes in the population sizes.

Source: Multiple peer-reviewed articles, Endangered Wildlife OÜ's internal algorithms based on the Black Scholes Pricing Model

Impact Value: ZAR 16.8m

Impact Value is the added value that is created by increasing the population sustainably through active conservation or species management taking into account management, ecosystem and exogenous factors.

Source: Multiple peer-reviewed articles, Endangered Wildlife OÜ's internal algorithms

Total Conservation Value: ZAR 511.2m

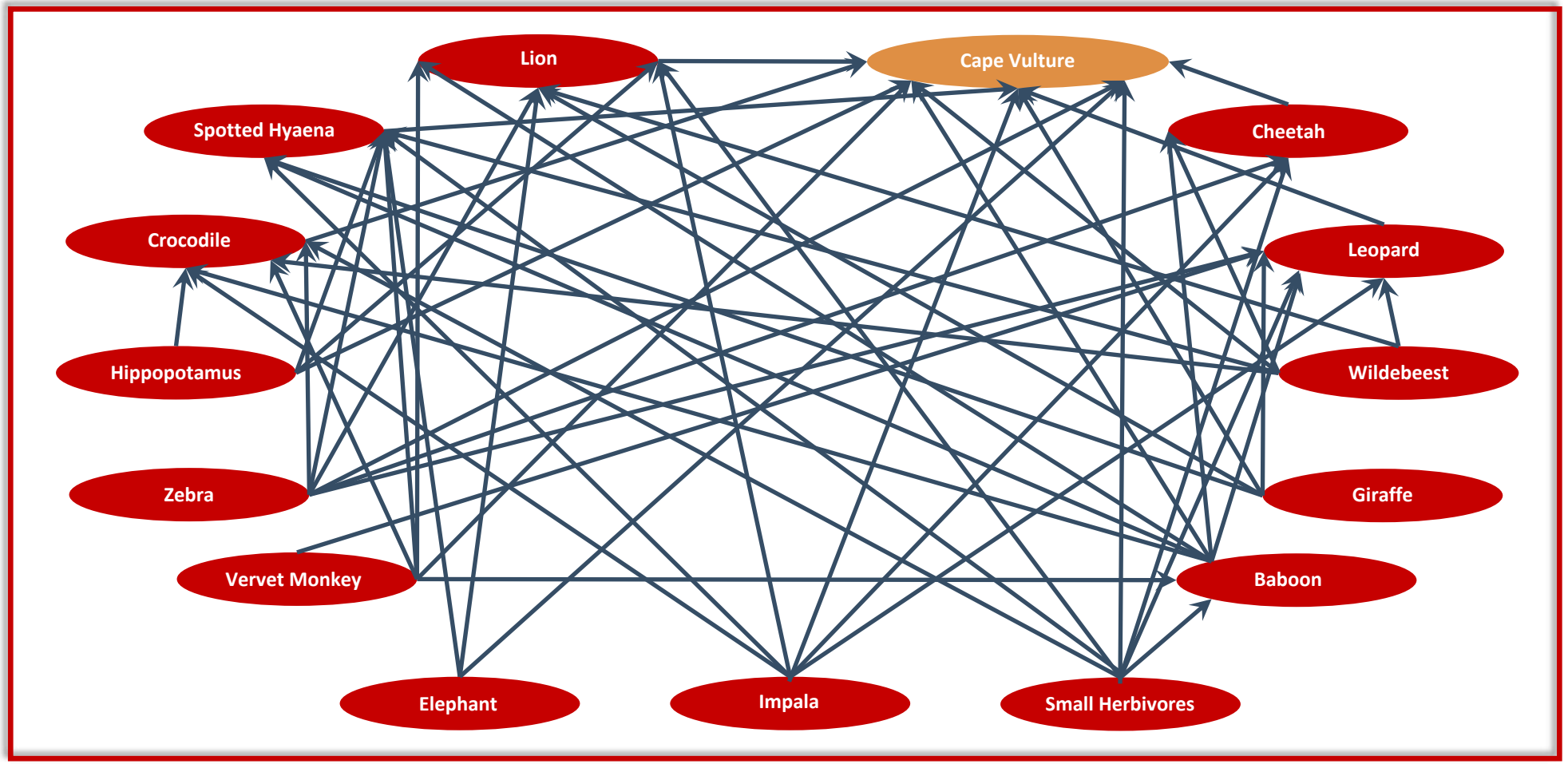
Total Conservation Value is the sum of (i) Species Existence Value and (ii) Impact Value. It represents the total value created by the species population when it is sustainably and actively protected and managed.

Source: Endangered Wildlife OÜ's internal algorithms

Note: The calculated values represent the values that the South African Cape Vulture contributes to society, the economy and the environment over a 30-year period. The valuation period is defined as 30 years to represent the value created during one human generation and is standardised for the Endangered Wildlife OÜ valuation methodology so as to allow for comparability across species population groups.

Cape Vulture Valuation: South Africa

For this report, the South African Cape Vulture population is valued against its carbon, aesthetic, economic, hedge and impact values relative to its local food web interactions.



The Relationship Network depicted represents an example of a local food web for the Cape Vulture resident in South Africa and other species that co-habitat the region.

This includes competitors, predators, food sources and other key interactions present in the region.

The relationship matrix is vital in understanding the importance of the Cape Vulture relative to other species and to the environment.

The food web is based on a variety of documents and studies of key species' interactions in the target region.

Cape Vulture Population Modelling

Population modelling is one of the fundamental processes for valuing biodiversity. This requires an understanding of the population dynamics.

It is estimated that there are only 15,980 Cape Vulture individuals left in South Africa. In order to assess and simulate the past recorded population trends, the following sources were considered:

- Cervantes *et al.* (in press) and survey data provided by Vulpro;
- Trend data from the Kransberg Cape Vulture colony and information reported by Benson and McClure (2020) and by BirdLife International (2021);
- Trend data to 2003 as reported in Ogada *et al*. (2016);
- The northern population growth rates as reported by Hirschauer *et al*. (2021); and
- The rates of decline as per the Red List Assessment of the species (BirdLife International 2021).

The population trends of the species in the Cape Vulture Relationship Network were simulated using verified geo-referenced occurrence data. This is a well-established modelling technique that has been successfully applied by researchers, including Kery *et al.* (2010), Isaac *et al*. (2014), Horns *et al*. (2018), Boersch-Supan and Robinson (2021), and Hertzog *et al.* (2021).

A baseline model, which was developed to determine the outlook for the species, was built taking into account traits such as biology, life history characteristics, demographics, population dynamics, and connectivity. Additionally, other factors such as poisoning, poaching, electrocution from powerlines and the emerging threat of wind farms were accounted for. The key parameters in the model included:

- Cape Vultures are known to form long-term monogamous partnerships. The maturity age ranges between five and seven years (Monadjem *et al.* 2004; Pfeiffer 2016), with the most frequently reported age being five years.
- Mature individuals can successfully breed for the duration of their lifespan. The average lifespan for the species is 30 years.
- Females lay one egg (rarely two) (Robertson 1986) once a year or every second year (Pfeiffer 2016).
- The age-specific mortality rates were based on research by Robertson (1986). The respective mortality rates vary from 40% for chicks, to 15% for juveniles and sub-adults, to 8% for the adults.
- The model incorporates reduced genetic diversity as per Kleinhans and Willows-Munro (2019).
- The simulation ran for a time period of 30 years, equivalent to one human generation.

Baseline Scenario

The baseline scenario used the initial population of 15,980 individuals as a starting point. The model forecasted a slowly shrinking population, which is likely to decline to 14,310 individuals in 30 years. This trend corresponds with Hirschauer *et al.* (2021) and the Red List Assessment of the species (BirdLife International 2021).

Carrying Capacity Scenario

The Carrying Capacity was calculated based on the current population size and the extent to which the population has declined based on the results of multiple authors. The calculated Carrying Capacity was 31,300 individuals, and the scenario resulted in a steep increase in the Cape Vulture population to 30,368 individuals in 30 years.

Minimum Viable Population Scenario

The Minimum Viable Population requires a 1% or lower population extinction probability within 30 years, and a genetic diversity of 0.9 or higher. The calculated Minimum Viable Population for the Cape Vulture is 80 individuals.

Conservation Scenario

The Conservation Scenario took into consideration the ongoing Cape Vulture conservation efforts and the resulting increase in the population sizes of largest South African colonies. The model assumed that the conservation activities will continue to increase the reproductive success and chick survival rate. Under this scenario, the model forecasted that there would be an increase in the Cape Vulture population to 21,467 individuals in 30 years.

Carbon Value

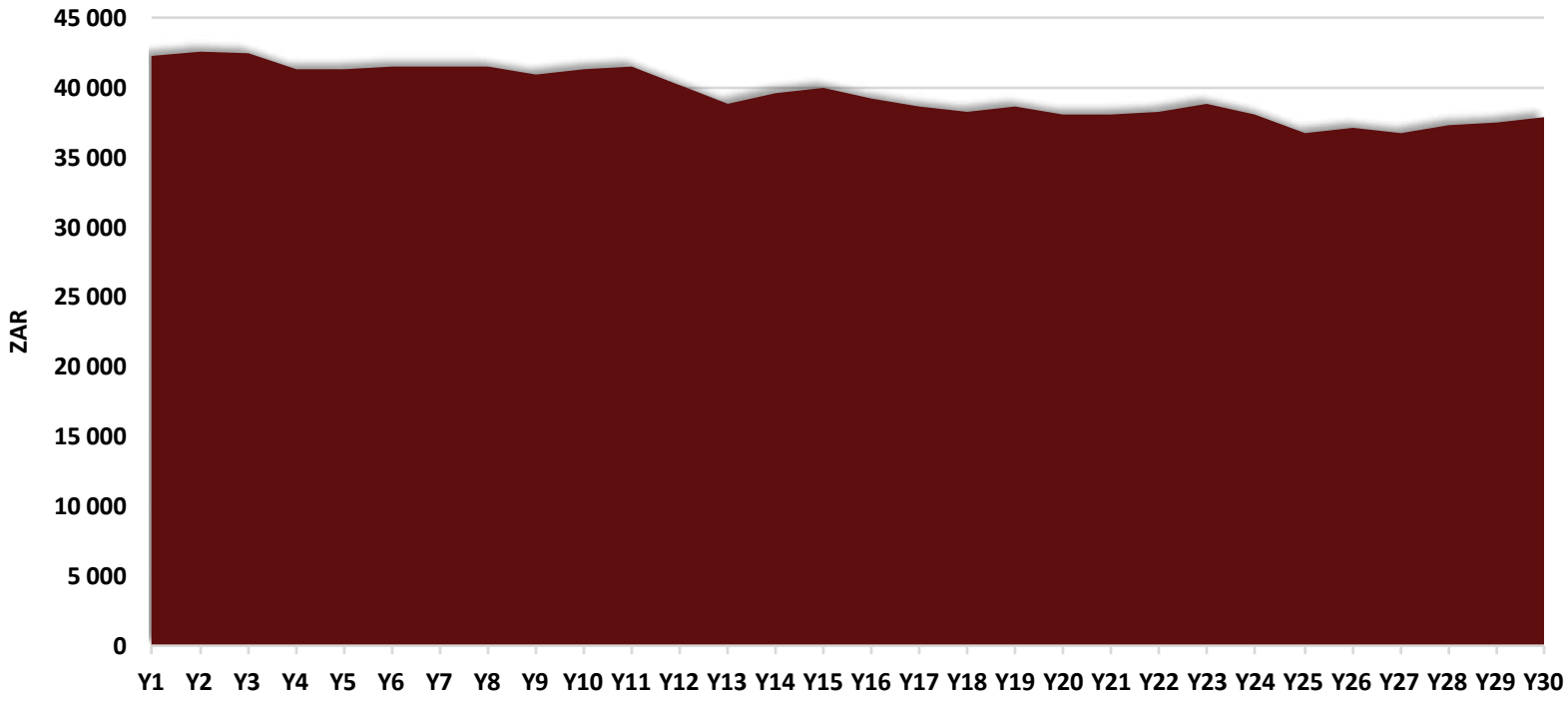
According to a recent study in *Ecosystem Services* and *Scientific American*, vultures contribute towards reducing the release of greenhouse gases. This is due to the fact that vultures consume carcasses that would otherwise release carbon dioxide and methane into the atmosphere. The article explains that, on average, a carcass releases 0.86 $kgCO^2e$ per 1 kg weight.

A Cape Vulture on average weighs 9 kg and eats approximately 6% of its body weight daily. Based on these averages, a Cape Vulture annually consumes around 197.1 kg per year.

That would imply that a single vulture removes around 195.5 $kgCO^2e$ per year. According to the VERRA Voluntary Nature Based Offset market price of over ZAR 90 (as of 11 November 2022), this means that each Cape Vulture, on average, has an annual carbon value of around ZAR 15.64.

While this may not seem like a significant value, this is only for one vulture in one year. Assuming that the vulture population develops as described in the Base Case Scenario in the Cape Vulture Population Modelling section, the Carbon Value of the population over a 30-year period at the current market price is worth a total value of ZAR 7.1m.

Annual Carbon Value Based on the Current Voluntary Nature Based Offset Price



Source: Endangered Wildlife OÜ

Aesthetic Value

The Aesthetic Value for the Cape Vulture population is calculated by summing the Willingness to Pay with the Virtual Willingness to Pay.

The Willingness to Pay is defined by the consumer surplus per visit to a defined location and uses social media as a proxy. Geotagged data that is extracted for South Africa is used.

For each data point, the home location of users is determined based on the lowest possible administrative level. This allows for the calculation of actual direct travel cost to the target location, and the opportunity cost of travel. This data is used to run a truncated Poisson regression, which calculates the willingness to pay per individual visitor.

The value is calculated relative to the total number of visitors to the region and the weighted expressed interest in the Cape Vulture population.

The Virtual Willingness to Pay reflects the role that social media plays in driving an interest in vultures. It is therefore calculated on the price a person who is willing to pay online to purchase a vulture-related product, including toys, books and DVDs. This is regardless of whether or not they are able to travel to see vultures.

This Virtual Willingness to Pay is based on the average price of products related to the vulture that are listed on e-commerce websites. In order to estimate the demand for these products, relevant influencers on major social media photo and video sharing platforms are identified based on the number of followers. It is assumed that, if these influencers promote vultures regularly, then they have the ability to influence their followers to purchase related products.

Depending on the social platform, there are standard average click-through and conversion rates that can be applied to influencer-driven purchasing habits. As such, the e-commerce value is then calculated relative to the average price of products applied to the average number of daily posts per platform, the average platform click-through and conversion rates, and the local Cape Vulture's population size of 15,980 relative to the global Cape Vulture population size of 17,000.

Aesthetic Value	
Willingness to Pay (WTP)	ZAR 101,887,015
… Average WTP per individual	ZAR 24,002
… Number of Cape Vulture-specific visitors	4,245
Virtual Willingness to Pay (VWTP)	ZAR 7,714,467
… Global VWTP	ZAR 8,206,876
… Local Cape Vulture population size	15,980
Total Aesthetic Value	**ZAR 109,601,481**
Source: Endangered Wildlife OÜ	

Economic Value

The Cape Vulture's Economic Value comprises of two parts:

- 12 economic and investment categories; and
- The dependency of the local tourism industry relative to the size of the Cape Vulture population.

The Economic Values are calculated using a unique, adapted version of a discounted cash flow valuation model. The dependency model is then based on a relationship statistical model that assesses the degree to which the value of tourism industry will be affected by a change in the probability of the target species population size.

In addition, the valuation also takes into account the local South African economy, including interest and inflation rates.

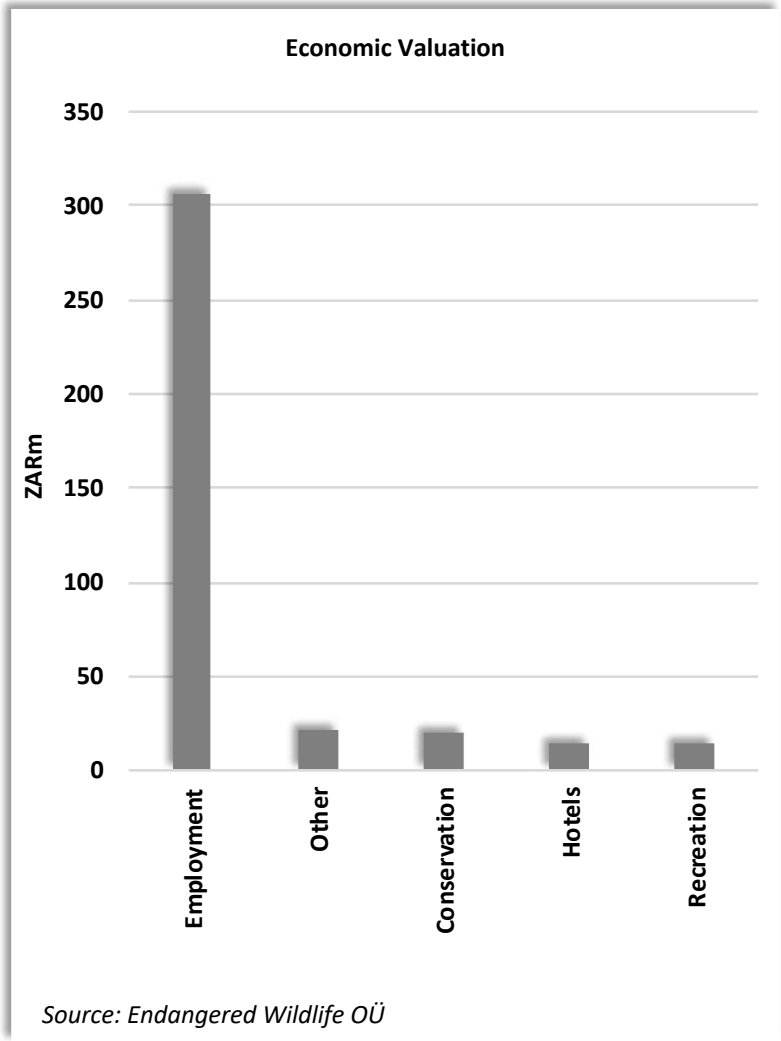
Besides employment, the greatest economic value that is generated by the Cape Vulture population is currently tourism-related value. In total, the estimated present value of tourism created by the vultures is ZAR 34.2m. This can be divided into four main parts:

- Hotel income: ZAR 14.4m
- Recreation income: ZAR 13.7m
- Restaurant income: ZAR 5.2m
- Retail income: ZAR 0.9m

The main value created by the Cape Vultures, though, is direct and indirect employment. Besides the direct conservation-related employment, Cape Vultures support wildlife tourism jobs with a present value worth ZAR 305.9m. Based on a study by the African Leadership University School of Wildlife Conservation (2020), biodiversity related tourism created 88,000 jobs in 2015 in South Africa. Based on social media interest, Cape Vultures attract c.a. 0.3% of wildlife interest and therefore proportionately supports a over 260 tourism-related jobs annually.

The Cape Vulture also creates a present value of c.a. ZAR 1.0m in veterinary-related expenses. The regular call outs and operations all contribute to the value of the vultures. There is an implicit conservation value of ZAR 20.5m, which is related to the present value of the average annual donations received. There is also the ZAR 3.1m present value of carcasses used as supplementary feed.

In total, the calculated total economic value of the Cape Vultures in the region is based on the sum-of-the-parts is ZAR 376.2m.



Source: Endangered Wildlife OÜ

Hedge Value

The Hedge Value follows the structure of a financial hedge and is calculated using a modified Black Scholes Pricing Model that is specifically adapted to form a specialised model for individual species of biodiversity.

While this is a less traditional form of biodiversity valuation, it is an important value in that it is comparable to other biological asset valuations.

The Carrying Capacity (CC) and Minimum Viable Population (MVP) forecasts are based on 30-year population simulations. These two population levels are estimated using a Population Viability Analysis, which simulates population trends by taking into account:

- Species-specific data;
- Population-specific data;
- Management data; and
- Probability of stochastic events.

The Cape Vulture population is first valued relative to the probability of the population reaching CC. When a population crosses the CC threshold, there is a risk that the population becomes destructive and erodes value.

The population is then valued relative to the probability of the population falling to the MVP. When a population falls below the MVP, there is a risk that the population may go extinct and therefore lose all value.

The final Hedge Value of the species is calculated as the difference in value between the MVP and CC values.

As previously described, it is estimated that the population's Carrying Capacity is 31,300 individuals, while the Minimum Viable Population is 80 individuals. The population models indicated that:

- There is a 49.9% probability that the current population will reach high population trend levels;
- There is a 51.6% probability that the Carrying Capacity Population will reach high population trend levels; and
- There is a 48.1% probability that the Minimum Viable Population will reach high population trend levels.

Based on current geopolitical and economic conditions, combined with the vulture's population dynamics, the calculated Cape Vulture hedge value is ZAR 1.4m.

Hedge Value	
Minimum Viable Population Value	ZAR 475,139,315
Carrying Capacity Value	ZAR 509,712,855
Hedge Value	**ZAR 1,405,777**
Source: Endangered Wildlife OÜ	

Species Existence Value

The Species Existence Value reflects the base value that the species generates and the equivalent opportunity cost to society if the species population were to decline or to become extinct. It is calculated by adding:

- Aesthetic Value
- Carbon Value
- Economic Value
- Hedge Value

Due to the study referred to in the *Scientific American*, it has been possible to estimate a Carbon Value for the Cape Vulture. While the study was based on vultures in general, it is believed that these averages are sufficient to be applied to the Cape Vulture population, as they refer to the general CO_2e released on average by carcasses.

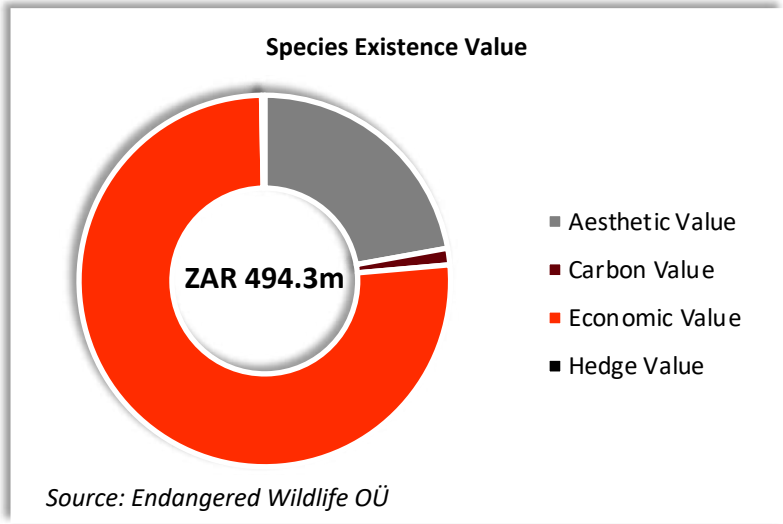
As a result, the Species Existence Value for the Cape Vulture population in South Africa is calculated as the sum of:

- Carbon Value – ZAR 7.1m
- Aesthetic Value – ZAR 109.6m
- Economic Value – ZAR 376.2m
- Hedge Value – ZAR 1.4m

This results in a total baseline Species Existence Value of ZAR 494.3m, with the main contributing value being the economic value which accounts for c.a. 76.1% of the total value.

This value excludes illegal and unsustainable consumptive values, such as the value generated through the harvest of vultures for traditional medicine.

It should also be noted that this is a baseline value which is dependent on current conditions. The valuation can change periodically if and when any underlying assumptions are revised.



Source: Endangered Wildlife OÜ

Impact and Total Conservation Value

The calculation of the Impact Value uses a combination of environmental statistics and pure statistics to calculate the value created through the proper management of a target species.

It represents the relative change in the Species Existence Value created through the active management of the target species. This is calculated by running a Population Viability Analysis scenario based on the implementation of a viable conservation effort to support or to increase the population of the vultures over a 30-year forecast period.

This scenario is then integrated into a pure statistical network, which assesses the relationship between the probability of the future simulated vulture population, relative to the probability of the populations of other species with which the vultures interact, and other exogenous variables. These include:

- Rainfall
- Herbivores
- Predators
- Other scavengers
- Human interferences

As a vital scavenger, vultures help to balance and maintain the ecosystem. They are remove dead, decaying and potentially diseased carcasses from the environment and thereby help to maintain healthy ecosystems. Despite the importance of the role that they play, vultures are vulnerable. As such, there is an intricate balance between the presence of vultures and the survival of other species.

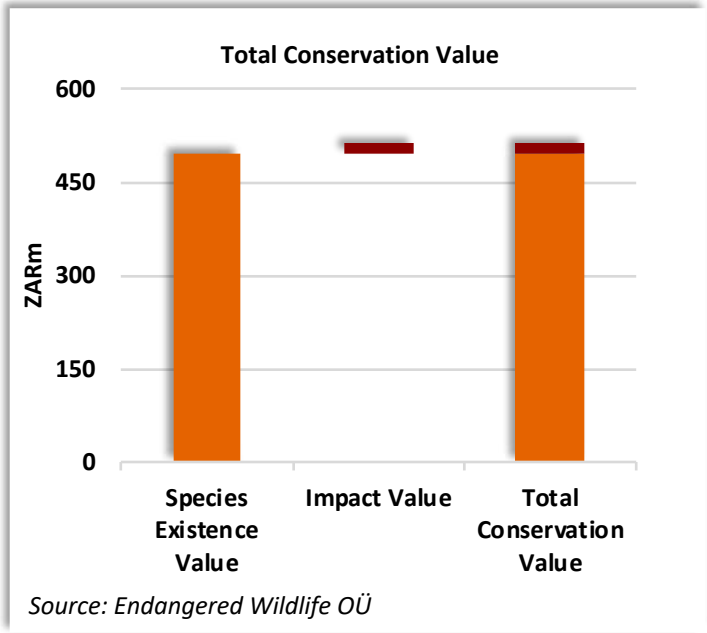
The analysis indicates that there is a 51.6% probability that, if the vulture population is effectively protected over the next 30 years, it could reach a high population level. This reflects an Impact Value in monetary terms of ZAR 16.8m (a relative increase in value of 3.4%).

While the Species Existence Value alone urges for the need to ensure the longevity of the population, the calculated Impact Value justifies the active conservation of the vulture population. This value, and the need to support the population, is further justified by the value of the population that is created through the role that the species plays naturally as a key “ecosystem manager” in the region.

Summing the Species Existence Value and the Impact Value gives the calculated Total Conservation Value of the regional vulture population to be ZAR 511.2m. This equates to an average value per individual vulture in South Africa of ZAR 31,987.

Impact Value	
Species Existence Value	ZAR 494,325,762
… Probability of high population	51.6%
Impact Value	**ZAR 16,840,761**

Source: Endangered Wildlife OÜ



Source: Endangered Wildlife OÜ

Conclusion

The vulture generally is one of the misunderstood species that has been given a bad reputation in popular media. In popular culture, it characteristically portrays death, morbidity or sneaky behaviour, and is depicted as an ugly or spooky bird. This perception is exacerbated by media. According to IMDB, vultures are portrayed in 21 movies and TV series, with *The Jungle Book*, *Robin Hood*, and *Bedknobs and Broomsticks* being amongst the main titles. In most of these, the vulture is depicted in accordance with the popular, yet misconceived, image.

Yet vultures indiscriminately provide vital services to humans:

- Vultures effectively contribute to reducing the healthcare burden on human economies. They form a natural barrier between human communities and the pathogens carried in carcasses. As explained previously, this became evident in the case of India whereby the loss of the vulture populations cost the economy equivalent to approximately ZAR 590bn. Unfortunately, this sort of value can normally only be calculated on a retrospective basis once the species is lost and the negative implications begin to be felt. This is a real option value that can significantly increase the value of the Cape Vultures if the relationship between their existence and healthcare can be better understood.
- In a similar manner, vultures are vital to the survival of the local biodiversity. They perform a clean up service that prevents the outbreak of diseases to other species. This is particularly important in South Africa considering that c.a. 14% of foreign tourists add a biodiversity component to their travel to South Africa. According to African Leadership University School of Wildlife Conservation (2020), biodiversity tourism created over 88,000 jobs and generated ZAR 31bn in direct spend into the South African economy in 2015. The loss of vultures could significantly and adversely impact the long-term survival of the other species (including the Big 5). This, in turn, could place the wildlife tourism value under threat. Again, this is a significant real option value for the Cape Vulture that will only be really quantified when the worst case scenario occurs.

Although values relating to tourism may be influenced by the popularity of species and the desire for tourists to see the species, it still forms an important foundational value.

Additionally, of particular interest is the associated Carbon Value of the birds. While the individual average annual carbon value of ZAR 15.64 may not be significant, over a 30-year period the total value at the current Voluntary Nature Based Offset market price equates to ZAR 469. This is greater than the lower bound of the poaching value and, taking the entire population into account, equates to ZAR 7.1m. This is a particularly interesting value in that it could become a potential nature based carbon offset income earned by the vultures provided that the carbon offset meets the regulatory requirements.

Based on the values that are currently known and justifiably measurable, the Cape Vulture population has a baseline Total Conservation Value of ZAR 511.2m. This value, which is created by the vultures being alive and in their natural environment, is significantly greater than the ZAR 300 to ZAR 1,500 paid for an illegally poached vulture and the unsustainable consumptive use average value of approximately ZAR 7,500.

The population is declining and there is a persistent threat on the Cape Vulture populations that has made it increasingly important to protect and ensure the longevity of the South African vultures. The calculated value of ZAR 511.2m, added to the real option values generated from the services that the vultures provide, should motivate why the Cape Vultures should be protected – they provide far more value alive than dead.

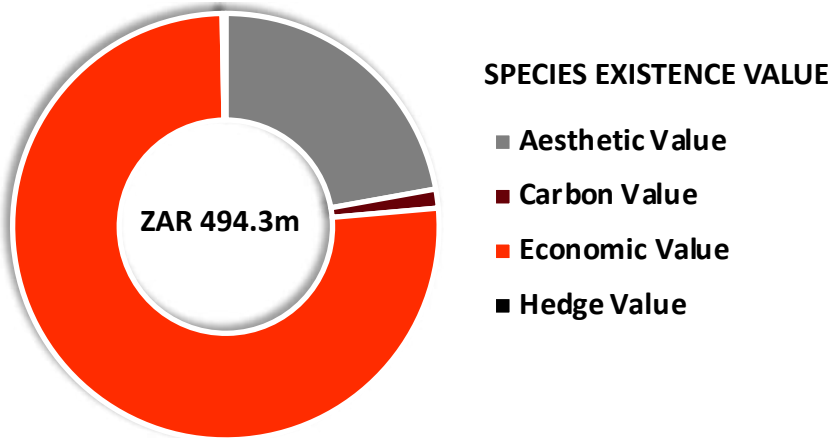
Cape Vulture

Shana Vida Gavron & Aristi Andrikou-Charitidou

Gyps coprotheres

South Africa

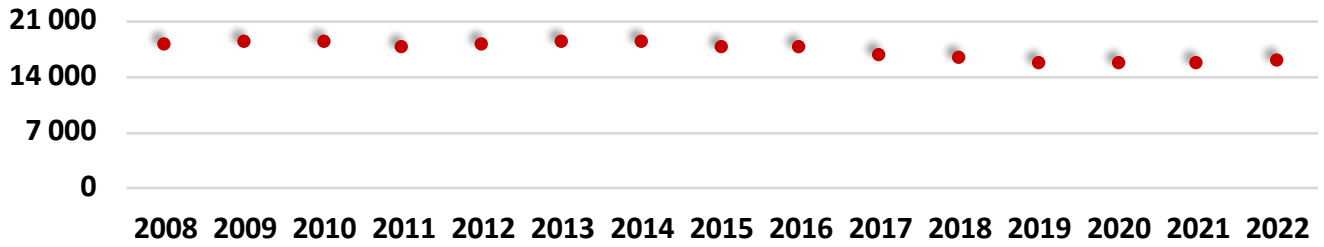
TOTAL CONSERVATION VALUE **ZAR 511,166,523**

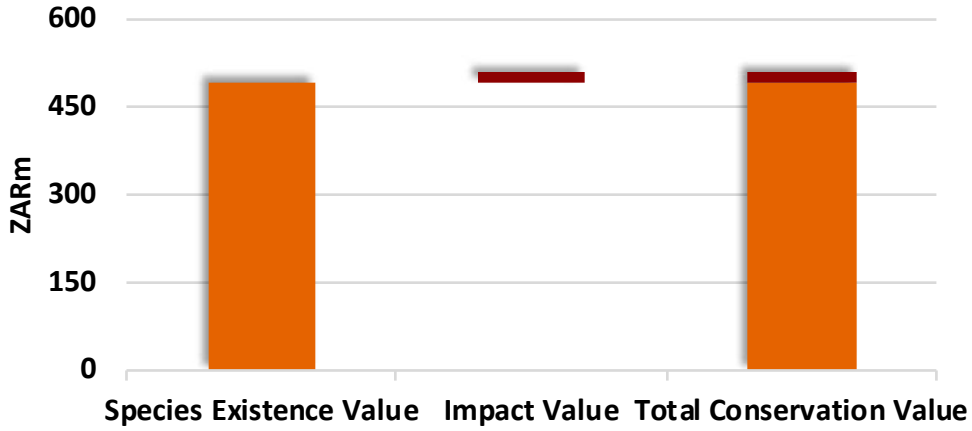


IUCN RED LIST RATINGS

NE	DD	LC	NT	VU	EN	CR	EW	EX

INFERRED POPULATION TREND





Glossary of Terms

Aesthetic Value is traditionally defined as the value created by biodiversity through the beauty and quality of life created by the species and environment. It is calculated as a willingness to pay, i.e. the maximum price a person is willing to pay to see the species, plus a virtual willingness to pay, i.e. the price a person is willing to pay for a product related to the species on e-commerce platforms.

Carbon Value is defined as the value of the CO_2e removed from the atmosphere by a particular species at the time of the valuation and the expected CO_2e to be removed in the future.

Economic Value is defined as the value that is created by biodiversity through their contribution directly to the economy, taking into consideration up to 28 different economic sectors.

Hedge Value is defined as the statistically-driven financial value that a stakeholder would be willing to pay to prevent the population from falling below the Minimum Viable Population or rising above the Carrying Capacity.

Species Existence Value is the sum of the four parts – the base economic value that the species generates and the equivalent opportunity cost to society if the species population were to decline or to become extinct.

Impact Value is the added value that is created by increasing the population sustainably through active conservation or species management taking into account management, ecosystem and exogenous factors.

Total Conservation Value is the sum of the Species Existence Value and the Impact Value, and represents the total value created by the species population when it is sustainably and actively protected and managed.

Credits & Disclaimer

Endangered Wildlife OÜ is the Estonian ESG tech for good behind the development of the Biodiversity Valuator, a software solution that uses machine learning to calculate the financial value of individual species of biodiversity in specific locations based on an internally developed biodiversity valuation methodology that combines pure finance with pure statistics, environmental statistics and environmental economics.

Shana Vida Gavron
CEO of Endangered Wildlife OÜ
shana.gavron@endangeredwild.life
Mob.: +33 610 045 716

Aristi Andrikou-Charitidou
Environmental Valuation Manager
aristi@endangeredwild.life

John David Mbeya
Financial Economist
valuations@endangeredwild.life

Michele Milstein
CMO of Endangered Wildlife OÜ
michele@endangeredwild.life

Abdelrahman Abozied
Machine Learning Engineer
abdelrahman@endangeredwild.life

Disclaimer

Image Credits

EW holds licences to use the species' images on a non-exclusive, commercial, worldwide and revocable basis from Envato Elements Pty Ltd and Megapixl by Dreamstime. Images are also supplied by Vulpro.