UN environment programme

CMS

CONVENTION ON MIGRATORY SPECIES

UNEP/CMS/COP14/Doc.31.4.8

8 June 2023

Original: English

14th MEETING OF THE CONFERENCE OF THE PARTIES
Samarkand, Uzbekistan, 12 – 17 February 2024
Agenda Item 31.4

PROPOSAL FOR THE INCLUSION OF THE SOUTHERN AFRICAN POPULATION OF BEARDED VULTURE *(Gypaetus barbatus meridionalis)* ON APPENDIX I OF THE CONVENTION*

Summary:

The Government of the Republic of South Africa has submitted the attached proposal for the inclusion of the Southern African population of Bearded Vulture (*Gypaetus barbatus meridionalis*) on Appendix I of CMS.

*The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CMS Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.

PROPOSAL FOR THE INCLUSION OF THE SOUTHERN AFRICAN POPULATION OF BEARDED VULTURE *(Gypaetus barbatus meridionalis)* ON APPENDIX I OF THE CONVENTION

A. PROPOSAL

Inclusion of the southern African population of Bearded Vulture *Gypaetus barbatus meridionalis* on the Convention on the Conservation of Migratory Species of Wild Animals (CMS) Appendix I. The current CMS Appendix II listing will remain in place.

The southern African Bearded Vulture population is a single population ranging across the high altitude areas of the Republic of South Africa (referred to from hereon as South Africa) and the Kingdom of Lesotho (referred to from hereon as Lesotho). The population has been classified regionally as Critically Endangered, due to its small and declining population size, restricted range, range contraction, and susceptibility to several threats in Lesotho and South Africa (Krüger 2015). The southern African sub-population is geographically isolated and has been found to be genetically distinct from Bearded Vultures elsewhere in the world and should be managed and conserved as such (Streicher et al. 2021).

The proposal focusses on the uplisting of only the local population of the sub-species because this population is threatened with extinction and needs immediate support considering its critically endangered status, its geographic separation from other populations of the sub-species (see 1.4), its genetic uniqueness, and the wealth of information available on the population from decades of research and monitoring to support the proposal.

The inclusion of the southern African Bearded Vulture population on CMS Appendix I aims to promote actions to ensure the favourable conservation status of this species and its habitat. This geographically isolated population of Bearded Vulture is in danger of extinction. The outcome of the baseline model of a recent Population Viability Analysis undertaken for the species predicted that there will only be about 60 birds (20 breeding pairs) remaining in the wild in 50 years' time, based on current trends and should no further interventions be implemented (Krüger et al. 2022).

The uplisting to Appendix I is considered an important tool to aid in the protection of the species because it prohibits the taking of such species; promotes conserving and where appropriate restoring their habitats; prevents, removes or mitigates obstacles to their migration (in this case across the border between Lesotho and South Africa); and controls other factors that might endanger them. Although the species is already protected at a national level in South Africa, it is not well represented or conserved in protected areas in southern Africa, and decision making by authorities consistently fails to take the needs of the species into account. The uplisting will increase the profile of the population and improve protection and funding at an international level. The uplisting will enforce consideration of the species' needs in decision-making processes in South Africa.

B. PROPONENT

Government of the Republic of South Africa, the only CMS Party Range State for this subspecies, supported by the government of the Kingdom of Lesotho, a CMS non-Party Range State.

C. SUPPORTING STATEMENT

1. Taxonomy

1.1 Class Aves
1.2 Order Accipitriformes
1.3 Family Accipitridae

1.4 Genus, species or subspecies, including author and year
Gypaetus barbatus; Linnaeus, 1758
Gypaetus barbatus meridionalis; Keyserling & Blasius, 1840

Two distinct subspecies are recognised based on plumage characteristics (Hiraldo et al. 1984). *Gypaetus barbatus barbatus* occurs north of the Tropic of Cancer (NW Africa, SW Europe through Türkiye, Egypt, Middle East, Iran (Islamic Republic of) and Afghanistan to Mongolia and central and NE China) while *Gypaetus barbatus meridionalis* was described from south of the Tropic of Cancer, i.e. sub-Saharan Africa (Ethiopia, East Africa and southern Africa). Populations of *G. b. meridionalis* have similar phenotypes in that they lack a black 'ear' tuft and breast collar and are smaller in size compared with their northern counterparts.

1.5 Scientific synonyms

None

1.6 Common name(s), in all applicable languages used by the Convention

English: Bearded Vulture
Spanish: Quebrantahuesos
French: Gypaète barbu

2. Overview

Globally the Bearded Vulture (*Gypaetus barbatus*) is classified as Near Threatened (BirdLife International 2022). Regionally, the southern African population of *Gypaetus barbatus meridionalis,* is classified as Critically Endangered (Krüger 2015). The southern African sub-population is genetically distinct and should be managed and conserved as such (Streicher et al. 2021). For this reason, the regional population should be recognised globally as a separate management unit and cognisance taken of its conservation status.

The population is a small geographically isolated one that is restricted to the Maloti-Drakensberg mountains of Lesotho and South Africa where it regularly migrates between the two countries The population is declining due to a number of threats in both countries. Poisoning, both intentional and unintentional, is by far the greatest threat to the population, followed by collision with powerlines.

The population size is estimated at 334 individuals, including approximately 100 breeding pairs (Krüger et al. 2022). By 2012, the breeding range of the Bearded Vulture in southern Africa had decreased by 27%, and the number of occupied breeding territories had decreased by 32-51% in a period of five decades (Krüger et al. 2014a), representing an unequivocal decline in this population at a rate of between 0.64-1.02% per year. This rate of decline was recently confirmed in a Population Viability Analysis undertaken for the species which predicted that there would only be about 60 birds (20 breeding pairs) remaining in the wild in 50 years' time, should no further interventions be implemented (Krüger et al. 2022).

The Bearded Vultures move over large areas and are not well represented or conserved in protected areas. Conservation measures thus need to be implemented across the entire species range in Lesotho and South Africa. A strategy is therefore required to focus on securing the current wild population through threat mitigation *in situ* coupled with supplementation from an *ex situ* population**.** The uplisting to Appendix I is seen as one of the tools to aid the protection of this migratory population.

3. Migrations

3.1 Kinds of movement, distance, the cyclical and predicable nature of the migration

Recent studies of the movement of vultures using satellite telemetry have shown the vast cyclical movements undertaken by this group of species. One of these studies, undertaken on this geographically separate population of *G. B. meridionalis* between 2007-2023, show that a significant proportion of individuals cyclically and predictably cross national jurisdictional boundaries.

Data from satellite transmitters fitted to 21 Bearded Vultures of five age classes were used to understand the movements of this population, including the post-fledging dependence period and the onset of natal dispersal (Krüger et al. 2014b; Krüger and Amar 2017a). These data were used to determine movement patterns and the overall foraging range of the entire population.

The ranges of the individuals were calculated using the kernel density and Minimum Convex Polygon (MCP) methods. The kernel and MCP ranges of marked birds in this study covered the documented range for the species and can therefore be considered the foraging range of the entire population in southern Africa. The total area of use of all age classes was 51,767 km^2 based on the 90% kernels of all individuals combined (Figure 1). Although juvenile, immature and sub-adult birds used different parts of the overall range, their combined foraging range was 65% (33,636 km^2) of the overall range (Figure 1). The migratory nature of the population is evident in that they spend 90% of their time moving across the border between the two countries.

The foraging areas of non-breeding birds covered most of the range, whereas adult home range areas were focused around their specific breeding territories with some overlap between territories. The average adult home range was 286 km^2 and the size of the average foraging range of non-adults was 10,540 – 25,985 km^2 (Figure 2). Although adults may be resident in their territory and thus in one country throughout the year, individuals do not remain ‘resident’ in the same area year-round and may make very significant movements over the course of a year including crossing over national boundaries. Their movements may be in response to food scarcity and are thus predictable and cyclical.

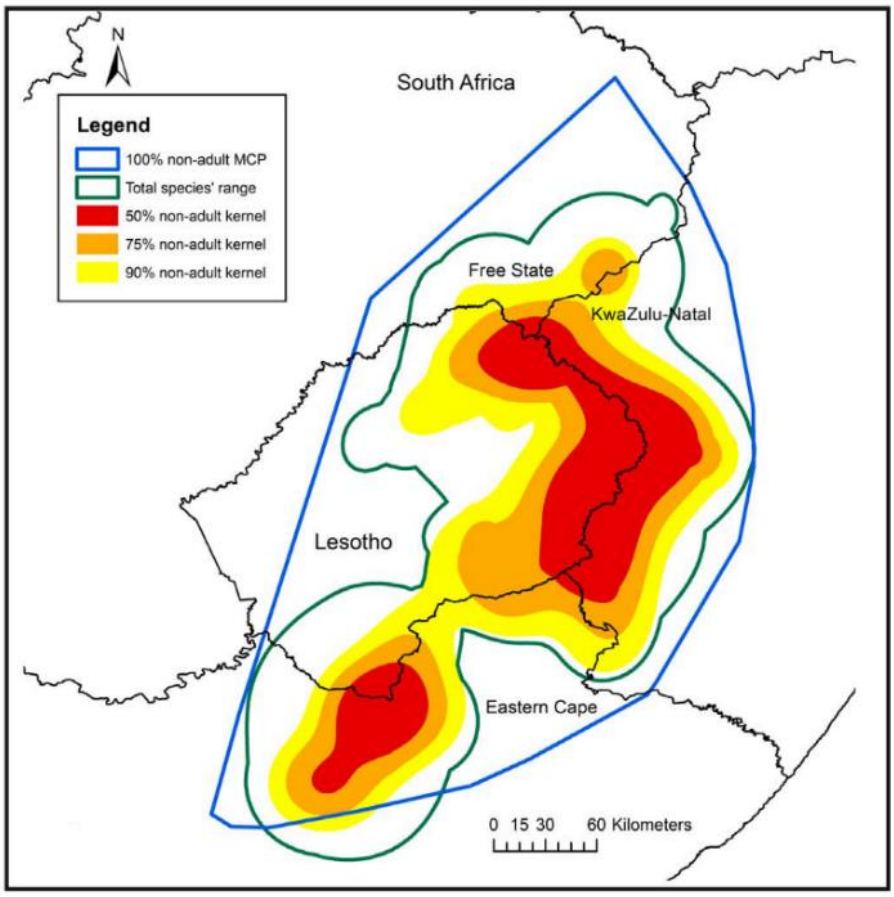

Figure 1: The home range of the Bearded Vulture in southern Africa

Home ranges of breeding adults did not vary in size between seasons but adults utilised their home range more intensively whilst breeding, moving greater distances during the incubation and chick-hatching period. Range size and use of non-adults increased with age and fledglings progressively increased and used their home ranges as they aged and undertook pre-dispersive exploratory flights. Fledglings increased their home range size from an average of 0.4–10,999 km^2 (100% MCP) and 9.13–11 466 km^2 (fixed 95% kernels) within the first six months post fledging.

Distances travelled were based on the distances between hourly GPS fixes of the transmitters. On average, juveniles travelled a minimum distance of 5.2 km per hour with distances ranging from 0 – 51 km per hour. The average hourly distance travelled by immatures was 6.8 km (range of 0-123 km), subadults was 7.8 km (0-109 km), and adults was 4.1 km (0-184 km). The maximum daily distances that fledglings travelled from the nest (between 23 - 53 km) occurred between 98 and 136 days post fledging, after which time they dispersed from their natal area. Distances between fixes were highest during the dispersal period when the average the maximum daily distances travelled from the nest was 132 km.

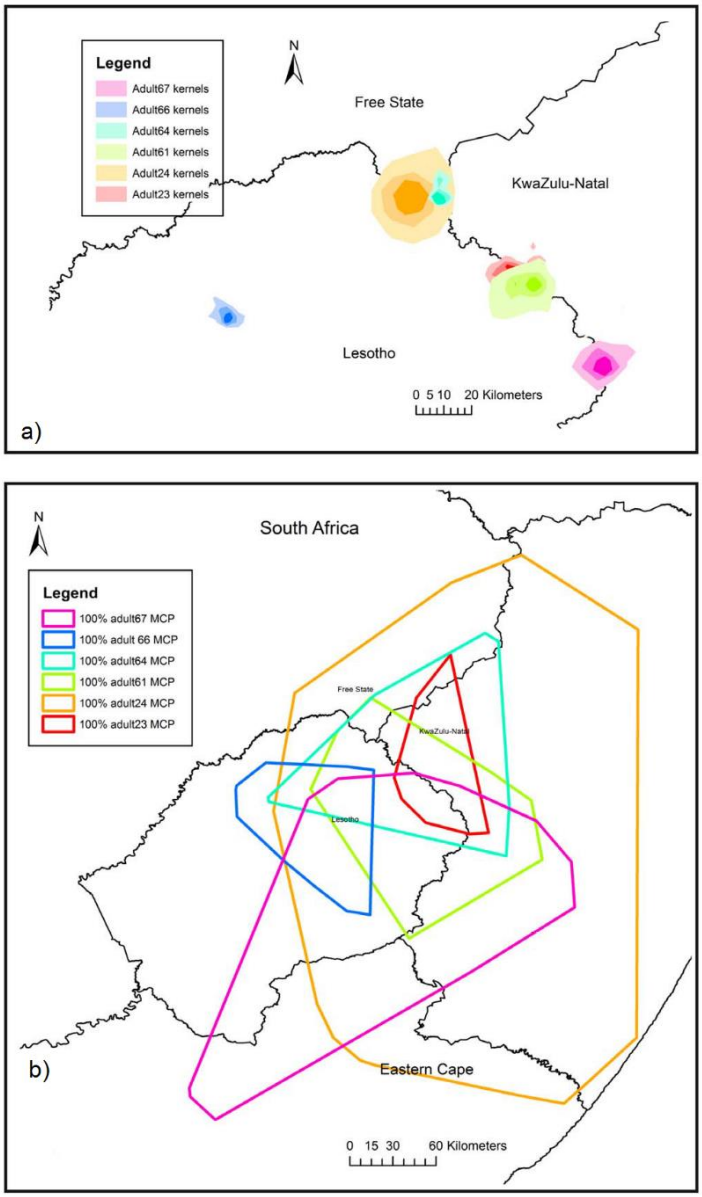

Figure 2: Adult Bearded Vulture home ranges in southern Africa showing:a) 50%, 75% and 90% kernel home ranges, and b) Minimum Convex Polygon home ranges for all adults (both in the breeding and non-breeding seasons)

The migration of this species takes place throughout the year, however adults move shorter distances during the breeding season. Winter is a period of food shortage in the region because livestock are moved to lower altitudes and ungulate deaths are low at the beginning of the season thus birds may be required to fly further in search of food when food resources are scarce. All supplementary feeding sites are located in South Africa, therefore there are cyclical cross-boundary movements in search of food, particular for non-adults and non-breeding adults whose movements are indicative of spatially unpredictable or highly dispersed food resources.

The regular and predictable cross-border movements are also a response to the life history patterns of the species. Interactions with conspecifics, territory exploration with age (immatures), searching for a partner (subadults) and searching for territories (adults), are all factors that result in regular cross-border movements.

3.2 Proportion of the population migrating, and why that is a significant proportion

The population size is estimated at 334 individuals. The age ratio (adults: non-adults) found in this population is 1: 0.6 (Brown 1997; Krüger 2014); therefore the number of adults in the population is approximately 200 (100 pairs) and the number of non-adults is approximately 134. All non-adult birds (40% of the population, 134 birds) are migratory because as they age, the areas within the species range that they explore increases and they cover the entire species range before they become adults and establish a territory (Krüger et al. 2014b; Krüger and Amar, 2017). Adult birds are territorial, therefore adults in territories near to or overlapping the international boundary are considered migratory (Figure 2). The average adult home range size is 286 km^2 (Krüger et al. 2014b) and the number of occupied territories in the population is 100, with 40% of these overlapping the international boundary. Therefore 40% of the adults (80 birds) in the population are migratory. This a significant proportion of the population that is migratory because it is essential to protect the breeding portion of the population.

In summary, over half the entire population (64%) is migratory with individuals spending around 90% of their time moving regularly across the border between the two countries.

4. Biological data (other than migration)

4.1 Distribution (current and historical)

Prior to 1700, the Bearded Vulture was distributed across southern Africa, extending from the south-western Cape to northern KwaZulu-Natal (Figure 3). Isolated records in Limpopo, Mpumalanga, Northern Cape and those along the coast in KwaZulu-Natal, Eastern Cape and Western Cape are assumed to be sightings of juveniles/immatures and non-breeding adults rather than confirmed nest sites or are records of questionable integrity. The population experienced dramatic range contraction and lost about 80% of its former distribution range during the period 1700 – 2020, restricting the birds to an estimated area of occupancy of 28,125 km$^{2.}$ currently (Krüger et al. 2014).

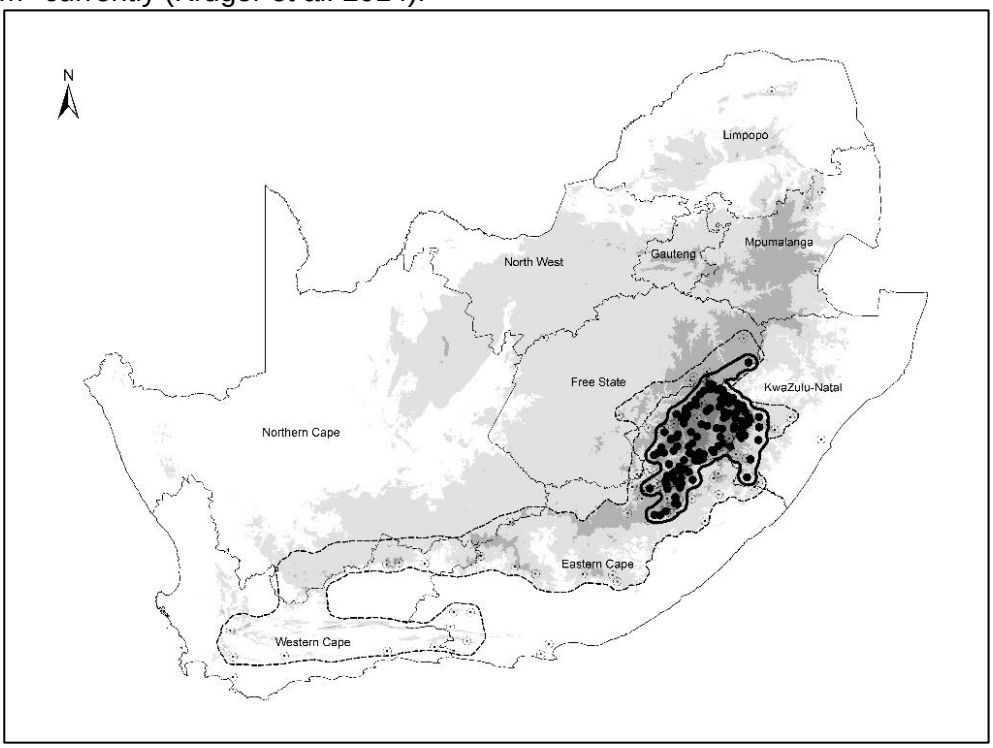

Figure 3: Bearded Vulture *Gypaetus barbatus* breeding distribution in southern Africa where open circles surrounded by the stippled line depict the former range (pre 1700) and solid dots surrounded by a solid line depict the current breeding range based on data from Boshoff et al. (1983); Brooke (1984);

and Krüger et al. (2014). Dark grey shading indicates areas with an altitude of >2200 m above sea level; mid grey is 1600 – 2499 m and pale grey is 1200 - 1599 m.

4.2 Population (estimates and trends)

In the 1980s, the breeding population was estimated at 204 pairs based on extrapolations from 61 known breeding territories (Brown 1992). The breeding density ranged from 3.4 – 7.2 pairs/1,000 km^2 in the seven geographical regions used by Brown (1992) to estimate density. In the 1990s, Colahan and Esterhuizen (1997) observed no breeding pairs in the Free State, and Maphisa (1997) noted that sightings in the lowlands of Lesotho were rare and that some breeding territories were abandoned. In 2000, the Bearded Vulture was classified as Endangered in the Red Data Book of birds of South Africa, Lesotho and Swaziland (Anderson 2000), as a result of its small and continuously declining population size, restricted range, range contraction, and its susceptibility to several known threats in Lesotho and South Africa.

In the 2000s, breeding territories were monitored throughout the range to obtain a more accurate measure of territory occupancy, density, and population size (Krüger et al. 2014). The change in the breeding portion of the population was calculated between the former (1960 – 1999) and current (2000 – 2012) time periods. They found that the number of occupied breeding territories decreased by a minimum of 32% and a maximum of 51% over the five-decade time period. The population was estimated at a minimum of 352 and a maximum of 390 individuals. Breeding densities also decreased by 20%, declining from 4.9 to 3.9 pairs/1,000 km^2. Nests were located about 9.0 km apart, a slight increase from the 7.7 km recorded formerly.

In 2022, the population was estimated to consist of 334 individuals (100 breeding pairs) based on territory occupancy during the period 2012 - 2022 (Krüger et. al. 2022).

4.3 Habitat (short description and trends)

In southern Africa, breeding and foraging of Bearded Vultures is currently restricted to open habitat (grasslands) on rugged mountains and escarpments, above 1,500 m above sea level. As large, soaring birds, Bearded Vultures depend on thermal or orographic lift to sustain energy-efficient flight. They forage along ridges and valleys in protected areas but range out over communal and commercial lands, with adult birds more frequently avoiding human habitation (Brown 1997, Abbass 2021). Adults tended to use areas in relatively close proximity to their nest sites, whereas non-adult birds used areas across the entire species range. They breed predominantly on basalt cliffs between 2,500 – 3,500 m above sea level, but some nest sites do occur in the sandstone layer approximately 1,800 m above sea level.

Reid et al. (2015) found that distance to nests, distance to supplementary feeding sites, and topographical variables influenced habitat selection of Bearded Vultures. Nest abandonment by Bearded Vultures is associated with increasing anthropogenic activities (settlement and power line density) whereas those territories with feeding sites in close proximity are more likely to remain occupied (Krüger et al. 2015a). Abbass (2021) modelled habitat selection in relation to various topographic and habitat variables, including information on built-up areas (i.e. areas with a high density of buildings), and found that Bearded Vultures select areas closer to their nest sites and supplementary feeding sites, areas with steeper slopes, and highly rugged terrain. They also select areas with grassland and avoid areas with forest/plantations and built-up areas, while cropland is neither selected nor avoided. These results suggest that Bearded Vultures may be sensitive to land use change, particularly afforestation and urbanisation of the grassland foraging habitat, both of which are increasing.

Land use change (habitat loss, degradation, and fragmentation) is one of the major factors that has contributed to the decline of the Bearded Vulture in southern Africa, and continues to threaten this population since Africa is amongst those regions showing the most rapid anthropogenic land conversion. Habitat loss is predicted to continue at a rate of between 0.48% - 0.68% per year based on the percentage of breeding range lost during a 40-year period (Krüger et al. 2014), and based on land cover change in KwaZulu-Natal over a similar time period (Jewitt et al. 2015).

4.4 Biological characteristics

The Bearded Vulture is monogamous and a solitary nester that breed in winter. At most one fledgling is produced per successful breeding attempt, irrespective of the number of eggs laid; the older nestling usually out-competes the younger which then starves to death. Only around 54% of pairs attempt to breed each year, and although nesting success for pairs attempting to breed was relatively high (75%), the resultant productivity is low (0.42 young per pair per year) (Krüger and Amar 2017b).

There are no published records of maximum age in the wild of African Bearded Vultures. When estimating the approximate longevities from empirical formulae (Newton 1979) the longevity of wild birds should be between 22 and 23 years. Survival rates estimated from marked birds were low for adults in particular (86%), in relation to other raptor species with similar life histories (Krüger 2014). There is no evidence to suggest that the survival rates of males and females are different.

Bearded Vultures forage exclusively from the air by gliding and soaring over open grassland or along ridges. There are no observations of predation by the Bearded Vulture in southern Africa, and all food is scavenged from dead animals. Their diet consists mainly of bones from both fresh and old carcasses which they are well-adapted to handle and process, having a wide gape of about 70 mm which allows bones of up to 250 mm long by 35 mm in diameter to be swallowed and digested effectively with a pH of 1.0-1.5. They are able to disarticulate bones from skeletons by tearing or cutting tendons and ligaments using the bill, and thus able to utilise completely dried-out carcasses. They are able to fly with large bones (up to 69-83% of their body weight) held parallel to the body and drop these on an ossuary or ‘rock’ anvil to reduce large bones to manageable pieces to swallow. Competition with other birds for food is rare, because of their unique diet.

A genetic study by Krüger et al. (2015b) identified reduced haplotype diversity in southern Africa compared with populations in the Northern Hemisphere. Although the Southern African population harbours less genetic diversity than would be expected under Hardy–Weinberg, it is still higher than that seen in other African vulture species. Streicher et al. (2021) assessed the phylogeographic structure and genetic connectivity among *G. barbatus* populations across Africa and Europe, and also combined the genetic data with ecological and behavioural data to predict the population’s future trend. The southern African population was found to show spatially correlated genetic differentiation between regional populations and low levels of gene flow between these population fragments. Since the southern African Bearded vulture population is both geographically and genetically isolated from other populations, and consequently holds a unique genetic assemblage, the findings of Streicher et al. (2021) supports the management of this population as a separate entity. Their findings also suggests that the population may represent a reservoir of genetic variation that should be given separate conservation status.

The southern African Bearded Vulture population is geographically and genetically isolated. This, together with the drastic population decline and reduced genetic variability, places the population at risk genetically and raises concern for the long-term population health and persistence of the species in southern African. Genetic diversity levels will continue to decline

if the population bottleneck is indefinitely sustained. In order to preserve this population's gene assemblage, active management to minimise external threats, and mitigate factors leading to population structuring, must be taken.

4.5 Role of the taxon in its ecosystem

The Bearded Vulture is an integral component of the environment, performing an essential ecological role as a scavenger. Bearded Vultures are an economical way of disposing of carcasses and in doing so they may limit the spread of disease. Based on empirical studies and models, vulture declines are predicted to cause trophic cascades and disease outbreaks (Buechley and Şekercioğlu 2016). The Bearded Vulture is a spectacular sight in its own right and plays a role in generating tourism revenue, for example specialised bird tourism and photography. Apart from its aesthetic value, the Bearded Vulture also has spiritual and cultural values and has played a role in many cultures over the centuries (*e.g.* ancient Egyptians, Buddhists), and more recently where feathers are known to be used for ceremonial purposes. Bearded Vultures are an important part of the natural ecosystem and national heritage that need to be protected for future generations.

5. Conservation status and threats

5.1 IUCN Red List Assessment (if available)

Regionally, the Bearded Vulture was uplisted from Endangered in 2000 (Anderson 2000) to Critically Endangered in southern Africa in 2015 due to the population and range declines and presence of ongoing threats to the species (Krüger 2015).

Globally, the species has been uplisted from Least Concern to Near Threatened owing to evidence that the species has undergone a moderately rapid population decline over the past three generations (BirdLife International 2022).

5.2 Equivalent information relevant to conservation status assessment

BirdLife South Africa published the status of the species in the Red Data Book of Birds of South Africa, Lesotho and Swaziland (Taylor 2015) based on the conservation assessment of Krüger (2015).

Although the species is not listed as Endangered globally (see 5.1), the southern African Bearded vulture population has been found to hold a unique genetic assemblage because of its geographic and genetic isolation (Streicher et al. 2021). These findings support the management of this population as a separate management unit. The findings also suggests that the population may represent a reservoir of genetic variation that should be given separate conservation status.

5.3 Threats to the population (factors, intensity)

Direct threats to the species listed in order of importance include unintentional poisoning/trapping relating to human-wildlife conflict, direct persecution, collision with energy infrastructure (powerlines), and unintentional poisoning through the ingestion of lead. Indirect threats include decline of food availability, human disturbance, and habitat loss and degradation. Potential future threats that will further negatively impact an already declining population include collision with wind farm infrastructure, genetic bottlenecks, unintentional poisoning with non-steroidal anti-inflammatory drugs (NSAIDs), climate change and trade and utilisation. These threats are detailed below.

Unintentional poisoning/trapping

Feeding on carcasses poisoned using baits targeting mammalian predators is the most significant cause for declines in this species (Krüger 2014). Birds are also known to have been caught in Gin traps or Coyote Getters meant for mammalian predators.

Persecution

The species is targeted for trade in parts for traditional medicine use or use of body parts such as feathers for ceremonial purposes (Mundy et al. 1992, Maphisa 1997, Mander et al. 2007). A number of surveys at markets in South Africa and Lesotho have identified Bearded Vulture carcasses. The birds are either poisoned, trapped or shot. Gin traps and Coyote Getters have been used to capture and kill Bearded Vultures in the Free State Province (Ambrose 1983; Colahan 1991; Colahan and Esterhuizen 1997), in Lesotho (Ambrose 1983; Blair and Blair 1983) and in KwaZulu-Natal (pers. obs.), where a juvenile was caught in a Gin trap in 2006. Direct persecution through shooting may increase as the number of firearms increases in Lesotho (Maphisa 1997). One of the marked birds in South Africa was shot and killed in the Free State province in 2017 and a fledgling was killed in Thaba-Tseka District in Lesotho in 2019.

Collision with energy infrastructure (powerlines)

A number of incidents have been recorded of birds colliding with powerlines and other cables, making this a significant threat (Krüger 2014). There is indirect evidence to support that the abandonment of territories is based on the density of powerlines within the territory. Since it is very difficult to detect collision carcasses in mountainous and remote terrain, the threat is assumed to be far greater than is recorded. If there was a massive increase in the electrification of the Lesotho highlands and if the electrification of the lowlands in South Africa continues and proposals for a cable way construction on the South African Drakensberg escarpment are successful, then collisions will likely increase. The species is known to collide with ski-lift and cable car infrastructure in Europe. New electrical infrastructure (powerlines over 11kv) are required to be fitted with bird mitigation devices.

Unintentional poisoning (lead)

Lead poisoning is considered a high priority threat. A study by Krüger and Amar (2018) identified lead levels in the bones of Bearded Vultures that suggests a long-term exposure to this heavy metal in southern Africa. It is likely that this substance is either ingested by feeding on carcasses containing lead shot or fragments of lead bullets.

Decline of food availability

The loss of natural ungulates, superior animal husbandry practices and improved animal hygiene has led to a reduction in the food supply and is considered by some (e.g. Boshoff et al. 1983) to be the most serious cause of the initial population decline and range contraction. Food shortage may still be one of the limiting factors to this population, especially in Lesotho where available carcasses are consumed by people or dogs and where there are no significant supplementary feeding sites.

Human disturbance

A range of human activities in close proximity to nesting sites may have an impact on breeding success and may cause abandonment of previously successful nests (Guy 1974, Kopij 2001; Krüger et al. 2015b). These include some farming activities and recreational activities such as mountaineering, avitourism, ziplining, photography and aviation. A range of developments and construction could have a similar effect. Eggs and nestlings have been removed from the nest and young birds have been attacked by vandals (Brown 1991). The intensity of disturbance may increase as a consequence of the opening up of the interior of Lesotho for the Lesotho Highlands Development Project. There are many new roads and associated infrastructure

such as power lines in the vicinity of the Katse and Mohale Dams and this is likely to allow people and development to populate much of the highlands (Maphisa 1997). Climate change related changes in land use may also pose a threat.

Disturbance/competition from conspecifics/raptors

White-necked Ravens *Corvus albicollis*, Cape Vultures *Gyps coprotheres* and Verreaux's Eagles *Aquila verreauxii* may pose a threat to Bearded Vultures in terms of access to feeding sites (e.g. a number of examples exist of Cape Vultures usurping Bearded Vulture nests). The natural behaviour or predation by these species may be altered by human activities. Large numbers of non-adult conspecifics at feeding sites located near breeding sites may reduce productivity.

Habitat loss and degradation

The change in land use from livestock farming to monocultures has and will further reduce the foraging range of the species. Breeding sites have been lost as a result of the construction of dams associated with hydropower development in Lesotho (e.g. Katse Dam). Further abandonment of nest sites is expected with the development of the Polihali Dam. Climate change related changes in land use may also result in further habitat loss, including the spread of alien and invasive species into grassland. The southern African population is predicted to experience further range contraction as a result of habitat loss due to climate change (an 18% loss of total suitable habitat in South Africa), making the population particularly vulnerable in the coming years (Subedi et al. 2022).

Fires

It is recognised that fires are a natural part of the system. However, intensive fires below the nesting cliffs, especially if they extend over a large area and over an extended time period, may impact breeding by affecting visibility and air quality (personal observations; Krüger 2005 and 2007).

Collision with energy infrastructure (wind farms)

The anticipated proliferation of wind farms in various parts of the species' range (in particular in the Lesotho Highlands, Eastern Cape and eastern Free State) could pose a serious risk to the species. Rushworth and Krüger (2014) and Reid et al. (2014) predict devastating consequences for the southern African Bearded Vulture population should the several thousand turbines currently planned for development in the Lesotho be placed on the same mountain ridges used for slope soaring by the birds. A habitat use model developed by Reid et al. (2014) is a useful tool to guide the placement of wind farms and wind turbines to reduce the impact on the species.

Genetic bottlenecks

The small, isolated southern African population could in the long term suffer a reduction in genetic diversity which could influence breeding success and its ability to adapt to global change, and ultimately reduce the probability of persistence of this population. This could also apply to planned reintroductions, if the reintroduced populations are geographically isolated and genetic exchange with existing wild populations unlikely and/or continued genetic supplementation does not take place.

Climate change

It is predicted that species breeding at higher altitudes may experience range contractions due to increased temperatures (Simmons and Jenkins 2007). Krüger et al. (2015b) did not find any support for the hypothesis that climate change (using altitude and aspect of nest sites) may be a factor in the abandonment of nest sites. Climate change related changes in land use may, however, pose a threat.

Birds ingesting foreign objects

Foreign objects at feeding sites that resemble bones in colour or shape, may be ingested by birds mistaking them for bones fragments. Foreign objects may also be investigated by birds out of curiosity and then ingested.

Disease

Vultures appear to be immune to harmful bacteria and viruses that are present in carcasses. Bearded Vultures are probably susceptible to avian diseases such as avian influenza, although no deaths in the wild have been attributed to disease in southern Africa.

Of the 22 Bearded Vultures found dead/trapped over a 20 year period (2000-2019), half (50%) of deaths were attributed to poisoning (of which 36% had high lead levels), 23% were attributed to direct persecution (trapped/shot/killed), 18% to collisions with powerlines, and 9% were assumed to have died of natural causes.

5.4 Threats connected especially with migrations

Since the southern African Bearded Vulture population is a single population of which the entire non-adult portion is migratory, all individuals in the population will be exposed to the threats in both range states at some stage in their life.

The direct and indirect threats to the species listed above are prevalent in both countries, although the intensity of the threat may vary between the countries. The increase in anthropogenic activities across the region and the potential future threats that have been identified will affect the individuals breeding and foraging in both countries, and further negatively impact an already declining population.

The anticipated proliferation of wind farms in various parts of the species' range (in particular in the Lesotho Highlands, Eastern Cape and eastern Free State), the anticipated massive increase in the electrification of the Lesotho highlands, the current rate of electrification of the lowlands in South Africa, and proposals for a cable way construction on the South African Drakensberg escarpment are of particular concern for this migratory species.

5.5 National and international utilisation

There is no legal/permitted national or international utilisation of the species in Lesotho or South Africa. Egg collecting for commercial trade does not appear to be an activity that is practiced currently. There is illegal/unpermitted utilisation of the species for belief-based uses, and trade of dead birds, or parts thereof, is known to take place at informal markets in Lesotho and South Africa. Birds are either poisoned, captured, or shot/stoned to supply this market.

6. Protection status and species management

6.1 National protection status

In South Africa, the Bearded Vulture is protected and managed under various suites of legislation, including the National Environmental Management Act, No 107 of 1998 (as amended), the National Environmental Management: Biodiversity Act, No 10 of 2004 (as amended) and the Threatened or Protected Species Regulations promulgated thereunder, the Animal Protection Act No. 71 of 1962 (as amended), and the Intergovernmental Relations Framework Act, No 13 of 2005 (as amended).

In KwaZulu-Natal Province, the protection of wild birds is governed by the provisions of the Natal Nature Conservation Ordinance No. 15 of 1974. In Schedule 9, the Bearded Vulture is specifically listed among the “Specially protected birds”. In Eastern Cape Province, the protection of wild birds is governed by the provisions set out in Chapter IV of the Eastern Cape Nature Conservation Ordinance No. 19 of 1974. The Bearded Vulture is referred to as “Endangered” in this legislation. In Free State Province, the Free State Nature Conservation Ordinance No. 8 of 1969, considers Bearded Vultures protected game (Chapter II).

6.2 International protection status

International conventions that South Africa is a signatory to that are relevant to the protection of the Bearded Vulture include: the Convention on the Conservation of Migratory Species of Wild Animals (CMS), incorporating the CMS Memorandum of Understanding on the Conservation of Migratory Birds of Prey (Raptors MOU), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

6.3 Management measures

There is international collaboration between South Africa and Lesotho (range state) in the management of the Bearded Vulture through a Memorandum of Agreement and the joint implementation of the Bilateral Bearded Vulture Recovery Strategy & Action Plan. Both countries are represented on the Bearded Vulture Task Force (BVTF; the Steering Committee of the Bearded Vulture Recovery Programme) and on the Steering Committee of the Bearded Vulture Breeding Programme.
A Biodiversity Management Plan (BMP) for the Bearded Vulture was gazetted by the South African Minister of Environmental Affairs on 8 May 2014 (Government Gazette Notice No. 37620). The Minister appointed Ezemvelo KwaZulu-Natal Wildlife as the lead agent for the implementation of the BMP in February 2016. The BMP was adopted for implementation in Lesotho by the National Vulture Task Force of the then Ministry of Tourism Environment and Culture. This BMP formed the basis of the Bilateral Bearded Vulture Recovery Strategy & Action Plan and remains in place until a national BMP for all vultures in South Africa is gazetted later in 2023.

A stakeholder-inclusive Population Viability Analysis (PVA) was held in 2022 to i) assess interventions required to achieve the species conservation objectives as defined in the draft Recovery Strategy, ii) revise the species targets if required based on the outcome of the PVA; and iii) identify priority conservation interventions that are necessary to ensure the persistence of the species in the wild with a particular focus on better understanding the scale of captive breeding required to support recovery in the wild. The baseline model estimated there would only be 62 birds (20 breeding pairs) remaining in the wild in 50 years’ time, should no further interventions be implemented. A range of scenarios that would best support the Bearded Vulture population’s recovery were considered (Figure 4). Based on this process, the final recommendation was to focus on securing the current wild population through *in situ* threat mitigation coupled with supplementation from a captive population.
To prevent the species from going extinct in southern Africa and to achieve the long-term goal of the Bearded Vulture Recovery Strategy and Action Plan (150 pairs by 2070), the Bearded Vulture Recovery Programme must achieve the following: i) Reduce mortality by 15% across all ages (i.e. prevent the deaths of an additional six birds per year); ii) Increase productivity in the wild by 5% (i.e. increase the proportion of females that breed and increase the number of chicks that survive until fledging); and iii) Harvest six eggs from the wild population for the next three years to build a captive flock of 32 birds (large enough to conserve >90% of the remaining genetic diversity of the wild population and produce sufficient chicks for release back into the existing wild population).

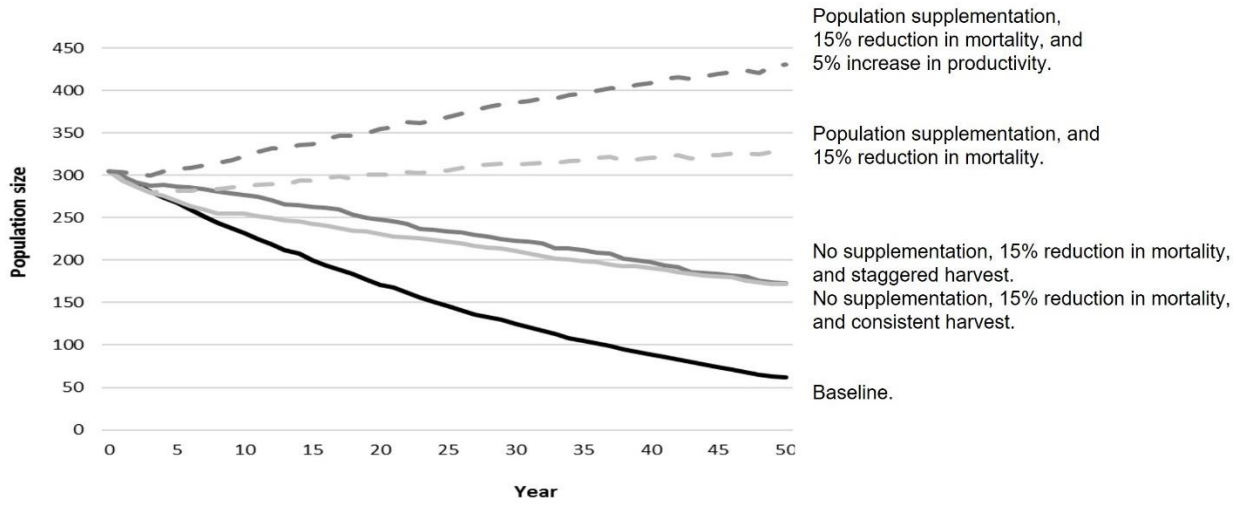

Figure 4: Graph showing population trajectories from modelled scenarios from a Population Viability Analysis workshop (Krüger et al. 2022).

The Bilateral Bearded Vulture Recovery Strategy & Action Plan lists all management measures that need to be implemented to achieve the species conservation targets. These measures are captured under 10 objectives and prioritised based on the outcomes of the PVA workshop. Objectives 1, 2, 3 and 4 address the intention of reducing mortality by 15%. Objectives 4, 5, and 6 address the intention of increasing productivity by 5%; Objective 7 addresses the intention of rapidly increasing the captive flock to 32 individuals; Objective 8 is cross-cutting and required to achieve all the objectives; Objective 9 is required to measure the success of any interventions; and Objective 10 is necessary to ensure the implementation of the Recovery Strategy to achieve all of the objectives.

6.4 Habitat conservation

Habitat conservation measures are identified under the objectives of ensuring the availability of sufficient suitable habitat for Bearded Vultures to breed and forage, ensuring availability of an appropriate level of safe food across the range, and achieving a significant reduction in the persecution and disturbance of Bearded Vulture.

Five actions are aimed at ensuring the availability of sufficient suitable habitat for Bearded Vultures to breed and forage:

- Identify land uses that should not be permitted within a radius of up to 10 km of nesting and feeding sites.
- Include Bearded Vultures as part of the biodiversity planning and IEM processes by providing spatial data and land use guidelines.
- Ensure authorities are aware of the need to i) inform the BVTF of proposed developments and activities in the Bearded Vulture range, and ii) provide the BVTF with information obtained on the species through the IEM process as part of a feedback mechanism.
- Contribute to the Vulture Safe Zone process by evaluating the contribution of the process and directing the focus of the implementation to achieve the Recovery programme's objectives.
- Promote the Biodiversity Stewardship Programme by identifying key nesting and foraging areas that are key for Bearded Vulture conservation, and using the tools and opportunities provided to landowners by the programme.

Thirteen actions are aimed at ensuring the availability of an appropriate level of safe food across the range:

- Develop a feeding strategy to ensure that food is not a limiting factor in the survival and productivity of the population through assessing the distribution of feeding sites and type of food provided.
- Implement the feeding strategy and establish feeding sites in strategic locations.
- Maintain an up-to-date feeding site database.
- Revitalise/establish livestock exchange system in Lesotho.
- Ensure operational freezer containers in strategic locations across the range.
- Update, translate and disseminate information on the management of feeding sites and providing safe food.
- Ensure that all environmental authorities are familiar with the location of feeding sites in their area so that they can advise the public on where carcasses can be taken.
- Ensure the development of a formalised approval process before market authorisation is granted for all veterinary NSAIDs.
- Raise awareness among veterinarians and landowners about the dangers of using veterinary products and lead ammunition across the Bearded Vulture range.
- Conduct a survey on the use of NSAIDs and veterinary products.
- Conduct regular lead and other heavy metal (e.g. mercury, cadmium) screening in Bearded Vultures by following the Lead Task Team protocol.
- Determine the incidence of lead in the carcasses available to Bearded Vultures throughout the foraging range.
- Determine the source of the lead in Bearded Vultures.
- Undertake education and awareness around the threat of non-food items (pica) to Bearded Vultures.

Three actions are aimed at achieving a significant reduction in the persecution and disturbance of Bearded Vulture:

- Ensure that national protocols incorporate the needs of Bearded Vultures in terms of limiting disturbance at breeding and feeding sites.
- Ensure that provisions are in place in national legislation to protect Bearded Vulture breeding and feeding sites.
- Engage with relevant stakeholders to stop the direct persecution (shooting) of Bearded Vultures.

6.5 Population monitoring

The monitoring programmes listed below provide information (detailed in this application) on the population size and trend, breeding status, productivity, type and severity of threats and additional data to answer research questions and address knowledge gaps.

- Monitoring of the entire population has been undertaken across the species range since 2000.
- A baseline survey of nest sites withing the species' range was conducted in 2006/2007.
- A survey of all nests across the entire Bearded Vulture range is planned for every 5 years.
- A sample of territories is monitored annually for breeding activity.

- A sample of nest sites is monitored three times per year during the incubating, hatching and fledging period to determine breeding productivity.
- Nest sites are monitored following access/ disturbance to establish breeding success and site fidelity.
- The effectiveness of actions implemented to reduce the disturbance to nesting birds will be monitored after implementation.
- Current monitoring programmes are designed to include the measures that can be used to determine the impacts of global climate change.
- A sample of individuals have been marked and their movements monitored to establish their ranging behaviour, causes of mortality and the effectiveness of conservation interventions.
- Monitoring is being undertaken at supplementary feeding sites.
- Lead levels in the population are monitored by testing bones from dead individuals.

7. Effects of the proposed amendment

7.1 Anticipated benefits of the amendment

Appendix I of the CMS comprises migratory species that have been assessed as being in danger of extinction throughout all or a significant portion of their range. The southern African Bearded Vulture population is a small, isolated population that is currently declining and is listed as Critically Endangered regionally. Globally the species is listed as Near Threatened, and this international status does not serve the regional status of the species.
Including the southern African Bearded Vulture *Gypaetus barbatus meridionalis* in Appendix I, while retaining its listing in Appendix II, is anticipated to increase cooperation between the two Range States, non-governmental organisations and other stakeholders and concerned parties to address the threats to the species and improve the conservation status of the species. It may increase awareness internationally of the regional status of the population and its unique genetic structure, thereby increasing the success of funding applications aimed at implementing the actions to achieve the species conservation targets.

The uplisting to Appendix I is another tool to aid in the protection of the species because it prohibits the taking of such species; promotes conserving and where appropriate restoring their habitats; prevents, removes or mitigates obstacles to their migration (in this case across the border between Lesotho and South Africa); and controls other factors that might endanger them. Although the species is already protected at a national level in both countries, the uplisting increases the profile of the population and ensures protection at an international level. The southern African sub-population is genetically distinct and should be managed as such. The uplisting will enforce consideration of the species' needs in decision-making processes by environmental authorities in South Africa.

Since the species is migratory, it is anticipated that the entire population will benefit from any additional protection that is afforded to this migratory species in South Africa.

7.2 Potential risks of the amendment

None

7.3 Intention of the proponent concerning development of an Agreement or Concerted Action

Concerted action will be undertaken by the Government of South Africa through the implementation of the Bearded Vulture Recovery Strategy & Action Plan, as well as the National Biodiversity Management Plan for South African Vultures (in prep).

The objectives detailed in the Bearded Vulture Recovery Strategy & Action Plan will be achieved through the joint implementation of actions with partners in the range state of Lesotho. This implementation is facilitated though a Bilateral Memorandum of Agreement and is endorsed by the Bilateral Coordinating Committee of the Maloti Drakensberg Transfrontier Programme.

8. Range States

The only two Range States affected by this proposal are South Africa and Lesotho. South Africa is a CMS Party Range State, whereas the Kingdom of Lesotho is a Range State, but not a CMS Party.

9. Consultations

The proposal is supported by the Bearded Vulture Task Force (the Steering Committee of the Bearded Vulture Recovery Programme) that is represented by the following organisations:
The Department of Forestry Fisheries and the Environment (Transfrontier Conservation Areas Unit, Biodiversity Management Unit), BirdLife South Africa, Enviro-Rural Solutions, the Endangered Wildlife Trust (Birds of Prey Programme and Vultures for Africa Programme), Raptor Rescue, African Raptor Trust, Bearded Vulture Breeding Programme, SANParks, Ezemvelo KZN Wildlife, African Conservation Trust, Wildlife ACT, Department of Economic Development, Environmental Affairs and Tourism, Eastern Cape Parks and Tourism Agency and the Department of Environment, Lesotho.

BirdLife South Africa, IUCN Species Survival Commission Vulture Specialist Group, Lesotho Highlands Development Authority (LHDA), the Biodiversity and Protected Area Working Group of the Maloti Drakensberg Transfrontier Programme and the National Coordination Committee of the Maloti Drakensberg Transfrontier Programme were also consulted and provided letters of support.

The CMS non-Party Range State (Lesotho) has been consulted on this listing proposal and has provided a letter of support.

10. Additional remarks

The southern African Bearded Vulture is key part of our ecosystem, and our natural heritage, and is an iconic symbol for the Maloti-Drakensberg Transfrontier Programme. Both Lesotho and South Africa are committed to the protection of this migratory species and South Africa will value any additional protection status that will safeguard this species.

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