NT Bearded Vulture *Gypaetus barbatus*

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Justification

Justification of Red List Category
This species has been listed as Near Threatened owing to evidence that is has undergone a moderately rapid population decline over the past three generations.
While the population in some parts of the range has been stable or increasing due to conservation action, reductions are suspected to be rapid in parts of the Himalayas and India, and in the isolated South African population. Declines are attributed to non-target poisoning, including from diclofenac, but also direct mortality due to collisions with energy infrastructure, increased disturbance and a reduction in food availability.

Population justification
Ferguson-Lees *et al*. (2001) estimated the population to number 1,000-10,000 individuals, but in Europe the population is estimated at 630-960 pairs, which equates to 1,260-1,920 mature individuals, or roughly 1,890-2,880 individuals (BirdLife International *in prep.*). The population in Nepal was estimated at c.500 individuals in 2010 (K. Paudel and T. Galligan *in litt*. 2014). In Iraq, there may be fewer than 20 pairs (R. Porter *in litt*. 2013), with less than 100 mature individuals in the Arabian Peninsula (Symes *et al.* 2015). There are estimated to be a few hundred pairs in Ethiopia (I. Angelov *in litt*. 2011). In 2011, there were only three nest-sites known in Kenya, and six or more in Tanzania, with the population in Uganda unknown, although there was evidence of near total loss of the Mt Elgon population (S. Thomsett *in litt*. 2011). There are estimated to be 6-10 pairs in Morocco (Cuzin 2019) but not recent information on its status in Algeria, and it is considered extinct in Tunisia (F. Cuzin *in litt*. 2011). The total population in North Africa is therefore estimated to be c. 8-14 breeding pairs. In southern Africa, including South Africa, the population is estimated at c.100 breeding pairs (S. Krüger *in litt*. 2012). A revised global estimate is therefore 2,500-10,000 individuals, roughly equating to 1,675-6,700 mature individuals.

Trend justification
Population trends vary throughout the species range. The European population has increased since 1980, largely due to conservation actions such as reintroduction programmes (BirdLife International *in prep.*). However, surveys in Upper Mustang, Nepal, recorded a decline of 89.3% in the population along the primary transect during 2002-2014, equating to a decline of >99% over three generations (42.6 years [Bird *et al.* 2020]), suspected to have been caused by diclofenac poisoning (Paudel *et al*. 2016). However, the same study found no evidence of declines in smaller, more remote locations. In the Himalayas of India, there has been a perceived decline in recent years (P. Trivedi *in litt.* 2013). It was once commonly seen in the western and central Himalayas, but in recent years it has not been observed as frequently in the central lower Himalaya, perhaps owing to disturbance (R. Naoroji *in litt*. 2011), and there has been an apparent decline in Uttarakhand since the late 1990s (M. Sharma *in litt*. 2014). Populations in Ladakh and along the high Himalayas are regarded as likely to be secure (R. Naoroji *in litt*. 2011). The frequency of reports of Bearded Vulture sightings in India on eBird declined by c.60% during 2000-2018, indicating a population decline in this area (SoIB 2020). The population appears to be stable in south-eastern Kazakhstan (S. Sklyarenko *in litt*. 2011). In Yemen, the species appears to have declined since the early 1980s (R. Porter *in litt*. 2013). The species's range and population in Turkey also appear to have declined in recent years (K. A. Boyla *in litt*. 2014, BirdLife International 2015). In Armenia, the population has been stable since the 1990s (M. Ghasabyan *in litt*. 2011). In the isolated population in southern Africa, the species's breeding range has declined by about 27% since the early 1980s, with the number of breeding territories declining by 32-51% between 1960-1999 and 2000-2012 (Krüger *et al.* 2014, S. Krüger *in litt*. 2012) due to increased mortality (Kruger *et al.* 2015) and reduced breeding productivity (Kruger & Amar 2017). Overall, it is suspected that the population has declined by 20-29% over the past three generations.

Distribution and population

This species is widely and disjunctly distributed across the Palearctic, Afrotropical and Indomalayan regions, but is very rare in some areas and thought to be in decline overall (Ferguson-Lees and Christie 2001).

In **India**, the species is locally common throughout the Himalayas, from Kashmir to Arunachal Pradesh (R. Naoroji *in litt*. 2011, P. Trivedi *in litt*. 2013). Some altitudinal movements occur during winter, when individuals are occasionally seen as low as 600 m (R. Naoroji *in litt*. 2011). It is a widespread altitudinal migrant in **Nepal** (C. Inskipp and H. S. Baral *in litt*. 2011), with its population in the country estimated at c.500 individuals in 2010 (K. Paudel and T. Galligan *in litt*. 2014). The species is described as rare in **Bhutan** (S. Sherub *in litt*. 2013). In **Iraq**, there may be fewer than 20 pairs (R. Porter *in litt*. 2013), with less than 100 mature individuals in the Arabian Peninsula (Symes *et al.* 2015).

The species is regarded as rare and at high risk in **Egypt** (W. A. L. Ibrahim *in litt*. 2011). There are estimated to be a few hundred pairs in **Ethiopia** (I. Angelov *in litt*. 2011). In 2011, there were only three nest-sites known in **Kenya**, and six or more in **Tanzania**, with the population in **Uganda** unknown, although there was evidence of near total loss of the Mt Elgon population (S. Thomsett *in litt*. 2011). There are estimated to be 6-10 pairs in **Morocco** (Cuzin 2019), but not recent information on its status in **Algeria**, and it is considered extinct in **Tunisia** (F. Cuzin *in litt*. 2011). The total population in North Africa is therefore estimated to be c. 8-14 breeding pairs. In southern Africa, including **South Africa**, the population is estimated at c.100 breeding pairs (S. Krüger *in litt*. 2012).

In Europe, the population has grown in the Alps (with the emergence of new breeding pairs due to a reintroduction project, with 60+ breeding pairs in 2020), and in the Pyrenees, particularly in its central part (Aragon, **Spain**), from its population of 39 pairs in 1994 to c.100 pairs in 2020. In Spain, two reintroduction projects are under way in Andalusia and the Cantabrian Mountains. The total Spanish population was estimated at 115 pairs in 2015 (Izquierdo 2018). The total population in EU countries was estimated at 220-250 pairs in 2020 (BirdLife International *in prep.*) and the total European population was recently estimated at 630-960 pairs (BirdLife International *in prep.*). The population in **Azerbaijan** is estimated at 20-100 pairs and the population in European **Russia** is estimated at 181-237 pairs (Izquierdo 2018). There were thought to be 2-5 individuals in the **Macedonia**-**Greece** and **Bulgaria**-Greece border areas at the turn of the century, however there has been a lack of records in these areas since 2005 (E. Stoynov *in litt*. 2011). In **Turkey**, the population is estimated at around 160-200 pairs (K. A. Boyla *in litt*. 2014, BirdLife International 2015). In **Armenia**, the population is estimated at 15-25 breeding pairs (BirdLife International 2015).

Population trends vary regionally and locally. In the Himalayas of India, there has been a perceived decline in recent years (P. Trivedi *in litt.* 2013). It was once commonly seen in the western and central Himalayas, but in recent years it has not been observed as frequently in the central lower Himalaya, perhaps owing to disturbance (R. Naoroji *in litt.* 2011), and there has been an apparent decline in Uttarakhand since the late 1990s (M. Sharma *in litt.* 2014). Populations in Ladakh and along the high Himalayas are regarded as likely to be secure (R. Naoroji *in litt*. 2011). Steep declines have been recorded in the Upper Mustang region of Nepal recently, with numbers recorded per day and per kilometre decreasing by 73% and 80% respectively between 2002 and 2008 (Acharya *et al.* 2010). The population appears to be stable in south-eastern Kazakhstan (S. Sklyarenko *in litt.* 2011). In Yemen, the species appears to have declined since the early 1980s (R. Porter *in litt*. 2013). The species's range and population in Turkey also appear to have declined in recent years (K. A. Boyla *in litt.* 2014, BirdLife International 2015). In Armenia, the population has been stable since the 1990s (M. Ghasabyan *in litt.* 2011). In southern Africa, the species's breeding range has declined by about 27% since the early 1980s, with the number of breeding territories declining by 32-51% between 1960-1999 and 2000-2012 (Krüger *et al.* 2014, S. Krüger *in litt.* 2012).

Ecology

Behaviour It is resident where it occurs, but has vast home ranges, and juveniles will wander even more widely than adults (Ferguson-Lees and Christie 2001). **Habitat** The species occupies remote, mountainous areas, with precipitous terrain, usually above 1,000 m, though can occur down to 600 m (R. Naoroji *in litt.* 2011, H. Ibrahim *in litt.* 2016), and in particular areas where large predators such as wolves and Golden Eagles are present, and there are herds of mammals such as mountain goats, ibex, and sheep (Ferguson-Lees and Christie 2001). **Diet** The species will forage over vast distances (up to 700 km in one day has been recorded), using a soaring flight. Its principle food is carrion, with its diet including a large proportion of bones (as much as 85%) whereupon the bird gets nutrition from the marrow inside. The rest of its diet comprises tortoises, and occasionally also live mammals and birds. It is generally unwilling to compete with vultures at carcasses, and will wait patiently to feed, scavenging older carcasses if fresh meat is scarce. Bones are either consumed whole, broken using the bill, hammered against the ground, or lifted into the air and dropped from 50-80 m high onto hard rock. Tortoises and hyraxes are generally treated in the same way as bones. It is known to scavenge in rubbish dumps, including urban areas in Ethiopia (Ferguson-Lees and Christie 2001). **Breeding** The species will construct large nests (averaging 1-m diameter), composed of branches and lined with animal remains such as skin and wool, as well as dung and occasionally also rubbish. Nests are located on remote overhung cliff ledges or in caves and will be re-used over the years. Breeding occurs from December to September in Europe and northern Africa; October–May in Ethiopia; May-January in southern Africa; year-round in much of eastern Africa; and December-June in India (Ferguson-Lees and Christie 2001).

Threats

The main causes of on-going declines appear to be non-target poisoning, direct persecution, habitat degradation, disturbance of breeding birds, inadequate food availability, changes in livestock-rearing practices and collisions with powerlines and wind turbines (Ferguson-Lees and Christie 2001, Barov and Derhé 2011, S. Xirouchaki *in litt.* 2012, Izquierdo 2018). Despite the provision of targeted conservation actions, the European population remains susceptible to poisoning, disturbance and mortality caused by powerlines (J. A. Gil Gallus *in litt.* 2011; Izquierdo 2018). Since European reintroductions began, mortality from shooting has decreased, however poisoning (both intentional and accidental) has increased (Margalida *et al*. 2008). Disturbance has also increased due to improved accessibility to mountain sites (Izquierdo 2018). Rapid increases in grazing pressure and human populations in the mountains of Turkey are causing habitat degradation there (S. Viter *in litt*. 2014). Suitable habitat is also threatened by pipeline construction through the Caucasus mountains (S. Viter *in litt*. 2014). In parts of

the range where transhumance occurs, there may be asymmetries in food availability at different times of year (Margalida *et al.* 2018). Three of five failed eggs of this species and four dead nestlings sampled in the Spanish Pyrenees from 2005-2008 had high concentrations of multiple veterinary drugs (especially fluoroquinolones) and evidence of several livestock pathogens (Blanco and Lemus 2010). The recent approval for commercialisation of veterinary diclofenac in Spain may have devastating effects on European vultures - in 2020 a Cinereous Vulture was confirmed as the first individual to die from veterinary diclofenac in Europe (BirdLife 2021). Lead poisoning may also be a significant threat in Europe (Izquierdo 2018).

In South Asia, the most significant potential threat may be from diclofenac, a non-steroidal anti-inflammatory drug (NSAID) used in livestock and responsible for catastrophic declines in three of the region's *Gyps* species since the 1990s, through ingestion at contaminated carcasses and resultant kidney failure (reviewed by Das *et al*. 2010). The species is primarily a bone-eater, and it is not known if diclofenac residues remain within bones of treated animals, although residues are known to be passed into feathers and hair; however, the local collapse in *Gyps* species could allow this species to access and feed on soft tissues from which it would have been excluded (C. Inskipp and H. S. Baral *in litt*. 2013).

In the Himalayas of India, the species may be impacted by the increase in feral dogs, which potentially compete for food (P. Trivedi *in litt.* 2013). Rapid increases in grazing pressure and human populations in the mountains of Iran, Afghanistan, Iraq, Turkey and western Pakistan are causing habitat degradation in these countries (S. Viter *in litt.* 2014). Suitable habitat is also threatened by pipeline construction through the Altai and Caucasus mountains, and powerline construction is planned from Tajikistan through Afghanistan to Pakistan and India (S. Viter *in litt*. 2014). In parts of Nepal at least, the species may suffer from the collection of nestlings, as they are seen by local people as a good omen for prosperity, as well as the destruction of nests to reclaim human-made materials such as rope and fabrics, and hunting pressure driven by the use of the species's intestines in traditional medicine (Acharya *et al.* 2010, K. Paudel and T. Galligan *in litt*. 2014). The use of herbicides, insecticides and fungicides may also have impacts on the species (Acharya *et al*. 2010). However, a rapid decline reported from the Upper Mustang Valley in Nepal is suspected to have been caused by diclofenac poisoning (Paudel *et al.* 2016).

In Africa, the most prevalent threats to scavenging birds are poisoning and collision with power lines (Krüger 2015, S. Thomsett *in litt.* 2011). The species is threatened by the construction of powerlines and wind farms in the highlands, which increases the likelihood of territorial abandonment, and the use of poisons to control dogs at refuse tips (Rushworth and Krüger 2014, Krüger 2015, I. Angelov *in litt*. 2011). Simmons and Jenkins (2007) suggested that population trends in this species in southern Africa may be correlated with climate trends. Better access to the highlands of Lesotho may be increasing the rate of anthropogenic disturbance of the species there (Krüger 2015). The species may also be hunted in Africa for food, as well as for its use in traditional medicine (Krüger 2015, W. Goodwin *in litt.* 2016). Lead poisoning may pose an additional threat (Kruger & Amar 2018). Despite the threat of habitat degradation, the species has been noted to adapt to and nest in modified landscapes, such as in Ethiopia (S. Thomsett *in litt*. 2011).

Conservation actions

Conservation Actions Underway

CITES Appendix II. EU Birds Directive Annex I. CMS Appendix II. Raptors MOU Category 1. A Multi-species Action Plan for African-Eurasian Vultures has been produced (Botha *et al.* 2017). In Europe, captive breeding and reintroduction programmes have been carried out in the Austrian, French, Italian and Swiss Alps with individuals subsequently spreading into other parts of France (Snow and Perrins 1998, Frey and Walter 1989). Reintroduction programmes are underway in parts of Spain (J. A. Gil Gallus *in litt.* 2011). Feeding stations have been provided in the Pyrenees with resulting increases in numbers of the species, and the provision of similar stations across the species's range could improve its global population density (Ferguson-Lees and Christie 2001). However, while these have helped to increase population growth and individual survival, they can have negative impacts on vultures; for instance they can lead to habitat saturation, with individuals' territories overlapping at these areas, and can lead to reduced productivity (Carrete *et al.* 2009, Gil *et al.* 2014). For example, the reintroduced population in the Central Alps increased exponentially between 1998 and 2015, but due to a high level of philopatry there has been little dispersal away from the initial release site, resulting in a high density of breeding pairs in the core area (Jenny *et al.* 2018). Habitat saturation may also lead to polygyny (Gil *et al.* 2017). Supplementary feeding in poor-quality territories and extraction of the extra young produced has successfully been used as a cheaper alternative to captive breeding for reintroduction programmes (Ferrer *et al.* 2017), however there are concerns that this may negatively impact the population from which the young are extracted (Margalida *et al.* 2017). A reintroduction programme was attempted in Kenya in 1999-2003 (S. Thomsett *in litt.* 2011). The species is monitored in Southern Africa, with an annual count day which not only aids in the monitoring of the species, but also raises awareness (Krüger 2015). A Single Species Action Plan for the conservation of the Western Palearctic population of Bearded Vulture was published in 2018 (Izquierdo *et al.* 2018).

Conservation Actions Proposed

Conduct coordinated surveys to monitor the species's global population trend. Assess the threat posed by diclofenac and other drugs used in livestock, as well as the impacts of climate change and feral dogs. Reduce disturbance in and around nesting areas. Mitigate against the impacts of wind turbines and powerlines. Combat the threat of persecution through laws and awareness-raising activities. Provide feeding stations throughout the species's range. Try to address the illegal trade and use of vultures in medicine (Krüger 2015). Assess methods of negating the negative impacts that result from feeding stations (see Carrete *et al.* 2009, Moreno-Opo *et al.* 2015).
The Single Species Action Plan for the conservation of the Western Palearctic population of Bearded Vulture, *Gypaetus barbatus barbatus*, (2018) was prepared in the framework of the EuroSAP (LIFE14 PRE/UK/000002) LIFE project, produced by Vulture Conservation Foundation and co-ordinated by BirdLife International. It provides a comprehensive programme of research and conservation measures needed to conserve this species in its European range. As well as the actions mentioned above, it highlights the threat of lead poisoning, the need for collaboration with farmers to mitigate livestock-wildlife conflicts and the need to do more to conserve genetic diversity, including through creating a captive genetic reservoir.

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