TOWARDS A CONSERVATION PLAN FOR THE CAPE GRIFFON *GYPS COPROTHERES*: IDENTIFYING PRIORITIES FOR RESEARCH AND CONSERVATION ACTION

André F. Boshoff and Mark D. Anderson

Centre for African Conservation Ecology
Nelson Mandela Metropolitan University
Port Elizabeth

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REPORT FROM A WORKSHOP HELD AT PRINGLE'S INN, HARRISMITH, FREE STATE PROVINCE, SOUTH AFRICA, ON 12 MARCH 2006

André F. Boshoff
Centre for African Conservation Ecology
Nelson Mandela Metropolitan University
Port Elizabeth, South Africa

and

Mark D. Anderson
Department of Tourism, Environment and Conservation
Northern Cape Provincial Government
Kimberley, South Africa

In association with the Vulture Study Group, a sub-group of the Birds of Prey Working Group, Endangered Wildlife Trust, Johannesburg, South Africa

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1. Executive Summary

Despite over 30 years of research and conservation attention, the global range and population of the Cape Griffon (= Cape Vulture) *Gyps coprotheres*, a threatened southern African endemic, continues to decrease. The main reason for the lack of success by conservationists in, at least, stabilizing the population is considered to be the absence of an overall sub-continental conservation plan for the species, resulting in attempts to conserve the species being fragmented, uncoordinated and not priority driven (i.e. non-strategic). As a first step towards the compilation and implementation of a conservation plan, an expert workshop was held with the overall aim of strategically identifying research and conservation priorities, and kick-starting a process to compile and implement a workable conservation plan.

A small group of 21 persons, including an independent facilitator, was invited to attend the workshop. The 20 participants represented a range of conservation and scientific interests; geographical coverage of participants was also addressed in the selection process. Background information was provided to participants beforehand, to enable them to prepare for the workshop, using their knowledge of the formal and grey literature, and their field experience.

Consensus was reached on the conservation goal, namely "to stabilise the Cape Griffon population". Sixteen mortality factors were listed, and for each of these the current scenario (e.g. what is known, what is not known), research requirements and proposed conservation actions were discussed and briefly captured in a matrix. Following this exercise, 16 participants were accorded 16 votes (= the total number of mortality factors) and asked to allocate them as they saw fit, to one or more of the 16 factors, according to the perceived relative importance of each factor. Addressing **the decrease in the amount of carrion was overwhelmingly regarded as the highest priority for conservation action**. Addressing the issues of **inadvertent poisoning** and **electrocution on electricity structures** formed the next clear grouping of factors, followed by a group comprising **exposure to agrochemicals**, **loss of foraging habitat** and **unsustainable harvesting** of birds for traditional uses.

An appropriate monitoring and evaluation (M&E) programme, to track demographic changes in relation to conservation actions, and to detect the emergence of new threats, needs to be designed and implemented. However, the operation of an M&E programme will be largely meaningless unless "on-the-ground" conservation actions are implemented, as a priority.

Since some 18 "core" colonies hold about 80% of the Cape Griffon population, conservation action should be focused on them. A Cape Griffon Task Force (CGTF), comprising a group of core colony "champions", will be established, its overall role being to drive the implementation of the conservation plan, principally by planning and overseeing the micro-management of each of the 18 colonies and their respective foraging areas, and to exercise accountability for the effectiveness of the implementation of the plan. Action plans for individual core colonies must be closely guided by the outcomes of this workshop. The Birds of Prey Working Group will render assistance to the CGTF by providing a co-ordinating role, providing interim administrative support, and investigating the funding and appointment of a full-time or part-time CVTF co-ordinator.

2. Introduction

The Cape Griffon (= Cape Vulture) *Gyps coprotheres*, an endemic species to southern Africa (Piper 2005), is classified as "Vulnerable" in the *The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland* (Anderson 2000). Since concern was first expressed, in the 1960s and early 1970s, for its conservation status by scientists and conservationists, this species has been the subject of relatively intensive and extensive research and conservation action (see Mundy *et al*. 1992). To date (2006), this has produced some 1700 research papers, reports and popular articles (S.E. Piper pers. comm.). These items deal with a wide range of topics, ranging from the species' biology and ecology to surveys of breeding sites, sightings and mortality reports, articles to promote awareness of the species' plight, and guidelines to farmers for reducing unnatural mortality. Notwithstanding all this attention, the species has continued to decline in range and numbers. The extent of this decline, and the factors that have contributed to it, are briefly summarized in Mundy *et al*. 1992, Mundy *et al*. 1997 and Anderson (2000). Factors contributing to the decline include shortage of food, inadvertent poisoning, electrocution on powerlines and drowning in high-walled farm water reservoirs. A range of research and issues relating to the conservation of the Cape Griffon are described and discussed in Boshoff *et al*. (1997), Anderson *et al*. (2004) and Monadjem *et al*. (2004).

In contrast to the Cape Griffon scenario, research and follow-up actions aimed at conserving a congener, the Eurasian Griffon *Gyps fulvus*, in Spain and France have been successfully implemented (e.g. Camiña 2004; Donázar 1993; Slotta-Bachmayr *et al*. 2004.); this species occupies an environment, and faces pressures, very similar to those affecting the Cape Griffon in southern Africa. Another Old World vulture species for which a co-ordinated conservation plan has been in place for some time is the Cinereous Vulture *Aegypius monachus* (Tewes 1998; Tewes *et al*. 2004).

We contend that the main reason for the lack of success by conservationists in stabilizing - and even increasing - the Cape Griffon population is considered to be the absence of an overall and formal sub-continental conservation plan for the species, resulting in attempts to conserve it being fragmented, uncoordinated and not priority driven (i.e. non-strategic). In the present context, we consider that a "plan" must have a specific, measurable and attainable goal, an explicit and feasible set of on-the-ground actions, and a well defined monitoring and evaluation component. The lack of a plan for the Cape Griffon has resulted in sub-optimal use of scarce resources (people, funds, equipment) in efforts to turn the species' fortunes around. To our knowledge, only one conservation plan has been compiled and implemented for the species – namely one to halt the decline in the breeding colony on Potberg Mountain in De Hoop Nature Reserve, in the Western Cape Province of South Africa (Boshoff & Robertson 1985). This plan, implemented in concert with a farmer extension programme (Scott *et al*. 2000), succeeded in its primary aim, namely to improve the survival rate of first-year birds (Piper *et al*. 1999). However, this plan addresses the conservation of only this single sub-population.

There is clearly an urgent need for a strategic conservation plan for the Cape Griffon. To address this requirement, an expert workshop was held to identify priorities for research and conservation action, as a first step towards the compilation and implementation of a focused conservation plan for the species. This document summarises the main outcomes of this workshop. It provides a concise account of the factors that are impacting on the Cape Griffon, and briefly describes the research and conservation actions, for each factor, that are considered to be priorities for reversing its progressive decline.

3. Approach taken

Owing to a lack of comprehensive, systematic and quantitative data and information, it is very difficult to place the various pressures that impact on the Cape Griffon into perspective. Whilst good information exists for certain factors, for others relatively little is known. We therefore followed an approach that involves exploring and documenting the collective views and knowledge of persons who are active in one or more of the following fields, insofar as they may impact on the conservation of Cape Griffon: raptor research and conservation, vulture biology, ecology and conservation, ecosystem science, conservation research and management, and environmental education.

A small group of 20 people, who individually and collectively met the above requirements, was invited to the one-day workshop. A further criterion in selecting participants for the workshop was the achievement of good geographical representation within the historical range of the Cape Griffon. The number of participants was limited in order to promote focused and effective discussion, and to facilitate the reaching of consensus on key issues. The workshop was facilitated by Rick Watson of The Peregrine Fund, who, although familiar with raptor conservation issues internationally (and in southern Africa), has not been intimately involved in Cape Griffon work in southern Africa, and his involvement was therefore considered to be unbiased and objective.

The objectives of the workshop were to:

a) compile a comprehensive list of the known and suspected factors that are, or may be, contributing to the decline of the species,

b) document the current status, patterns and trends of the factors that are listed in (a) above,

c) identify those factors for which there is considered to be sufficient information available to be able to plan and implement conservation actions, i.e. no additional research is required prior to implementation of conservation actions,

d) identify those factors for which highly focused additional short- to medium-term research is considered necessary, prior to conservation actions being planned and implemented,

e) identify those factors for which action is simply not feasible (e.g. owing to lack of resources, or for practical, technical, or other, reasons),

f) identify priority practical conservation actions, based on the outcomes of (a)-(d) above, with the known or potential positive and negative impacts of each proposed action listed, where possible, and

g) identify a suitable person/organisation, and mechanisms, to co-ordinate/facilitate the completion of the conservation plan and to manage its implementation phase (including the monitoring and evaluation component). This person/organisation would be expected to investigate potential funders of the implementation phase.

4. Methods

Participants were provided, beforehand, with (a) the background to the workshop, (b) the list of aims of the workshop (above), and (c) a provisional list of factors that were known to, or suspected to, impact negatively on the species in question. They were then requested to draw on their knowledge of the literature, and particularly on their own personal knowledge and experience, to address the aims of the workshop.

As a first step, an overall goal for the conservation plan was compiled.

At the workshop itself, a draft matrix, incorporating a provisional list of mortality factors, and draft cell entries describing the current scenario, research requirements and proposed conservation actions, was projected onto a wall. Through the independent facilitator, participants accepted or modified the cell contents of the matrix, based on their pre-workshop preparation and discussion that ensued at the workshop. Following the completion of the matrix, a simple procedure was used to rank the mortality factors, according to their perceived level of importance. Each participant was accorded a maximum number of votes, which tallied with the total number of factors listed (16); in the ranking procedure they used their vote allocation, per factor, as they saw fit.

5. List of participants

The list of participants at the workshop is provided in Table 1.

Table 1: Participants at the Cape Griffon conservation plan workshop, listed alphabetically, by surname.

Name	Organisation	Email
David Allan	Natural Science Museum, Durban, South Africa	alland@durban.gov.za
Mark Anderson	Department of Tourism, Environment & Conservation, Northern Cape Provincial Government, Kimberley, South Africa	manderson@half.ncape.gov.za
Patrick C Benson	School of Animal, plant and Environmental Sciences, University of the Witwatersrand, Johannesburg, South Africa	pbenson_rsa@yahoo.com
André Boshoff	Terrestrial Ecology Research Unit, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa	andre.boshoff@nmmu.ac.za
Wendy Borello	Gaborone, Botswana	borello@sharps.co.bw
Remi Borello	Gaborone, Botswana	remib@sharps.co.bw
André Botha	Bird of Prey Working Group, Endangered Wildlife Trust, Johannesburg, South Africa	andreb@ewt.org.za
Brian Colahan	Department of Tourism, Environment & Economic Affairs, Free State Provincial Government, Bloemfontein, South Africa	colahan@dteea.fs.gov.za
Andrew Jenkins	Percy FitzPatrick Institute for African Ornithology, University of Cape Town, South Africa	ajenkins@botzoo.uct.ac.za
Hayley Komen	Bird of Prey Working Group, Endangered Wildlife Trust, Johannesburg, South Africa	hayleyk@ewt.org.za

Sonja Kruger	Ezemvelo KwaZulu-Natal Wildlife, Pietermaritzburg, South Africa	ianr@kznwildlife.com
Peter Mundy	National University of Science & Technology, Bulawayo, Zimbabwe	mundy@gatorzw.co.za
Steven Piper	Ornithological Support Services, Underberg, KwaZulu-Natal, South Africa	vulture@telkomsa.net
Ian Rushworth	Ezemvelo KwaZulu-Natal Wildlife, Pietermaritzburg, South Africa	skruger@kznwildlife.com
Ann Scott	Raptors Namibia, Swakopmund, Namibia	ecoserve@iway.na
Mike Scott	Raptors Namibia, Swakopmund, Namibia	ecoserve@iway.na
Kevin Shaw	Western Cape Nature Conservation Board, Stellenbosch, South Africa	shawka@cncjnk.wcape.gov.za
Rick Watson	The Peregrine Fund, Boise, Idaho, USA	rwatson@peregrinefund.org
Craig Whittington-Jones	Department of Agriculture, Conservation & Environment, Gauteng Provincial Government, Johannesburg, South Africa	craigw@gpg.gov.za
Kerri Wolter	De Wildt Cheetah & Wildlife Trust, De Wildt, South Africa	vulture@dewildt.org.za

Gerhard Verdoorn (BirdLife South Africa), Maria Diekmann (REST [Rare & Endangered Species Trust], Namibia), and Chris Van Rooyen (Eskom-Endangered Wildlife Strategic Partnership, Johannesburg), were invited to the workshop but were unable to attend; they were invited to comment on a penultimate draft of this document, as were all workshop participants.

6. Conservation goal

The agreed goal for the conservation plan is:

***"To stabilize the (global) Cape Griffon population"*.**

This goal must be revisited and re-assessed after periods of five and ten years.

7. Matrix

The completed matrix is provided as Table 2. The following acronyms are used in Table 2:

EWT	Endangered Wildlife Trust
BoPWG	Birds of Prey Working Group (EWT)
RCG	Raptor Conservation Group (EWT)
VSG	Vulture Study Group (EWT)
PWG	Poison Working Group (EWT)
SANBI	South African National Biodiversity Institute
GIS	Geographical Information System
EIA	Environmental Impact Assessment
SEA	Strategic Environmental Assessment

Table 2: Mortality factors affecting the Cape Griffon population in southern Africa: current scenario, research requirements and proposed conservation actions. Order of listing is not based on a quantitative ranking.

A No.	B Mortality factor	C Current scenario	D Research requirements	E Proposed conservation actions
1	Loss of foraging habitat.	Actual and potential foraging habitat has been reduced in large areas as a result of changes in land cover (land-use, transformation, degradation). Some areas are relatively intact, others are heavily transformed or degraded by intensive agriculture, cultivation, urbanization, roads, dams, mines, desertification, bush encroachment, afforestation, alien vegetation. Climate change is expected to modify existing habitats; potential effects on vultures unknown at this stage. Additional habitat is provided in some areas through bush clearing; this is not ecologically defensible, unless it is bush encroachment reversal. Restoration/rehabilitation of some areas is taking place. In South Africa, large colonies in or adjacent to degraded communal rangelands have persisted. Loss of suitable foraging habitat is considered a limiting factor for re-colonisation of historical range.	A GIS study is required to quantify foraging habitat loss, but this is not considered a prerequisite for implementing the proposed conservation actions.	Urge governments of southern African countries to rigorously apply soil conservation and biodiversity legislation. Approach the national agriculture and environmental departments in this regard. In South Africa, SANBI should be engaged. Request that SEAs and EIAs take the ecological needs of vultures into account. The above actions are aimed at protecting the remaining intact, or near intact, foraging habitat. Foraging habitat will be increased in areas where bush encroachment, or other land degradation, is reversed.
2	Lack of roosting and breeding sites.	All or most historical breeding and roosting sites are considered to still be available. Thus, a lack of such sites is not considered a limiting factor for the re-colonisation of the historical range, or for local population growth.	No additional research is required, other than to locate and document, on an opportunistic basis, previously unknown sites. A published inventory of all roost and breeding sites is urgently required.	Currently active and abandoned roosting and breeding sites must be recognised by SEAs and EIAs. Abandoned sites will be important should re-colonisation of the area occur. Roost and breeding site data must be easily accessible to SEA/EIA practitioners and bioregional planners.

A No.	B Mortality factor	C Current scenario	D Research requirements	E Proposed conservation actions
3	Lack of surface water.	Vultures use water for drinking and bathing. Earth dams and high walled reservoirs have been constructed on farms, thereby increasing possibilities for making water available. Many natural sources of surface water are still present and accessible. Thus, a lack of water is not considered a limiting factor for re-colonisation. However, high-walled reservoirs are known to cause mortality, and vultures sometimes pollute livestock drinking places and farmers may retaliate.	Not considered a research priority.	Provide land-owners and land custodians with existing guidelines to create safe vulture drinking and bathing places at vulture "restaurants", and to modify high-walled reservoirs to avoid or reduce drowning incidents.
4	Food quantity: decrease in the amount of carrion	It is strongly suspected that there is a general decrease in the amount of carrion available to the vultures, and the capacity of the current food base to support the current population is in doubt. This situation is considered to have arisen from a combination of land-use changes (e.g. wild game to livestock, small-livestock to large-livestock, livestock to fenced game), improved husbandry and farm management practices, hungry people (especially in communal areas), and competition from increased populations of other animal scavengers (dogs, crows). A shift from livestock to game, and from livestock to eco-tourism, may increase the carrion supply, but this hypothesis requires testing. Game farmers strive for the low game mortality rates, as do stock farmers. An overall shortage of carrion may be a key limiting factor for population growth and re-colonisation of historical range. This hypothesis requires testing.	Research is urgently required to investigate spatial and temporal patterns and trends in the availability of carrion, based on a comparison between land-use types. Data on stock and game mortality rates, and carcass disposal, in identified targeted areas, is required. Tracking of marked birds to investigate food type and foraging areas is very useful for planning local conservation action, and should be conducted at core colonies where resources permit. Tracking studies are currently being conducted in Namibia. However, tracking studies are not a prerequisite for conservation action. It is not feasible to conduct tracking studies at all core colonies, prior to conservation action; foraging movements can be predicted from current knowledge.	In parallel with the research programme (column D), the provision of carrion by land-owners, through the operation of "restaurants" and the leaving of uncontaminated carcasses in the veld, should be promoted. A proliferation of properly managed "restaurants", and the leaving of uncontaminated carcasses in the veld, will potentially increase the amount, and regular supply, of (safe) carrion available to the vultures. Practical guidelines for the establishment and operation of a "restaurant" must be made available to land-owners. However, there are a number of practical problems associated with feeding sites and these must be addressed. In addition, these sites may promote dependence on an unreliable and possibly contaminated (poisons, agro-chemicals, lead from bullets) source of carrion. Loss of natural foraging ability may occur. The positive and negative impacts of a supplementary feeding programme must be closely monitored and evaluated.

A No.	B Mortality factor	C Current scenario	D Research requirements	E Proposed conservation actions
5	Food quality: variation in carcass composition	It is suspected that variations in carcass composition (species/type, seasonal availability and body condition) may negatively influence food quality, thereby causing periods of food stress for the vultures.	This information may already be available from agriculture departments, and locally from abattoirs. Not considered a research priority at this stage, but locally data should be collected, even on an opportunistic basis.	Research outcomes can inform "restaurant" provisioning schedules (e.g. increase carrion supply during food stress periods)
6	Food quality: shortage of bones	The possible causes and effects of a shortage of bones in the birds' diet has been researched. Bones, ingested as fragments, contain important elements and nutrients and a shortage thereof in the vultures' diet can lead to skeletal abnormalities that, in turn, can impact on their survival rate. An overall reduction of suitably-sized carcasses, and mammalian bone crushers, on the land will exacerbate the bone shortage problem.	Some international research is being conducted on this topic. Cliff bases at key colonies should be searched for evidence of skeletal abnormalities. This is not a prerequisite for the implementation of the proposed conservation actions.	Promote the provision of bone fragments at "restaurants" and on farms. Provide practical guidelines to landowners. The use of the fragments by the vultures should be monitored.
7	Food quality: inappropriate food items (pica).	Vultures are known to collect non-organic food items, which cache in their crops, and are fed to their nestlings; this can lead to adult and nestling mortality, predominantly the latter. The prevalence and trend of this factor is unknown.	Opportunistic data collection is required to obtain further information about this factor, e.g. post-mortem data, non-food material at nests. This is not a prerequisite for the implementation of the proposed conservation actions.	Remove non-food items at "restaurants" (e.g. from the stomachs of cattle), and from nests during ringing operations.
8	Contaminated food: inadvertent poisoning	The use of poisoned bait and carcasses to combat mammalian and avian predators and scavengers is still widespread and is considered to be a significant and ongoing mortality factor in many areas. However, the overall extent and trend of this factor is unknown, and its impact is difficult to measure. The PWG has been active for 12 years but its degree of success in reducing the level of vulture poisoning incidents is not known. An apparent increase in the use of poisons to control feral dogs (and possibly crows) in KwaZulu-Natal has been reported. Unrecovered lead bullets also pose a contamination threat. On the positive side, the widespread shift from small-livestock to large-livestock, and from livestock to game, may reduce the use of poison for predator control.	There is a need to establish whether farmers' attitudes and management actions have changed since the formation and activities of the EWT, the VSG and the PWG. Which aspects of the work of these groups has been a success? What lessons can be learnt? Collecting this information is not a prerequisite for implementing the proposed conservation actions.	Intensify a high profile and ongoing awareness and education campaign. Liaise with agriculture departments regarding improved implementation of national legislation. Provide extant practical guidelines to land-owners, and promote integrated problem animal management programmes.

A No.	B Mortality factor	C Current scenario	D Research requirements	E Proposed conservation actions
9	Contaminated food: exposure to agro-chemicals	Considered to be an ongoing, underestimated, and possibly increasing, threat. The effects of known agro-chemicals (e.g. growth hormones and other growth stimulants, antibiotics) are not yet fully understood and new ones are regularly entering the market. NSAIDs (non-steroidal anti-inflammatory drugs) are a particular source of concern.	The introduction and impact of new, potentially harmful, chemicals on productivity and mortality needs to be researched and monitored. However, this does not preclude the immediate implementation of conservation actions to reduce the impacts of known and potentially harmful new products. Efforts must be made to encourage veterinarians to conduct post-mortems on sick and dead vultures.	Intensify a focused awareness and education campaign, accompanied by the provision of appropriate practical guidelines for reducing exposure of vultures to chemically contaminated carcasses. Involve the veterinary profession, in the public and private sectors, in this campaign.
10	Electrocution on electricity transmission structures	This is an ongoing cause of mortality, the prevalence and trend of which is difficult to quantify. Accelerated rural electrification programmes in southern Africa in the last 30 years have significantly increased this threat. In South Africa, Eskom has implemented some mitigation actions - new lines have vulture-safe pylon structures, and pylon modification, in response to mortality incidents, has been carried out in places. However, 1000s of km with unsafe structures still exist and they provide a continuing cause of mortality. Unsafe structures are still being erected in Namibia.	Although practical mitigating solutions exist, and only require widespread implementation, the huge scope of the problem, and the high cost of mitigation, requires research to identify priority areas, and also to place this factor into a broader perspective. Research is being conducted in the Eastern Cape, South Africa.	Implement, or intensify implementation of, existing mitigating procedures, informed by the research described in column D. SEAs and EIAs for new powerlines must address the needs of vultures. Engage with conservation agencies regarding the enforcement of legislation concerning protected species. VSG should publicise each electrocution incident to highlight the role of electricity supply utilities in causing vulture mortality.
11	Collision with electricity cables (conductors) and tower guy wires	This is an ongoing mortality factor, the prevalence and trend of which is difficult to quantify. Less of a problem than electrocutions. Accelerated rural electrification programmes in southern Africa in the last 30 years have significantly increased this threat. In South Africa, Eskom has implemented some mitigation action – attaching conductor markers in some high collision risk areas. However, 1000s of kms of unmarked conductors exist and they provide a continuing cause of mortality. Unsafe conductors are still being erected in Namibia.	Although practical mitigating solutions exist, and only require widespread implementation, the huge scope of the problem, and the high cost of mitigation, requires research to identify priority areas, and also to place this factor into a broader perspective. Research is being conducted in the Eastern Cape, South Africa.	Implement, or intensify implementation of, existing mitigating procedures, informed by the research described in column D. SEAs and EIAs for new powerlines must address the needs of vultures. Engage with conservation agencies regarding the enforcement of legislation concerning protected species. VSG should publicise each electrocution incident to highlight the role of electricity supply utilities in causing vulture mortality.

A No.	B Mortality factor	C Current scenario	D Research requirements	E Proposed conservation actions
12	Direct persecution	There is some anecdotal evidence that some members of the farming community deliberately kill vultures, in retaliation for stock deaths and for fouling of drinking troughs, but no firm evidence exists. There have also been reports of deliberate poisoning to obtain vulture parts for traditional uses (see 14). The prevalence and trend of this factor is unknown.	Data on alleged persecution by some livestock farmers should be opportunistically collected. However, this research is not a prerequisite for implementing conservation actions.	Address this factor via an intensified awareness and education campaign. Interact with farmers, farmers' associations and traditional healers. Provide guidelines to farmers and land custodians to reduce potential conflict situations. Increase awareness amongst traditional healers that the population level is such that it cannot absorb ongoing harvesting, through direct persecution or removal of nestlings.
13	Drowning in high-walled farm reservoirs	Current prevalence and trend unknown, but still considered to be an important factor. Some reduction in the number of incidents may have occurred in the wake of a VSG/BoPWG awareness and information campaign; this has not been monitored. Many unmodified reservoirs continue to pose a threat.	Conservation and agricultural extension officers can obtain information on the extent of the problem, and on the impact of the VSG/RCG campaign. However, this research is not a prerequisite for implementing conservation actions.	Intensify the awareness and education campaign, including the provision of practical guidelines for making high-walled reservoirs safe.
14	Unsustainable harvesting of birds for traditional uses (see also 12)	Birds are directly poisoned, or harvested from breeding sites. The prevalence and trend of this mortality factor is unknown; it is considered an underestimated factor that has possibly increased in recent years. Potentially a serious threat, especially in the case of easily accessible colonies.	There is need to quantify and develop an understanding of the origin, extent, patterns, trends and impact of this factor. Socio-anthropological studies are required to determine reasons for the use of vultures. However, this research can be conducted in parallel with the implementation of conservation actions. Some research is currently being conducted on the use of vulture parts for traditional use purposes; this should be expanded to include additional parts of the species' range.	Conduct an awareness and education campaign amongst the users of vulture parts, e.g. traditional healers and prophets, focusing on the increasingly vulnerable status of the resource, and on the likely outcome of unsustainable harvesting.
15	Disturbance at roosts and breeding sites	Disturbance (on the ground or from air traffic), especially at breeding sites, is a known source of mortality, especially at certain sites. The overall prevalence and trend of this factor is unknown, but the problem may be increasing, e.g. in South Africa at sites in KwaZulu-Natal, in the Magaliesberg (Gauteng/North-west) and at Potberg Mountain (Western Cape). Remote sites are less affected.	Not considered a research priority.	Conduct an awareness and education campaign. Involve the Civil Aviation Authority in this action - request a buffer zone around key colonies. Land-use planning should take into account roosting/breeding sites. Provide provincial authorities with map localities of sites (for SEA and EIA evaluations).

A No.	B Mortality factor	C Current scenario	D Research requirements	E Proposed conservation actions
16	Lack of awareness/conservation ethic.	There is a general lack of awareness of the importance and plight of threatened species (and ecosystems), accompanied by a pervading lack of a conservation ethic. South Africans need to become more aware of their country's spectacular biodiversity and should become more involved in its protection. One important effect is the lack of capacity in government conservation agencies to plan and implement conservation programmes, including those aimed at conserving threatened species.	Not considered a research priority; sufficient general and specific information exists to address the issue.	Contribute to the creation of an awareness of the need to protect our threatened species, and the fragile ecosystems that they occupy. Further involve land custodians in conservation activities. Promote improved awareness by land management organisations (such as farmers' associations), education of future landowners (as part of the land redistribution programmes of countries that have them). Liaise with appropriate national government agencies to urge action and to seek ways to contribute information and assistance.

Monitoring and Evaluation (M&E) was not originally included in the matrix as a "mortality factor". However, during the prioritization process (see later), it was agreed to include it (i.e. the lack of a proper M&E programme) as one of the factors contributing to the species' decline. With hindsight, we have decided to remove it from the list of factors, the justification for this action being that although an M&E programme is essential for tracking the success, or otherwise, of conservation actions, it itself cannot directly help to reverse the species' decline.

Vultures that forage or breed on commercial farms or on communal land are particularly vulnerable to one or more of the 16 factors listed in Table 2. Consequently, promoting the utilisation of large protected areas (e.g. national parks) by the vultures for part of their foraging activities, leading to the possible re-colonisation of disused breeding sites on this land or in its vicinity, will result in local amelioration of the combined impacts of all these factors. This conservation action can be attempted through protected area-based programmes to provide a sustained supply of uncontaminated carrion, and safe water sources.

The marking of live vultures, and the age determination of dead ones, will be helpful in estimating the impact of a number of the mortality factors listed in Table 2, and indeed of the impact of the proposed priority conservation actions, on the population. It is recommended that a marking programme be conducted at as many of the key colonies as possible, if and when the necessary resources (human, financial, equipment) become available. However, given the urgent need for on-the-ground conservation action, a marking programme should not, at this stage, enjoy a higher priority than the research and conservation actions recommended in Table 2.

8. Monitoring and evaluation

Currently, colony monitoring is taking place in a random and non-strategic manner, and there seems to be no clear monitoring goal. Also, there is no clarity as to who will house and curate the monitoring database, and as to who will carry out the ongoing scientific analysis, interpretation and reporting of the data. This needs to be addressed.

It was agreed that a strategic, systematic, flexible, practical and affordable monitoring and evaluation (M&E) programme, to track demographic changes in relation to conservation actions and to detect the emergence of new threats, must be designed and implemented. Without this, it will be very difficult, if not impossible, to assess the impact of the conservation plan, and to obtain early warning of new mortality drivers. The monitoring scheme proposed for Cape Griffons by Piper (2004) should serve as the basis for the monitoring component of the Conservation Plan. This scheme recommends that the 18 colonies that hold about 80% of population must be monitored annually, and less important sites less frequently. It was, however, cautioned that the operation of an M&E programme will be largely meaningless unless actions to address the identified research and conservation priorities (see Tables 2 and 3) are implemented in the field. The allocation of resources (human, financial, technical) for the conservation plan should take this aspect into account.

9. Ranking of mortality factors

The results of the process to rank the mortality factors, according to their perceived impact on the Cape Griffon, are provided in Table 3.

Table 3: Ranking of the 16 factors that are considered to be contributing to the decline of the Cape Griffon, as determined by 16* workshop participants. Priority ranking values are qualified by numbers of votes per factor. (1 = highest priority, 16 = lowest priority)

Factor	Number of votes	Priority ranking
Decrease in the amount of carrion	54	1
Inadvertent poisoning	34	2
Electrocution on electricity transmission structures	33	3
Exposure to agro-chemicals	24	4
Loss of foraging habitat	20	5
Unsustainable harvesting for traditional uses	20	6
Lack of awareness/conservation ethic	18	7
Collision with electricity cables and tower guy wires	14	8
Disturbance at roosting and breeding sites	13	9
Direct persecution	12	10
Drowning in high-walled farm reservoirs	6	11
Shortage of bones and bone fragments in diet	3	12
Lack of roosting and breeding sites	3	13
Variation in carcass composition	1	14
Inappropriate food items (pica)	1	15
Lack of surface water	0	16
TOTAL	**256**	

*the number of participants present when the ranking exercise was conducted

From Table 3 it is apparent that:

- addressing the decrease in the amount of carrion was overwhelmingly regarded as the highest priority for conservation action;
- addressing the issues of inadvertent poisoning (via problem animal control activities) and electrocution on electricity structures formed the next clear group, in terms of priority conservation action;
- addressing exposure to agrochemicals, loss of foraging habitat and unsustainable harvesting of vultures for traditional uses formed a third group, also in terms of priority conservation action.

The research requirements, for each of the high-ranking mortality factors mentioned above, are included in Table 2.

10. The basis of a Conservation Plan

Given that approximately 80% of the Cape Griffon population is associated with some 18 breeding sites (Piper 2004; Figure 1), it was agreed that maximum benefit would be achieved if conservation action were to focus on these 18 sites (to be called the “core” colonies), and their associated foraging domains. To achieve this, a Cape Griffon Task Force (CGTF) will be established.

10.1 The Cape Griffon Task Force (CGTF)

The overall goal of the CGTF is the stabilization of the core colonies. More specifically, the CGTF will:

- drive the implementation of the Cape Griffon conservation plan, principally by planning and overseeing the micro-management of each of the core colonies and their respective foraging areas, and will
- exercise accountability for the effectiveness of the implementation of the conservation plan; this will be measured by the temporal trend in the status of each of the core colonies.

Furthermore, the CGTF will:

- comprise a group of "colony champions", ideally one for each of the core colonies,
- meet soon to compile a protocol for how it will operate,
- recruit "champions" for core colonies,
- develop a common approach/protocol for the compilation of colony-specific management plans, closely guided by the contents of Tables 2 and 3 in this report,
- meet at least once a year to report on progress, and to plan for the following 12 months,
- produce an annual Cape Griffon status report, and will
- organize a single total count at all breeding sites in 2008.

The Birds of Prey Working Group will render assistance to the CGTF by:

- providing a co-ordinating role,
- providing interim administrative support, and
- investigating the funding and appointment of a full-time or part-time CVTF co-ordinator.

10.2 Action at the colony level

Each colony "champion" will recruit a group of volunteers, ideally comprising people from all walks of life and bearing a wide range of skills and experience. They should include private, government and NGO stakeholders. This team will take responsibility for the compilation and implementation of the management plan for the colony in question. Where necessary, specialist inputs can be contracted in.

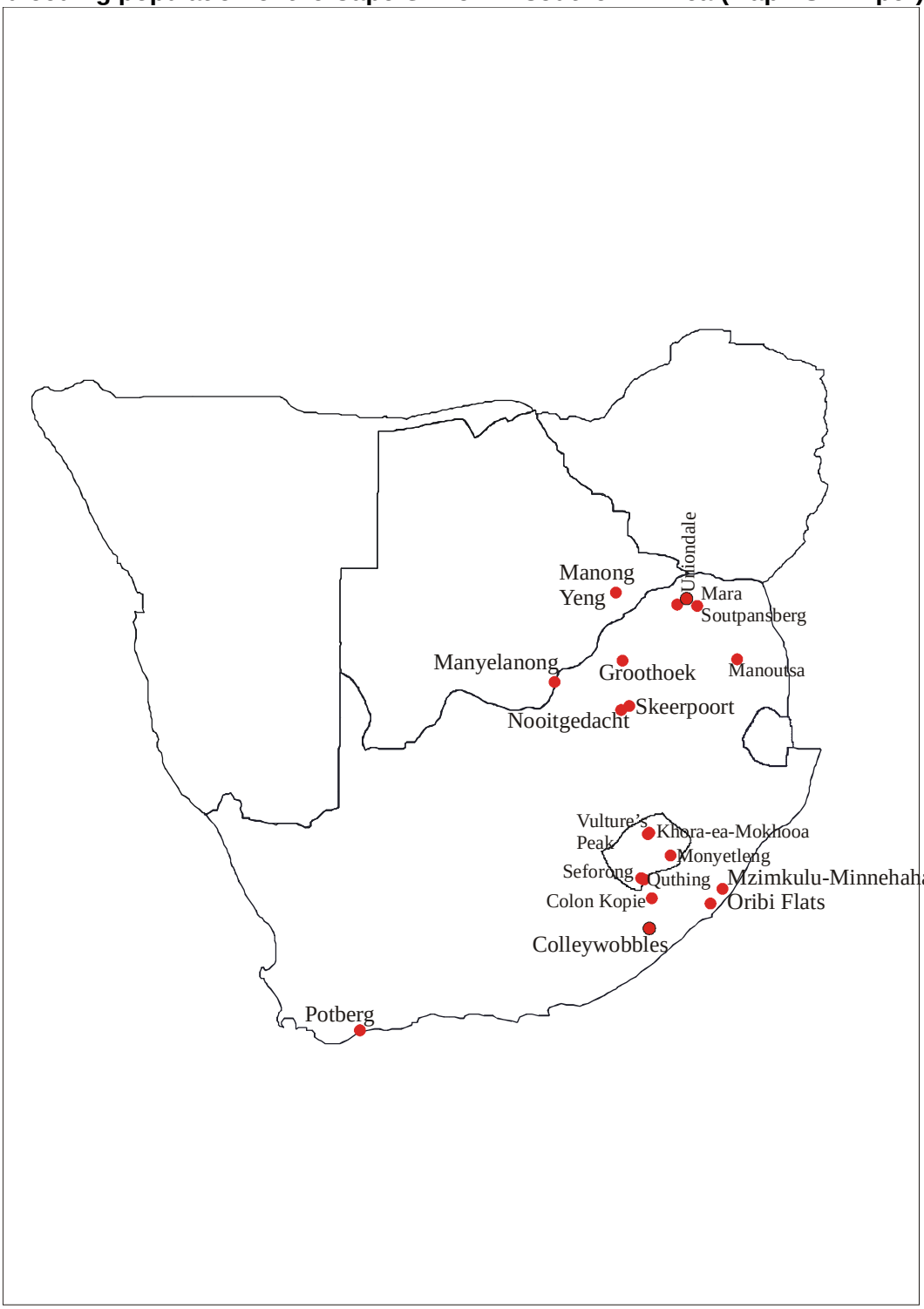
The management plan for each colony should take into account the rankings in Table 3. In particular, the factors ranked 1-5 must be addressed. At colonies where one or more low ranked factors are important, the management plan must take this into account, but **not** to the exclusion of the high ranked factors.

The proposed research and conservation actions described in Table 2 serve as a guideline for the compilation of the detail of the management plan for each core colony.

11. Impact of the conservation plan on other species

Whilst the conservation plan discussed here focuses on the Cape Griffon, it is emphasized that many of the factors that have a negative impact on its population also have a similar impact on other animals, e.g. avian and mammalian scavengers, and predators, and associated taxa. It therefore follows that certain conservation actions proposed for the Cape Griffon will benefit animals other than vultures. In addition, some of the conservation actions proposed for vultures will have benefits for the ecosystems in which they occur.

Figure 1: The location of the 18 colonies that hold approximately 80% of the breeding population of the Cape Griffon in southern Africa (Map: S E Piper).



12. Conclusion

There was strong consensus amongst the workshop participants that the conservation status of the Cape Griffon was a matter of increasing concern and that concerted and co-ordinated action is now required if the species was to stand a chance of surviving the combined onslaught of the many pressures that are impacting on it. In this regard, it is encouraging that there are people, and institutions, that are prepared to contribute to, and indeed drive, new conservation initiatives for the species.

There was also consensus that, whilst marking and monitoring actions were important components of a research and conservation plan, they will serve little purpose if on-the-ground conservation actions are not implemented, as a priority, to address the key mortality factors. As such, the planning, co-ordination, funding and implementation of these actions **must** receive priority attention in the implementation phase of the conservation plan.

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