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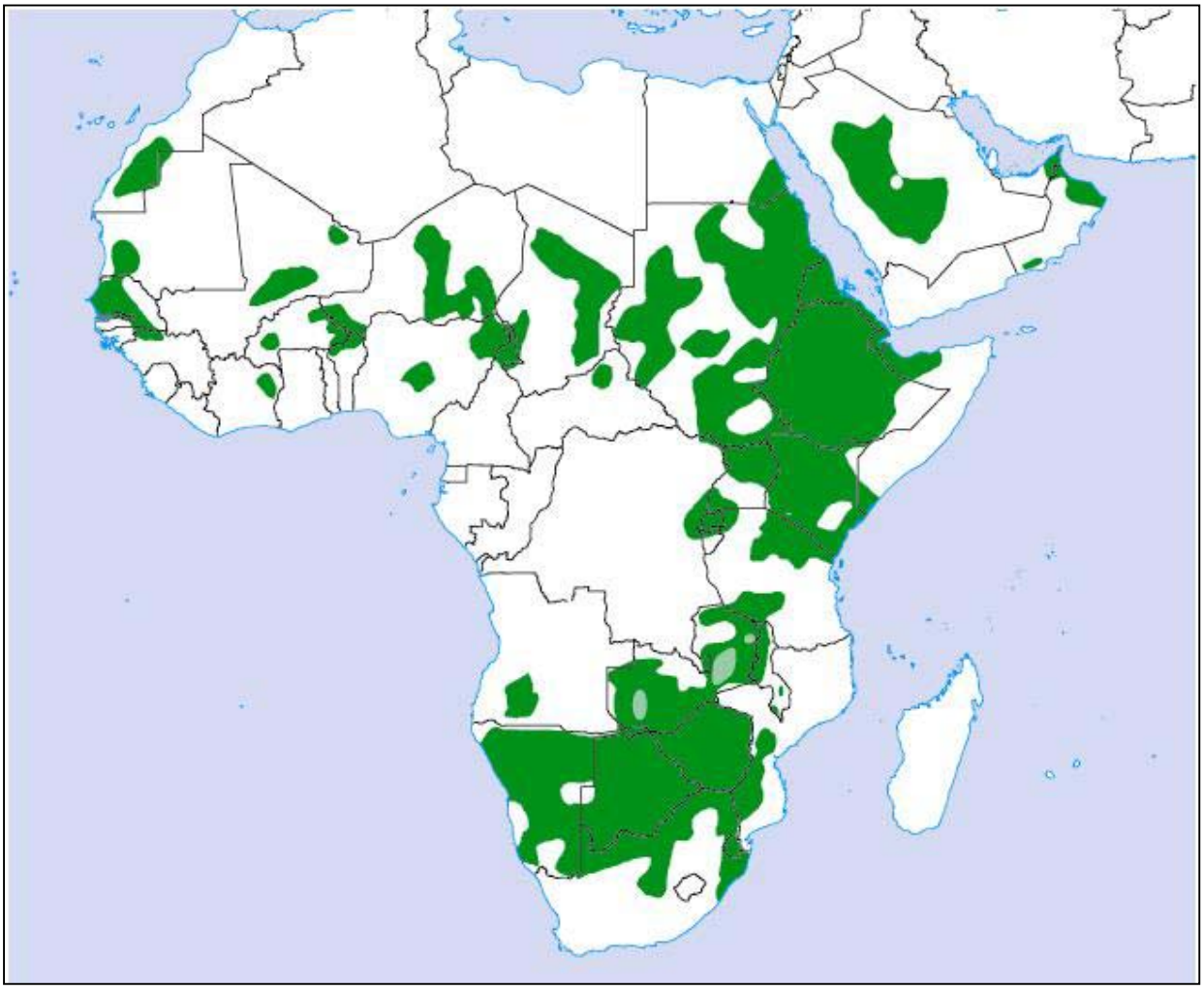

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International Species Action Plan for the Lappet-faced Vulture, *Torgos tracheliotus*

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Contents

Preface

The relationship between BirdLife International and IUCN-The World Conservation Union stretches back into the formative years of both organizations. BirdLife International is IUCN's main partner and advisor on issues related to bird conservation and has played a leading role in the Consortium formed to develop the IUCN Red List of Threatened Species (www.iucnredlist.org) into a global tool for biodiversity conservation.

A particularly close relationship exists between BirdLife International and IUCN's Species Survival Commission (SSC). Each being extensive networks of species conservation expertise, the two organisations have worked together to produce several coordinated global assessments of the world's birds since the 1980s.

As an active member of the Red List Consortium, BirdLife International has taken a leading role in the development of the Red List criteria and standards, and has pioneered the development of Red List indicators. Using this system, BirdLife's 16 years of Red List data is allowing us to see meaningful trends in the status of the world's birds.

In Africa, BirdLife International has already taken a lead in site-based bird conservation, culminating in its landmark publication *Important Bird Areas in Africa and Associated Islands*. The concept of Important Bird Areas (at both national and regional levels) has proved very useful and is already showing direction for other types of biodiversity conservation on the continent.

However, the conservation of key sites alone may be insufficient to protect many species. Species with dispersed ranges, with only a small proportion of their population inside protected areas, or species facing a multitude of threats, often require a more integrated approach. Conservation efforts for such species require careful planning, taking into account the views and interests of all stakeholders, so allowing conservationists and ecosystem managers to mobilise their resources in an effective and strategic way.

This action plan is one in a series produced by BirdLife International for threatened birds in Africa. I urge all readers and users of this publication to push the conservation of Africa's birds, cornerstones and indicators of the continent's natural wealth, to a new level. Awareness of the need to conserve species and their habitats is slowly growing amongst policy makers. What we often lack are the tools and guidance to implement the appropriate measures. This series provides that critical service. In raising the profile of the problems facing Africa's avian species and the measures needed to secure their future, I believe, these plans will have a long-lasting impact on the conservation, not only of birds, but of the continent's rich biodiversity.

Achim Steiner
Director General
IUCN – The World Conservation Union

Foreword

Birds are part of the global ecosystem and studying them tells us about the natural environment on which we all depend and its biodiversity. Humankind values birds for educational, economic, recreational, cultural, ethical and spiritual reasons. Because birds are important, 105 organisations worldwide are working together through the BirdLife International Partnership to conserve the world's birds and their habitats.

The Africa BirdLife International Partnership, currently represented in 18 African countries, has so far documented 1,230 Important Bird Areas (IBAs), sites that are internationally important for the conservation of birds and biodiversity in Africa. Unfortunately, 43% of these have no legal protection, leaving a fifth of the continent's globally threatened bird species at greater risk of extinction.

Africa has a total of 341 globally threatened bird species. Some of these are residents of more than one country, others are migratory or widely dispersed. The conservation of cross-border, migratory or widely dispersed species requires concerted strategic species-based approaches such as Species Action Plans, to complement long-term site-based strategies such as National Parks and other protected area systems. Species Action Plans are scientifically authoritative documents that, with wide consultation and agreement with the major stakeholders, provide the relevant agencies with specific and time-bound actions for conserving priority species. Species Action Plans therefore provide a framework for action at local, national and international levels, in addition to being used as fundraising and advocacy tools.

With funding from the UK Department for Environment, Food and Rural Affaires under the Darwin Initiative for the Survival of Species and with financial and technical support from the Royal Society for the Protection of Birds (RSPB, the BirdLife International Partner in the UK), the Africa BirdLife International Partnership has developed a format and process of species action planning involving the participation of representatives from governments, species experts and interest groups, conservation NGOs and local communities. This Species Action Plan is one of seven international and 15 national plans for priority bird species in Africa which were produced as a pilot to test the new approach. It is hoped that the format and process used in the production of these plans will act as a model for the production of other plans for the conservation of priority threatened fauna and flora in different countries of Africa and beyond.

The production of action plans is just the beginning of the process, because it is important to translate the plans into action. The involvement and agreement of national government representatives in the production of these plans will help stimulate the inclusion of the plans into existing and proposed national conservation strategies. In addition, members interested in the conservation of individual species will evaluate the successes and failures of the implementation process.

It is hoped that all those interested in the wise use of Africa's natural resources and the conservation of her breathtaking bird diversity will make effective use of these plans.

Achilles Byaruhanga
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This Action Plan is an output of a three-year project – 'Action Plans for the conservation of globally threatened birds in Africa' which is part of the Species Conservation Programme of the African Partnership of BirdLife International. Major support for the project came from the UK Department for the Environment, Food and Rural Affairs (Defra) under the Darwin Initiative and the Royal Society for the Protection of Birds (the RSPB) (the BirdLife Partner in the UK). Special thanks are due to these two organisations.

The project was co-ordinated on behalf of the BirdLife Africa Species Working Group (a technical arm of the BirdLife International Africa Partnership) by ***Nature***Uganda, BirdLife South Africa and the RSPB (BirdLife in Uganda, South Africa and UK respectively). A Steering Committee comprising members of the above organisations and the BirdLife Africa Partnership Secretariat supervised project implementation. The project was supported and implemented by 17 African BirdLife Partner Organisations. Their efforts were unrelenting and BirdLife International thanks them all sincerely.

A network of dedicated people in Africa interested in the conservation of Lappet-faced Vulture, led at national level by National Species Action Plan Co-ordinator for Ethiopia, played a pivotal role in developing this Action Plan by pooling and sharing information and organising an International Stakeholder Species Action Plan workshop. This workshop was attended by stakeholder representatives from seven range states of the species (Burundi, Djibouti, Egypt, Ethiopia, Namibia, South Africa and Uganda). These stakeholders included representatives of conservation NGOs and government departments. Warm thanks are due to all those involved in these organisations. A Lappet-faced Vulture Group that will oversee and coordinate the implementation of this plan was formed and will work hand in hand with the existing Vulture Study Group.

Many other individuals contributed information, advice and support. BirdLife International thanks them all. May their efforts for species conservation continue to flourish and bear fruit.

Acronyms and definitions:

ASWG: African Species Working Group. ASWG is a technical arm of the BirdLife International Africa Partnership. Its role is to promote single species conservation initiatives within the BirdLife African Partnership through continuous development and implementation of an African Bird Species Conservation Programme.

CAP: BirdLife Council for the African Partnership (see back cover)

CBD: Convention on Biological Diversity

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora`

DRC: Democratic Republic of Congo

EBA: Endemic Bird Area. EBAs are defined as places where two or more species of restricted range i.e. with world distributions of under 50,000 km2 occur together (Stattersfield et al, 1998)

EIA: Environmental Impact Assessment

EN: Endangered species

IBAs: Important Bird Areas. IBAs are sites of global biodiversity significance identified using international, objective standard scientific criteria. Places may be considered IBAs if they hold globally threatened species; restricted range species (world range <50,000 km2); biome-restricted species and/or congregations of significant numbers of the global population of a bird species. An IBA should as far as possible, be different in character from the surrounding area; exist as an actual or potential protected area; and, alone or with other sites, provide all the requirements of the birds, when present, for which it is important. (Fishpool and Evans, 2001).

ISAPC: International Species Action Plan Coordinator

LC: Least Concern species

NSAPC: National Species Action Plan Coordinator

NGO: Non-governmental organisation

NBSAPs: National Biodiversity Strategies and action plans

NIBACS: National Important Bird Area Conservation Strategies

NT: Near-threatened species

The RSPB: Royal Society for the Protection of Birds

SAP: Species Action Plan. 'A Species Action Plan (SAP) is a scientifically authoritative, strategic document that defines specific, measurable objectives and actions for conserving priority species. The plan should be achievable, time-bound and involve all appropriate stakeholders' (BirdLife International Africa Partnership, 2001).

SIG: Species Interest Group. A Species Interest Group/Species Working Group is a group of people interested in the conservation of a species. It usually includes experts who have a lot of knowledge of the species and are interested in promoting its conservation but could also include a variety of other stakeholders such as local communities, hunters, business people, etc. (BirdLife International Africa Partnership, 2001).

SSG: Site Support Group. Local people based in or around sites who are concerned about biodiversity loss and who draw on the experience and achievements of the wider BirdLife International Partnership to create local solutions for biodiversity conservation and improved livelihoods.

VU: Globally Vulnerable

Executive summary

This Action Plan provides a framework within which the conservation status of globally Vulnerable Lappet-faced Vulture *Torgos tracheliotus* may be improved. It sets out conservation strategies aimed at stabilising and/or increasing the Lappet-faced Vulture populations across their range. The major outputs are: the distribution, population size and trends of the species determined and the impact of human activities at key sites minimised. The population and status in many range countries is poorly known, and further information is both sought and welcomed.

Representatives of stakeholder groups, that included governmental and non-governmental organisations from the species' range states, developed the plan. The various stakeholders were assigned roles and responsibilities in the implementation of the 5-year plan. There are various opportunities and on-going projects that will enhance the implementation of the plan within the range states. However, there are also risks that may hamper implementation, and should therefore be borne in mind.

Under the umbrella of the African Species Working Group, a group of conservationists met and then worked to compile this action plan. This group with assistance from the African Species Working Group Coordinator, will work to coordinate the implementation of this plan, hand-in-hand with the existing Vulture Study Group.

The process of developing this plan was participatory and interactive, to provide an on-the-job training opportunity for African Conservationists to develop their skills in species conservation approaches. The skills and experience gained will enable them to train others so that the process can continue to build the capacity in Africa. Ultimately, many conservationists will be able to produce Species Action Plans at national or international levels for their priority species. The involvement of government representatives will, in addition to stimulating the production of the relevant priority national plans, facilitate the process of incorporating the new species conservation approaches into overall national biodiversity conservation frameworks and strategies.

1 Introduction

1.1 Why a Lappet-faced Vulture Action Plan?

The Lappet-faced Vulture is an Afrotropical and marginally Palearctic species classified as vulnerable because only a small, declining population remains, owing to poisoning and persecution (BirdLife International 2000). There are possibly 1,000 pairs (almost 3,000 individuals) in southern Africa, at least the same in east and north-east Africa, and possibly only 500 pairs in west Africa and the Sahara, giving a total rough estimate of the African population of at least 8,000 individuals. Thus an International Action Plan for the species, as recommended by BirdLife International 2000, was necessary.

In addition, because of the limited capacity in species action planning in Africa, Lappet-faced Vulture (found in 41 countries, 33 African) action planning provided an opportunity for stakeholders in many African countries to contribute directly or indirectly to the planning process, and gain skills in species conservation.

The action plan that has developed, with participation and input from governments, creates an opportunity to initiate a combined regional effort to address the conservation needs of this species and to build capacity in species conservation across the range states.

1.2 Methodology

This International Species Action Plan was developed at an international stakeholder workshop using a process and format developed by the BirdLife International Africa Partnership (BirdLife International 2001). The workshop process involves four main steps.

1. Presentation and discussion of background information about the species in question in order to identify gaps in knowledge on the species and capture new information.
2. A thorough analysis of the threats in a cause-effect relationship using the problem analysis.
3. Use of the agreed threats, their interrelationship and differing priorities to draft mitigating interventions.
4. Development and agreement on a monitoring and evaluation plan to assess whether there is change as a result of the interventions.

Further details about this methodology can be obtained from a Training Manual developed during the project (Sande *et al*, 2005).

2 Background information about the lappet-faced vulture

2.1 Introduction

The Lappet-faced Vulture is a globally vulnerable species according to the IUCN/BirdLife threat criteria (C1). It is believed that the species has experienced a more than 25% decline in its population within a period of 10 years or three generations. The proportion of adults in the total population of the species is considered to be less than 10,000 and it is experiencing a continuous decline (BirdLife International 2000).

It is an Afrotropical and marginally Palearctic species and though widespread and not uncommon over considerable areas, it has withdrawn from many parts of its former range. In others, notably in Sahel and Southern Africa, the species continues to decrease. It is rare in the areas of its former

western and northern range. The Lappet-faced Vulture is now restricted to Africa and the Arabia Peninsula, where it is found in 41 countries.

2.2 Taxonomy

Class: Aves
Order: Falconiformes
Family: Accipitridae
Genus: *Torgos*
Species: *tracheliotus*
Races: *A.t. tracheliotus* (Africa), *A. t. negevensis* (Arabia and Israel)

Some authorities believe the species should correctly be known as *Torgos tracheliotos*. In view of the origin as described by Levaillant as *tracheliotos* (Gr) = gristly ears, in reference to head and neck wattles, this is likely to be correct. In this plan we retain the currently used name *tracheliotus*, while noting that its revision is probably required.

2.3 Geographical variation

The species is often treated as monotypic, though sometimes *nubicus*, the north-east African population, is treated as a separate race for having a browner plumage, partly brownish thighs, pale head and less developed lappets (Ferguson-Lees & Christie 2001, Brown *et al*. 1982, Mundy *et al*. 1992). However, relatively recent studies have shown that the Arabian populations are more distinct indicating that it is best to treat the species as two races, with *nubicus* representing a somewhat intermediate stage in a cline of decreasing colour and contrast from south to northeast (Ferguson-Lees and Christie 2001). The African race, *A. t. tracheliotus*, is very black, with white thighs and patagial line, bald red head, large lappets and yellow (in south) or black bill. *A. t. negevensis,* the race from the north-eastern extreme of the species range, is altogether browner, including partly brown thighs and brown patagial line, downy greyish and pink head, blackish bill which makes it comparable to immature stage in sub-Saharan Africa (Ferguson-Lees & Christie 2001, Mundy *et al*. 1992). The difference between the two subspecies appears to be more distinct in flight making their identification from below easier (Mundy *et al.* 1992). The southern and eastern *tracheliotus* has a strikingly black and white appearance while *negevensis* is uniformly blackish brown with only some individuals showing white markings on the underwing. However, birds from Israel including those that dispersed from Saudi Arabia, have quite large amount of pure white feathers on the back (Hatzofe pers. com.).

2.4 Distribution and Population Status

While the largest part of the species' range is within the Afro-tropical biogeographic zone, the Lappet-faced Vulture also occupies a relatively smaller expanse at the south-western edge of the Palearctic region. Although it is still widely distributed and not very rare, its range has shrunk substantially and a continuous declining trend is evident notably in the Sahel and southern Africa. It is also uncommon in the western and northern edges of its range (Ferguson-Lees and Christie 2001).

The species range in Africa encompasses countries along southern Sahara in to the Sahel, down through east Africa, across the northern two-thirds of southern Africa, but not in the former or existing forest areas of West and Central Africa. It either breeds or is resident in Senegal, Mali, Burkina Faso, Niger, Chad, Sudan, Ethiopia, Somalia, Kenya, Tanzania, Uganda, Rwanda, easternmost DR Congo, Zambia, Malawi, Mozambique, Swaziland, northeast and western South

Africa, Zimbabwe, Botswana and Namibia. The species does also occur in the Gambia, northern parts of Guinea, Cote d'Ivoire, Benin and Central African Republic, as well as southern Angola.

Records show that the species range started to shrink in the 19th century in South Africa, where its distribution was wider than it is today (Mundy *et al*. 1992). In that country, the species started to retreat from the south and it has not been reported from the Transkei since 1916. In the southern and eastern Eastern Cape Province, the last time it was seen was in 1966. Currently, there are breeding populations of the species in the Northern Cape (particularly the Kgalakgadi Transfrontier Conservation Area), the eastern 'Transvaal' lowland (almost the entire Kruger National Park), northern KwaZulu-Natal and eastern Swaziland. In the rest of southern Africa, it is widespread.

Except in Somalia, where the species is reported only from the northern and southern ends of the country, it enjoys a widespread distribution in the rest of the East African range states (Mundy *et al*. 1992). In the DRC, it is probably restricted to the plains of the Virunga National Park on the eastern border of the country. The vulture is considered common and widespread in Sudan and breeds almost throughout the country. In West Africa low-density occurrences are apparent in countries like Mauritania, Senegal and Mali.

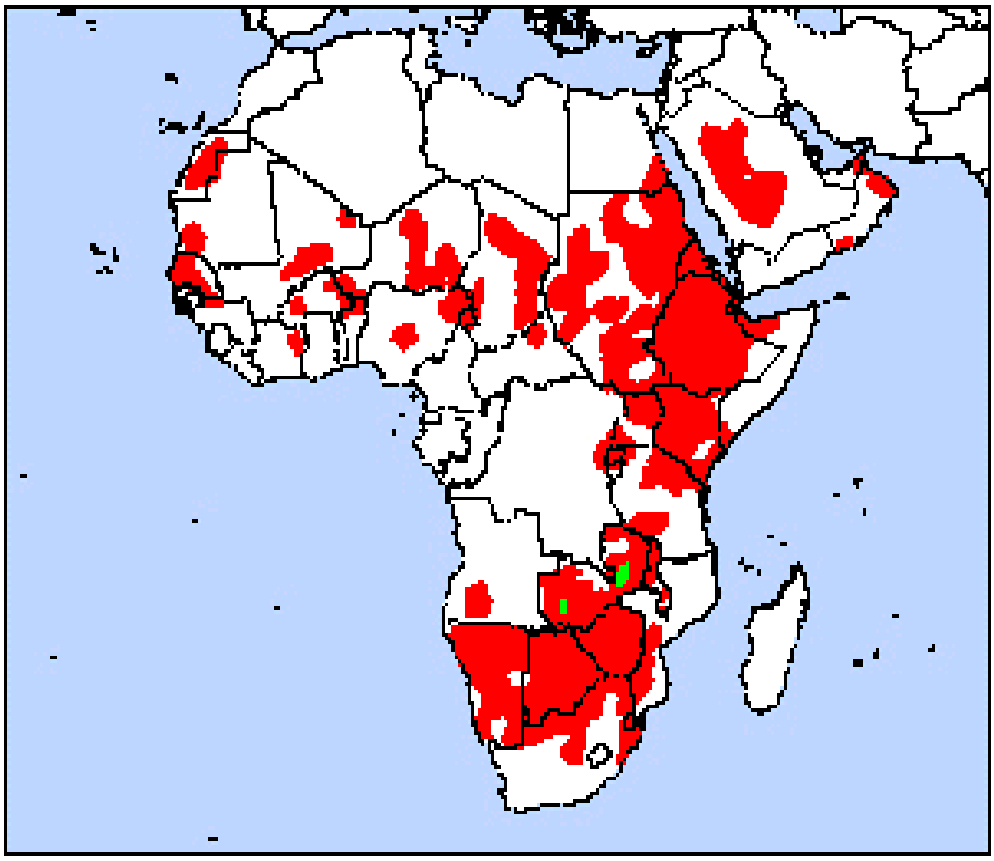
The species is now considered likely to be extinct in Western Sahara because it has not been reported there since 1955. The Atlas Mountains are also removed from the geographic range of the species, since in countries like Algeria it might have lasted only until the 1930s and from Morocco there are no more reports of it after the 1972 sighting of two birds. Southern Tunisia, from where it had disappeared no later than 1930, and Israel, where only three birds were remaining until 1994, have now joined the list of former range countries. Currently very small populations are enduring in south-eastern Egypt and Mauritania. The Nigerian population has been experiencing a major decline since the 1970s and it is now suspected that the whole population in that country may have been extirpated. Probably, it used to breed in Jordan and there is no evidence suggesting that it still continues to breed in Israel (Ferguson-Lees & Christie 2001, BirdLife International 2000, Mundy *et al*. 1992). In Arabia, it was increasing in 1990s in interior Saudi, Yemen, Oman and United Arab Emirates (Ferguson-Lees & Christie 2001, BirdLife International 2000, Mundy *et al*. 1992).

According to some estimates, the species has a total population of about 8000 birds in Africa, that are scattered within an area of over 8 million square kilometres. This number is projected from estimates of regional totals, that suggest the presence of about 1000 pairs (about 3000 individuals) in southern Africa (south of Okavango-Zambezi), 1000 pairs and 1000 immature birds in eastern Africa and about 3000 birds in west Africa and the Sahara. Adding to this, only about 500 birds that occur in the interiors of Saudi Arabia and other small numbers elsewhere in Arabia gives the global total population of the species (Ferguson-Lees and Christie 2001, BirdLife International 2000). Figure 1 shows the global distribution of the species. Table 1 shows the population status and trends through the core of the species range. Annex 1 shows the population status with trends and the local distribution, numbers and protected area status of species' sites within seven range states.

Table 1: Population, distribution and seasonal occurrence of Lappet-faced Vulture
(Quality code according to the World Bird Database;A = reliable, B = incomplete; C = poor; U = unkown)

Country	Population*	Distribution	Population trend*	Seasonal occurrence	Notes/Reference
South Africa, Swaziland	150–200 pairs Maximum of 500 individuals (B)	Mainly confined to Conservation Areas of Kruger, Kgalakgadi and KwaZulu – Natal and Kalahari (Northern Cape)	Stable, increasing in some areas (Northern Cape) (B)	Resident	Barnes (2000)
Botswana	U	Widespread	Stable (B)	Resident	Boshoff et al (1997)
Kenya	U	Absent or rare in high rainfall, forest areas and coastal strip. Widespread in open game country, especially Masai Mara (SE), recent sightings in Laikipia game reserves (North) – (C)	Declining (C)	Resident (C)	
Tanzania	U. Probably .2000 birds	Widespread in Northern Game Parks, also in Ruaha, Selous, Saadani, Moyowosi. Rare or absent elsewhere	U	Resident	
Mozambique	U, low numbers	Very localized	Declining (C)	Resident and visitors from Kruger NP and Swaziland	Boshoff et al (1997)
Zimbabwe	300 pairs (B?)	SE, SW, NW & along central highlands	Stable (B)	Resident	Boshoff et al (1997)
Ethiopia	400-500 pairs (C?)	Widespread (most lowlands)	Stable (U)		
Burundi	U	U	U	U	
Egypt	10-20 pairs (B)	South-eastern Egypt Elba PA, Aswan (U.E)	Stable (B)	Resident (breeding)	Irregular surveys
Djibouti	U	Localized IBA no DJ007 & South west of Djibouti border Ethiopia	U	U	Welch and Welch 1992, Djibouti III- migrant raptor count + 1987
Namibia	500 pairs	All over densest in Namibia Namib-Naukluft and Etosha NP & Waterberg plateau park	Suspected 10% decline in last 3 generation	Resident	Simmons and Brown (In prep. Red data book)

Figure 1. A map showing the range states of the Lappet-faced Vulture



Source: BirdLife International 2000

2.5 Movements

The species is usually sedentary but adults are nomadic at times. There are some records of dispersal in Chad and West Africa during the rainy season that lasts between June and September (Ferguson-Lees and Christie 2001, Mundy *et al* 1992). The species traverses considerable distances while foraging, as studies on Israeli populations have shown that birds feed in areas located more than 150 km north of their breeding area. The recovery of colour-ringed birds in the Namibia desert at distances of 120-700 km and also over 800 km from northeast South Africa to Zambia indicate that immature birds are also dispersive (Oatley *et al* 1998). Vagrants were also recorded in the last 50 years in countries like Morocco, southern Libya, Jordan, northern Israel (after their extinction from Israel, thus the birds could have most likely come from Saudi Arabia) and Spain.

2.6 Conservation Status

The Lappet-faced Vulture is vulnerable to extinction according to the IUCN/BirdLife threat criteria (C1). It is believed that the species has experienced a more than 25% decline in its population within a period of 10 years or three generations (BirdLife International 2000). The numbers of adults in the total population of the species is considered to be less than 10,000, and it is experiencing a continuous decline.

There is much concern over the population of the race *negevensis* in Israel which was reduced to only one pair in 1989 (Mundy *et al*. 1992). Initiatives that were taken to breed the subspecies in captivity have produced three birds in the Tel Aviv University research zoo between 1994-1996. The African population experienced a drastic decline in Upper Egypt, where not more than 10 pairs are thought to

survive. It has already gone extinct in Mediterranean countries of North Africa. Fortunately, expeditions have confirmed the presence of many birds in the Arabian Peninsula and breeding birds are known from Tayama, at 450 km south-east of Israel's Negev. However, concerns are already being shown about the latter population, owing to the increased motorized transport in the desert which in turn increases disturbance. There is also a risk of increased use of pesticides on irrigated crops.

In South Africa the species is locally red listed as vulnerable and in Namibia, where over 100 vultures (mainly Lappet-faced Vultures) were killed in one poisoning incident in 1995 (Simmons 1995) by strychnine, the estimated proportion of the species that was considered to be severely at risk was 50% or more. The national legislations and signatories to international conservation treaties that may benefit the Lappet-faced Vulture in seven range states are shown in Table 2.

Table 2: National legislation and signatories to international conservation treaties relevant to Lappet-faced Vulture in some range states

Country	National legislation	CITES	CBD	CMS	UNESCO Man and Biosphere	African Convention	World Heritage Convention
Burundi	Legislation on PAs (1980) Environment code. NBSAP	✔	✔	In preparation	✔		
Ethiopia	Not yet for birds.	✔	✔		✔	✔	✔
South Africa	Biodiversity Bill. PA bill-NEMA Provincial proclamations	✔	✔	✔	✔	✔	✔
Djibouti	Law for potential site for protected area in process Biodiversity protection law in process	✔	✔	In process	-	✔	-
Namibia	Special protection under draft Parks Bill	✔	✔	-			
Egypt	Law 53/66-4/94-102/83	✔	✔	✔	-	✔	✔
Uganda	Uganda Wildlife Statute 1995-Protected species Act	✔	✔	✔	✔	✔	✔
Angola			✔		✔		
Benin		✔	✔	✔	✔	✔	✔
Botswana		✔	✔			✔	✔
Burkina Faso		✔	✔	✔	✔		
Cameroon		✔	✔	✔	✔	✔	✔
Central African Republic		✔	✔		✔	✔	✔
Chad		✔	✔	✔	✔	✔	

Democratic Republic of Congo		✔	✔	✔	✔	✔	✔
Cote D'Ivoire		✔	✔	✔	✔	✔	✔
Eritrea		✔	Accession only	✔			
Gambia		✔	✔	✔	✔	✔	✔
Guinea		✔	✔	✔	✔	✔	✔
Kenya		✔	✔	✔	✔	✔	✔
Malawi		✔	✔		✔	✔	✔
Mali		✔	✔	✔	✔	✔	✔
Mauritania		✔	✔	✔		✔	✔
Mozambique		✔	✔			✔	✔
Niger		✔	✔	✔	✔	✔	✔
Nigeria		✔	✔	✔	✔	✔	✔
Rwanda		✔	✔	✔	✔	✔	
Senegal		✔	✔	✔	✔	✔	✔
Somalia		✔		✔		✔	✔
Sudan		✔	✔			✔	✔
Tanzania		✔	✔	✔	✔	✔	✔
Zambia		✔	✔		✔	✔	✔
Zimbabwe		✔	✔		✔		✔

2.7 Relationship with other SAPs and biodiversity strategies

National Biodiversity Strategies and Action Plans and National IBA Conservation Strategies are relevant to this SAP.

2.8 Ecology

2.8.1 General habits

Although many consider the species to be solitary under normal conditions, some authorities claim that it spends only the first three months of the breeding cycle unaccompanied by its partner and it is more common to see adult birds in pairs than singly for the remaining part of the year (Mundy *et al*. 1992). The number of birds usually seen at carcasses does not exceed ten, although at some exceptional places like the sub-desert areas of Namibia, Somalia, and Northern Chad where the species is relatively common, it is possible to see up to 50 individuals at large food sources or water holes (Ferguson-Lees and Christie 2001, Brown *et al*. 1982, Mundy *et al*. 1992). In Israel, 22 and 30 individuals in 1964 and 1969 respectively were observed on camel carcasses (Meretsky and Lavee, 1991). The flight by pair-members in unison is attributed more to territoriality than courtship, which is almost unknown in the species. At carcasses it is much more powerful and aggressive than White-headed Vultures *A. occupitalis* (Brown *et al*. 1982). It habitually roosts on trees in open plains and birds of a pair often stay close to each other on the same or adjacent trees, sometimes for many successive nights. It is unable to fly far without thermal currents in a flat country and in mountainous country like Ethiopia it can easily ride updraughts to attain great heights.

It arrives at carcasses usually later than other vultures, but at times it is the first to break in to a carcass using heavy sideways blows with its powerful bill. A bird does not start to feed immediately on arrival at a carcass preferring to stand around for much of the time before suddenly plunging itself in to the swarm of other vulture species that it scatters fiercely (Mundy *et al.* 1992). Although it can dominate all other species, it can readily be robbed by, for instance, jackals. Unless it is very hungry, the Lappet-faced Vulture seldom joins a struggling throng of foraging griffons and when it does, it easily forces its way in to get access to the food. When it is feeding alone its powerful head and bill enables it to eat tough sinews, dry skin and small bones not utilized by griffons.

Analysis of pellet remains collected from nests have shown that most of the food that was brought to the nestling came from small animals. This suggests that predation might also be a foraging strategy adopted by the species (Mundy *et al*. 1992). The identified remains belonged to monitor lizards, birds, hares, Pangolin, Steenbok, Grey Duiker, goats, rodents (including porcupines), jackals, polecats, African civet and mongoose in southern Africa; and hare, jackal, and bird remains were found in Serengeti. Although authorities believe that the Lappet-faced Vulture is equipped with very strong feet to grip a small prey, and a very heavy bill to tear it apart, there is not a satisfactory eyewitness account of the species killing any animal of whatever size (Mundy *et al*. 1992). The pellets, which are nearly as large as a man's fist, comprise matted dry hair and sometimes have hooves entwined in them. Some of the remains that have been collected from the birds' nests have been quite huge, and indicate the capacity of the species to swallow large pieces at one go. Mundy *et al*. (1992) found a Duiker sized leg, but the record is the 'complete front leg of a Thompson's Gazelle' in a Serengeti nest. Since there has never been any record of the species carrying items in its feet, it was presumed that the bird either swallowed these legs or carried them in its bill. Authorities are not convinced that the bird's crop is capable of carrying more than a kilogram at a time, in spite of a reported 3 kg being found in one bird's stomach. However, a bird that was "too heavy to fly" was captured in the Kalahari Gemsbok National Park and regurgitated a mass of meat and Springbok skin that weighed 1.45 kg. Such a proportion of a smallish crop on a large bird, that limits the amount of food to be carried, suggests that the bird requires to eat almost daily which makes predation a more suitable

strategy than either piracy or scavenging. However, observations at carcasses had recorded an adult stuffing its crop full in just 27 minutes, and three immatures almost filled theirs in less than 20 minutes. In another instance, six birds fed vigorously for an average of 45 minutes and none had a crop that was swollen. Generally, the bird requires an average of between 400 g and 500 g food per day, or about 6.5% of the adults' average body weight.

2.8.2 Habitat requirement

The species typically inhabits dry savannah, thorn bushes, arid plains, desert habitats with scattered trees in wadis and open mountain slopes with varying altitude ranging from sea level up to 4,500 m (Ferguson-Lees & Christie 2001, BirdLife International 2000, Brown *et al*. 1982). Although it is rarely seen foraging either in dense woodlands or disturbed (e.g. roadsides) habitats, the species prefers undisturbed open country with some trees, where there is little or no grass (Ferguson-Lees & Christie 2001, BirdLife International 2000, Brown *et al*. 1982).

Trees are the most important components of the species' habitat, because they are needed for roosting and nesting. Birds almost exclusively roost on trees, and even those that linger at a waterhole until late in the afternoon never spend the night on the ground (Mundy *et al*. 1992). Nests are also built on top of high trees with special preference for thorny species of *Acacia, Balanites* and *Terminalia*. Other tree types like broad-leaved figs and cedar are sometimes used (Brown *et al*. 1982).

2.8.3 Breeding habits

The Lappet-faced Vulture builds solitary nests that are normally dispersed in individual territories sprinkled at greater distances (Brown *et al*. 1982). For instance, in Serengeti, nests are on average 4.2 km apart and studies from Zimbabwe showed that the mean distance between nests was 3.2 km. This suggests that a pair's minimum home range is 8 km^2 and this can expand up to 15 km^2 in other habitats. Although a total range of 43 km^2 was recorded in Serengeti, the species probably confines its foraging activities within the limits of its home range, not traversing long distances like griffons. In countries like Chad, where the species is abundant, nests are built very close to each other, as was the case of one reported instance, in which a nest was assembled on a single tree together with an active nest belonging to the White-backed Vulture *Gyps africanus* (Brown *et al*. 1982).

The Lappet-faced Vulture builds huge flat nests that are completely open to the sun placing them mostly on top of *Acacia* trees at any height from 3 to 15 m (Ferguson-Lees and Christie 2001, Brown *et al*. 1982). If measured at the rim, the dimension between two diametric outermost points of a nest is 120-220 cm and this can reach up to 300 cm in some instances. The vertical thickness of a nest is 30-100 cm, but it gets thinner at the centre where there is a shallow bottom depression with a crosswise breadth of 100 cm. A bird builds its nest from sticks, lining the inside part with dry grass before carpeting it with hair and skin from regurgitated pellets (Ferguson-Lees & Christie 2001, Brown *et al*. 1982).

Pairs often build only one nest, but it is also normal to have 1-3 nests that are used alternately. A nest is used year after year, often for many years, unless the foundation on which it was built is unstable, in which case it could collapse and then be deserted. In some cases branches growing around a nest may make it inaccessible for pairs, instigating desertion. The birds repair an old nest by placing new sticks round the rim and relining it with fresh grass in courtship periods. One or both birds usually roost in or beside a nest, sometimes for as long as the whole year and such a habit is practised more regularly with the approach of the laying date.

- Probably attributable to the immense variability in position, landscape and climate across the species' huge geographic range, the different sub-populations start and finish their breeding

activities at different times of the year. Birds in East Africa breed throughout the year, while May-January is the season of procreation for those occurring in Southern Africa. Those that are found in the extreme north of the species range, start to breed in November finishing it in July to September (Ferguson-Lees and Christie 2001). The following is a list of breeding dates for a number of range states:

- Southern Tunisia, Northern Sahara: March
- Senegal: January–February
- Mali: December
- Chad: November–February
- Ethiopia and Somalia: October–late February
- Northern Uganda, Western Kenya: May, June, September–November
- Eastern Kenya, Northern Tanzania: May, July, August–October
- Serengeti, Tanzania, Southern Kenya: January–June
- Zimbabwe: May–June, Namibia: May–August
- Israel, December (January-egg laying)

The normal clutch is one egg, (although rarely at times birds lay two eggs) and spend 54–56 days incubating it (Brown 1986, Bridgeford et al 1995, Ferguson-Lees and Christie 2001, BirdLife International 2000, Mundy *et al*. 1992). In Israel, four successful breeding attempts with a clutch size of one egg hatched in 57 days. Amongst four two-egg clutches that were measured for egg size, the eggs found in two of them had very similar sizes, suggesting that both have been laid by the same female (Mundy *et al*. 1992). The egg is a broad oval object with a dull white background that is spotted and blotched brown (Brown *et al*. 1982). Measurements from 85 eggs in Africa yielded an average of 92.6 x 70.6 mm, with a range that was 82.8–104 x 65.7–78.6 (Mundy *et al*. 1992). The estimated fresh weight of eight eggs from Zimbabwe was 266 g (range 235–318 g), which is about 4% of the female's body weight. Before laying, the females spend some time in an incubation posture. Although both sexes participate in the incubation process, the proportion of time that each of them spend for this purpose is not yet determined due to the difficulty of distinguishing the sexes using natural morphologic features. An incubating adult rarely receives a relief from the 'tedious' task of sitting very tightly on its egg possibly to protect it either from the sun or predators, and at such times the bird does not disrupt such an exertion unless disturbed by an intruder determined to reach its nest (Brown *et al*. 1982). After incubation, the egg hatches, the chick taking 125-135 days to fledge successfully at the rate of around.0.4 young per pair per year (Brown *et al*. 1982, BirdLife International 2000). A bird may incubate an addled egg for a period of 100 days or more and if it has lost an egg at an early stage of incubation, it lays a replacement egg in another nest (Brown *et al*. 1982). A complete nesting cycle, that starts with the laying of an egg, and culminates with the first flight of a fledged chick, therefore takes *c*. 185 days. During the first 20 days of brooding, parental care is at its peak, and it declines with the progress of the chick towards adulthood. According to some authorities, parents continue to shelter their young for as long as 12 months or more (Ferguson-Lees and Christie 2001) and there are some others who shorten this period by about six months (Brown *et al*. 1982). Instead of starting to breed in the immediacy of their independence form their parents, young birds wait until they reach at least six years of age (BirdLife International (2000). Nest failures are attributed to collapse of nests, stealing of eggs by humans and predation of young in nests built on low trees (Brown *et al*. 1982). Remarkably though, there is a record of a pair of Lappet-faced Vultures hatching and rearing a White-headed Vulture in the wild (Mundy *et al* 1992).

Studies that monitored breeding success in four African national parks had come up with remarkably similar breeding success rates that were between 40% and 50% (Mundy *et al*. 1992). It was thought that a total of 123 young birds were successfully reared from, 277 pair-years at a 44% success rate. Because it is highly probable that these studies had not included all the birds resident in the areas,

40 % success rate (0.4 young per pair per year) was considered as a realistic average figure. Although some authorities claim that the long breeding cycle does not permit pairs to breed every year, Mundy *et al.* (1992) are of the opinion that a pair would try and breed annually, provided that other factors, such as food and climate, remained at their optimum.

2.9 Threats

Nest destruction, reduced food availability, electrocution and inadvertent poisoning were identified as the major threats to the Lappet-faced Vulture. All the threats and issues, and their causes in the cause-effect relationship that ultimately lead to the low population of the Lappet-faced Vulture are shown in the Problem Tree (Annex 2).

2.10 Stakeholders' analysis

The main stakeholders that were identified were government ministries and departments, conservation NGOs, farmers and land owners and local communities. The detailed analysis on how the different stakeholders impact on the species is shown in Annex 3.

3 Action programme

This includes the vision, aim, immediate objectives, specific objectives and projects and activities of the action plan. The vision, aim, immediate objectives and specific objectives are indicated in Table 5.

After identifying the threats of the species across its range, there is need for appropriate interventions or solutions to mitigate those threats. The solutions in this action plan have been packaged as vision, aim, objectives and projects and activities.

3.1 Vision

The vision, or a long-term dream, of this Action Plan is to 'Ensure a self sustaining, healthy population of Lappet-faced Vulture across the entire range'. The Action Plan will not achieve this vision during its five-year lifetime, but will contribute towards it.

3.2 Aim

Within five years, this action plan aims to 'Have the initiative implemented to address the threats necessary to stabilise and increase Lappet-faced Vulture populations across their range'. The action plan hopes to achieve this aim during its five year lifetime.

3.3 Objectives

Stabilising and increasing the populations of the Lappet-faced Vulture within five years will be achieved through the implementation of three strategic immediate and nine specific objectives shown in Table 3. The indicators are for the vision, aim and the priority specific objectives.

Table 3: Vision, Aim and Objectives

Vision	Indicators
Self sustaining, healthy population of Lappet-faced Vulture across the entire range	Lappet-faced Vulture no longer a vulnerable species
Aim (5 years)	
Initiative implemented to address the threats necessary to stabilise and increase LFV populations across their range.	Population of Lappet-faced Vulture across 50% of range states known by 2006 Initiatives to stabilise the population in place by 2007.
Immediate objectives	
1 Improve geographic knowledge of Lappet-faced Vulture (◆◆◆◆)	
2 Reduce un-naturally high Adult and juvenile mortality of LFV (◆◆◆)	
3 Increase productivity of LFV (◆◆◆◆)	Up-to-date distribution map available by 2009
Specific objectives	
1.1 Improve knowledge on the occurrence, distribution and population dynamics of LFV (◆◆◆◆)	Up-to-date distribution map available by 2009 Population of LFV in all the stronghold range states* known by 2006* provisionally Namibia, Zimbabwe, Botswana, Tanzania, Kenya, Ethiopia.
2.1 Reduce nest disturbance by humans (◆◆◆)	
3.1 Reduce Lappet-faced Vulture electrocutions and collisions (◆◆◆). Biggest recorded cause of mortality in South Africa (49 individuals between 1996 and 2003)	Increase in number of modified power lines that are vulture friendly. Reduction in number of electrocutions in IBAs that contain a high density of Lappet-faced Vulture. Elimination of vulture unfriendly designs for new lines. Bird Impact Assessment Studies for new power lines as part of EIA processes. Production of best practices manuals for electrical utilities. Provision of training to utility staff in the elimination of bird mortality on power lines.
3.3 Reduce Lappet-faced Vulture drowning (◆◆)	
3.3 Reduce Lappet-faced Vulture poisoning (◆◆◆◆)	Extent of Lapped-faced Vulture poisoning known by 2006. Programmes to mitigate poisoning initiated by 2007. Poisoning reduced by 40% in all range states where it is a problem*, *,provisionally Namibia/South Africa.
3.5 Reduce intentional killing of Lappet-faced Vulture (◆◆)	
3.5 Reduce food shortage for Lappet-faced Vulture (◆◆◆)	

(◆◆◆◆: critical, ◆◆◆: high, ◆◆: medium, ◆: low)

3.4 Projects

Projects are what needs to be done to achieve the different objectives. They are numbered according to the corresponding specific objectives which are also numbered according to the corresponding immediate objective.

1.1 Improve knowledge on the occurrence, distribution and population dynamics of the Lappet-faced Vulture (◆◆◆◆)

1.1.1 Initiate atlasing of all raptor and vulture populations, differentiating between sightings, breeding and giving numbers of birds
1.1.2 Assess population size, trend and produce a good ageing scheme
1.1.3 Assess breeding success and mortality factors using ringing methods
1.1.4 Assess habitat and food requirements of Lappet-faced Vulture
1.1.5 Training in raptor conservation in general, and Lappet-faced Vulture in particular
1.1.6 Capacity building among incipient, current and future researchers to do better research and monitoring
1.1.7 Improve networking, coordination and fundraising for vulture conservation in Africa.

2.1.1 Reduce nest predation (◆◆◆)

2.1.2 Identify important nesting areas
2.1.3 Increase awareness among the community
2.1.4 Assist the formulation and implementation of appropriate legislation e.g Environmental Impact Assessment process
2.1.5 Continuously monitor success of awareness, i.e. no trees remaining
2.1.6 Seek alternatives where conflict occurs between local community- and resource-use needs of Lappet-faced Vulture

2.2 Reduce nest disturbance (◆◆◆)

2.2.1 Research to identify whether nest disturbance is a cause of low productivity
2.2.2 Awareness campaign to reduce nest disturbance directed at eco-tourism, local communities and developers
2.2.3 Lobby for establishment of PAs for Lappet-faced Vulture core areas (i.e areas with viable populations of Lappet-faced Vulture)

3.1 Reduce Lappet-faced Vulture electrocutions & collisions (◆◆◆)

3.1.1 Make utilities and conservation NGO's in Africa aware about hazardous pylon designs and suitable mitigation measures by offering training courses to staff on the impact and prevention of bird mortality (including Lappet-faced Vulture) on electrical infrastructure
3.1.2 Produce information material on reasons, frequency distribution of Lappet-faced Vulture electrocutions and collisions with power lines (e.g. posters).
3.1.3 Produce best practice manuals for utilities on the prevention of bird mortality on electrical infrastructure
3.1.4 Initiate Bird Impact Assessment Studies, utilising LOCAL knowledge and expertise as an integral part of EIA's for new power lines within the distribution range of the Lappet-faced Vulture

3.2 Reduce Lappet-faced Vulture drowning (◆◆)

3.2.1 Make farmers aware about suitable reservoir and drinking trough modification methods and implication of drowning for vulture conservation and reservoir water quality

3.3 Reduce Lappet-faced Vulture Poisoning (◆◆◆◆)

3.3.1 Promote awareness about selective predator control techniques and improved livestock management methods.

3.3.2 Collect information about legislation policy related to the use of poisons and pesticides and where appropriate enact legislation against the incorrect sue of poison and pesticides

3.3.3 Get information about the relative impact of poisons on Lappet-faced Vulture populations across the species' range

3.3.4 Assess the extent of use and the possible impact of NSAIDs on vultures in Africa

3.3.5 To gather baseline information about the potential lead impact on vultures in Africa

3.4 Reduce the killing of Lappet-faced Vulture (◆◆)

3.4.1 Through awareness, change the negative perception about the feeding habits of the Lappet-faced Vulture and other scavenging birds.

3.4.2 Gather information about the extent of use of vultures for traditional medicine purposes (reasons, alternatives, selective sources)

3.4.3 Get information about the proportion of domestic livestock killed in the diet of Lappet-faced Vulture throughout its range, disseminate this information to all stakeholders

3.4.4 Enact legislation to protect against deliberate killing of Lappet-faced Vulture and other vultures except in specific and exceptional circumstances (e.g. under permits)

3.5 Reduce food shortages for Lappet-faced Vulture (◆◆◆)

3.5.1 Provide information of support to relevant authorities of organisations on land use impacts in relation to the distribution of Lappet-faced Vultures

3.5.2 Ensure that the appropriate Environmental Impact Assessment process is followed for all developments, and that the possible impact on Lappet-faced Vultures and other scavenging birds is addressed

3.5.3 Encourage vulture feeding sites and encourage farmers to leave livestock carcasses that die of natural causes in the field

3.5.4 If food availability is identified as the main cause of low parental attendance leading to low reproductive success, establish vulture restaurants and vulture feeding sites, and encourage farmers to leave carcases in the field

Table 4 shows the details of how the specific projects will be implemented i.e., its priority as far as the conservation of the species is concerned; agencies that will take a lead to implement the project; time scale, cost risks and opportunities that one has to bear in mind.

Table 4: The project categories, priorities, lead agencies, time scale, cost estimate, indicators, risks and opportunities for projects required to implement the Lappet-faced Vulture

	Project	Overall Priority	Agencies responsible	Time scale	Cost	Indicators	Opportunities	Risks
2.2.5	Lobby governments and stakeholders to establish settlement schemes, forestry plantations, etc.	◆◆	National NGOs and governments.	2004–2006	$			Governments may not cooperate
2.1.3	Assist the implementation of appropriate legislation, e.g EIA process	◆◆◆◆	National NGO and responsible government depts	On going	$$	EIAs conducted before licensing development projects in all stronghold range states		Lack of governments ' interest and cooperation
2.1.5	Seek alternatives where conflict occurs between local communities and Lappet-faced Vultures (especially with respect to resource use)	◆◆	NGO	On going	$			
3.3.2	Collect information about legislation policy related to the use of poisons and pesticides and where appropriate enact legislation against the incorrect use of poison and pesticides	◆◆◆	NVG, PWG	2004–06	$			Long time frames for development of legislation Lack of government cooperation
3.4.4	Enact legislation for protection against deliberate killing of Lappet-faced Vulture except in specific circumstance (e.g. under permits)	◆◆◆	Governments, NGOs	2006–08	$$$			Governments may not cooperate
3.5.2	Ensure that appropriate Environmental Impact Assessments are done, taking into	◆◆	Government, NGOs	2004–08	$$			Corruption Inadequate Environmental Impact

	account Lappet-faced Vultures and other scavenging birds							Assessment process
2.1.1	Identify important breeding areas	◆◆◆◆	Governments, Universities and NGOs	2004–06	$$$	Important breeding areas known in stronghold range states by 2006		
2.2.3	Establish vulture restaurants and vulture feeding sites, and encourage farmers to leave carcases in field	◆◆◆◆	NGOs and Government departments.	On going	$	At least two Vulture restaurants in place in stronghold range states by 2009		
2.2.4	Lobby for establishment of PAs for Lappet-faced Vulture core areas i.e. areas where viable (>10prs) populations of Lappet-faced Vulture occur	◆	NGOs and Government departments.	2006–08	$			
3.4.3	Get information about the proportion of domestic livestock in diet of Lappet-faced Vulture throughout its range and disseminate this information to all stakeholders	◆	NVG, Conservation NGOs	2004–08	$			Lack of farmer knowledge and cooperation
C	**C) Monitoring and research**							
1.1.1	Initiate atlasing of all raptor and vulture populations	◆◆◆	NGOs, Universities, Government	2006–08	$$			Lack of communication of results
1.1.2	Assess population size, trend and age ratios	◆◆◆	Universities and Government. Research section	2006–08	$$			
1.1.3	Assess breeding success and mortality factors using ringing programmes	◆◆◆	Universities, Government Research dept and NGO	2006–08	$$$			

1.1.4	Assess habitat and food requirements of Lappet-faced Vultures	◆◆◆	Universities and Government. research institutions	2004–08	$$$			
2.1.4	Continuously monitor success of awareness	◆◆◆◆	NGOs and Universities	2006–08	$$	Number of nest trees remaining		The project does not start in the planned time The time planned is not enough
2.2.1	Research to identify whether nest disturbance is a cause of low productivity	◆	Universities and Government. Departments.	2006–08	$$			
3.1.2	Make farmers aware about suitable reservoir and drinking trough modification methods, and the implication of drowning for vulture conservation and reservoir water quality	◆◆◆	Conservation NGOs and Governments, NVG	2004–06	$$		South Africa study conducted Mitigation measures known Resource material developed	
3.3.3	Get information about the relative impact of poisons on Lappet-faced Vulture population across the range	◆◆◆	NVG, PWG, Conservation NGOs and Governments	2004–06	$$			Information not shared PWG in place
3.3.4	Assess the extent of use of impact on vultures of NSAIDs in Africa	◆◆◆	Conservation NGOs and Government, VSG, The Peregrine Fund	2004–06	$$		Asian vulture crisis and current knowledge in S. Asia	Time
3.3.5	To gather baseline information about the potential impact of lead on vultures in Africa	◆	Conservation NGOs and Government, VSG	2004–08	$		California Condor Project	Information not shared
	D) Public awareness and Training							
1.1.5	Training in raptor conservation in general and LFV in particular	◆◆◆	NGO and Governement. Dept	2004–06	$			

1.1.6	Capacity building among incipient and current and future researchers to do better research and monitoring	◆◆◆	International NGOs and NVG	2004–ongoing	$$$			
1.1.7	Networking, co-ordinating body and fundraising	◆◆◆◆	National and international NGOs	2004–05	$	VSG Africa coordinator formalised by 2005		
2.2.2	Awareness campaign to reduce nest disturbance directed at eco-tourism, local communities and developers	◆◆	NGOs and Government. depts	2005–on going	$$			
2.1.2	Increase awareness among the community (all stakeholders) to reduce nest disturbance	◆◆◆	NGOs and Government. depts	2006–ongoing	$$$			
3.1.1	Make utilities and NGO's in Africa aware about hazardous pylon designs and suitable mitigation measures	◆◆◆	IBEC, Eskom EWT Partnership, NVG	2004–05	$$$		IBEC in place, EWT Partnership- Knowledge - Resource materials	Cost of retro-fitting - Inadequate impact studies for new powerlines Lack of will to implement mitigation measures
3.2.1	Make farmers aware about suitable reservoir and drinking trough modification methods, and implication of drowning for vulture conservation and reservoir water quality	◆◆◆	Conservation NGOs, Government, NVG	2004–07	$$$			S. African Study concluded Mitigation measures known Resource material available
3.3.1	Promote awareness about selective predator control techniques and improved livestock management methods amongst all stakeholders	◆◆◆	Conservation NGOs and government, PWG	2003–07	$$$		PWG in place - Resource materials	Need accessible, cheap, easy, effective methods

3.4.1	Awareness about negative perception on Lappet-faced Vulture feeding habits	◆◆◆	Conservation NGOs, Governemnts, VSG, NVG	2004–08	$			
3.5.1	Provide information of support to relevant authorities of organisations on land-use impacts in relations to Lappet faced Vulture	◆◆◆¨	Conservation NGOs, GovernmentVSG, NVG	2004–08	$			So many role players
	E) Community involvement							
2.1.5	Seek alternatives where conflict occurs between local community resource users and LFV	◆◆	Local Government, Community leaders and NGOs	2004–on going	$$			
3.5.3	Encourage vulture feeding sites; leave carcasses of livestock that die of natural death in the field	◆◆	Local Government, Community leaders and NGO	2004–on going	$$			

LFV=Lappet-faced Vulture, NVG=New Vulture Group, VSG=Vulture Study Group (South Africa), PWG=Poison Working Group (South Africa), LG=Local government

4 Monitoring and evaluation

What and why? A monitoring and Evaluation (M & E) plan is needed to determine whether activities are progressing according to schedule and have an impact on the conservation of the species. By obtaining information on the progress made in the implementation of the activities and using this information against the set indicators (Table 4), it is possible to assess progress of implementation of the plan towards achieving the aim and objectives that were set (Table 3). Monitoring and evaluating progress on a regular basis helps to assess the priorities or slippages and make necessary adjustments if required. The M & E report also serves as a basis for keeping everyone informed.

Who? It was agreed that the M & E plan for the Lappet-faced Vulture at international level will be coordinated by the International Lappet-faced Vulture Coordinator taking the lead across all range states. The task involves co-ordinating the monitoring and evaluation, and includes financial reporting when appropriate. National Species Coordinators will take the lead at national level and are expected to engage other important stakeholders, such as conservation NGOs, Government departments, scientific experts and local community representatives. International Conservation NGOs should be involved in the M & E process where appropriate and should be encouraged to implement some of the required projects that lie in their areas of competence.

How and how often? Annually (two to three months before the end of the year), the International Lappet-faced Vulture Coordinator will circulate a table for monitoring and evaluating implementation of the Lappet-face Vulture Action Plan (a derivative of Table 4) with 2 additional columns one for completion date and another one for remarks. National Species Coordinators will provide information on national progress and return the table to the International Co-ordinator before the end of the year. A regional M & E report will be circulated by the International Co-ordinator in the first quarter of the following year.

5 Factors influencing success of action plan implementation

There are a number of factors that may affect the implementation of the action plan. Taking into account the regional differences, the risks and opportunities in the implementation of the plan are shown in Table 5. The on-going projects in countries (Table 6) may enhance the implementation on the plan in one way or another.

Table 5: Factors that may affect the implementation of the Lappet-faced Vulture action plan

Risks	Opportunities
• Lack of stakeholder participation and coordination • Lack of funds • Financial support • Inaccessibility for staff to implement the AP in the area • Distance from decision centre to area to implement the AP • Conflict affecting conservation efforts e.g. in Kibira National Park (Burundi) • Lack or scanty information • Lack of knowledge on Lappet-faced Vulture • Lack of trans-boundary PAs in the region • Low level of awareness at all levels • Cultural traditions • Problem animals • Generation time for change in farming attitude • Local community awareness • Lack of professionals or personnel to do the job • Lack of human resources • Lack of bird experts • Too late to implement plan (habitat trashed) • Lack of will (political) to implement such plans • Species conservation low priority for governments • Law enforcement very weak • Land-use changes (nesting andprey sites) • Different priority for different departments • Political instability • Actions and initiatives not sustained • Global warming	• Government interest to do the job • Strong nature conservation • Huge publicity of the action plan • Increased attention for bird conservation on the national scale • Media • Create patriotism and national interest • Presence of funding NGOs like BirdLife International • NGOs, Governments private cooperation • Collaboration with the national institute for environment and conservation nature • Vulture Study Group and other NGOs working with governments to implement plan • Capacity (Vulture Study Group, NGOs Government) • Strong legislation • Adoption of National Biodiversity Action Plans are happening in most countries • Presence of national and international legislation • Cultural significance • Species inhabits protected areas • A good proportion of the species is found in protected areas /IBAs • Inaccessibility for human in some places so preventing disturbance of the area • Proliferation of informal conservation area • Smart action plan • Eco-tourism; birdwatching • AP acts as umbrella for many scavengers • Lever for additional money • Inter-Government co-operation

Table 6: On-going projects in selected countries that may benefit the implementation of the Lappet-faced Vulture Action Plan

Country	Region/ Province	Project title	Duration	Contact person	Activities
South Africa	Northern Cape	Kalahari Raptor Project	1991–on going	Abrie Maritz	Ringing, monitoring, awareness
	National	Vulture Study Group	1970s–on going	Hayley Komen	Awareness, Sasol vulture monitoring project
		Poison Working Group	Mid 90s–on going	Gerhard Verdoorn	Awareness, poison post-mortem analyses
		Eskom- Endangered Wildlife Trust Strategic Partnership	1997–on going	Chris van Rooyen	Powerline mortality, mitigation, awareness, monitoring
		Reservoir Drowning Mitigation	Mid 90s–on going	Mark Anderson	Data collection, awareness and mitigation
Swaziland	Lowveld	Raptor nest monitoring	2000–on going	Ara Monadjem	Monitoring, research awareness
Burundi	Bujumbura	SSG/CEG	One year	Ntahuga Laurent	Monitoring Wetland birds
Ethiopia	Oromiya	Bale Ecosystem project		Anteneh Shimelis	
	Oromiya	Borena Restricted Range Spp Project		Anteneh Shimelis	
	National	IBA project		Anteneh Shimelis	
	Oromiya & Amhara	EWCP		Stuart and Zelalem	
	Afar	Wild Ass Project		Fanuel and Lakew	
	Afar Oromiya and SNNP	Grevy's Zebra Project		Stuart and Alistair	
Namibia	Namib Desert	Lappet faced Vulture Monitoring	1990–on going)	Peter Bridgeford	Ringing, breeding success vulture restaurant
	Waterberg area (N. Central)	Cape Griffon introduction and satellite tracking and community awareness	2000–on going	Maria Diekmann (REST)	Vulture monitoring community awareness, vulture restaurant, research, reintroduction
	Windhoek	Vulture rehabilitation	1990–on going	Liz Komen N.A.R.R.E.C/PWG	Rehabilitation of injured and poisoned vultures
	NW Namibia	Search for Cape Griffon and Egyptian Vulture Population	1998–on going	Rob Simmons	Aeriel survey
Djibouti	East Africa	Waterbird count	1 year	Houssein A Rayaleh National Coordinator	Ministry of Environment and WPO
Egypt	N. Africa	Egyptian biodiversity conservation strategy		Natural Conservation Sector	

		BirdLife International for conservation of IBAs		Sherif Baha el-Din	
		PA Management strategies and establishing new ones		NCS	
		Proposed bird migration research centre (ringing)		Wed Ibrahim	

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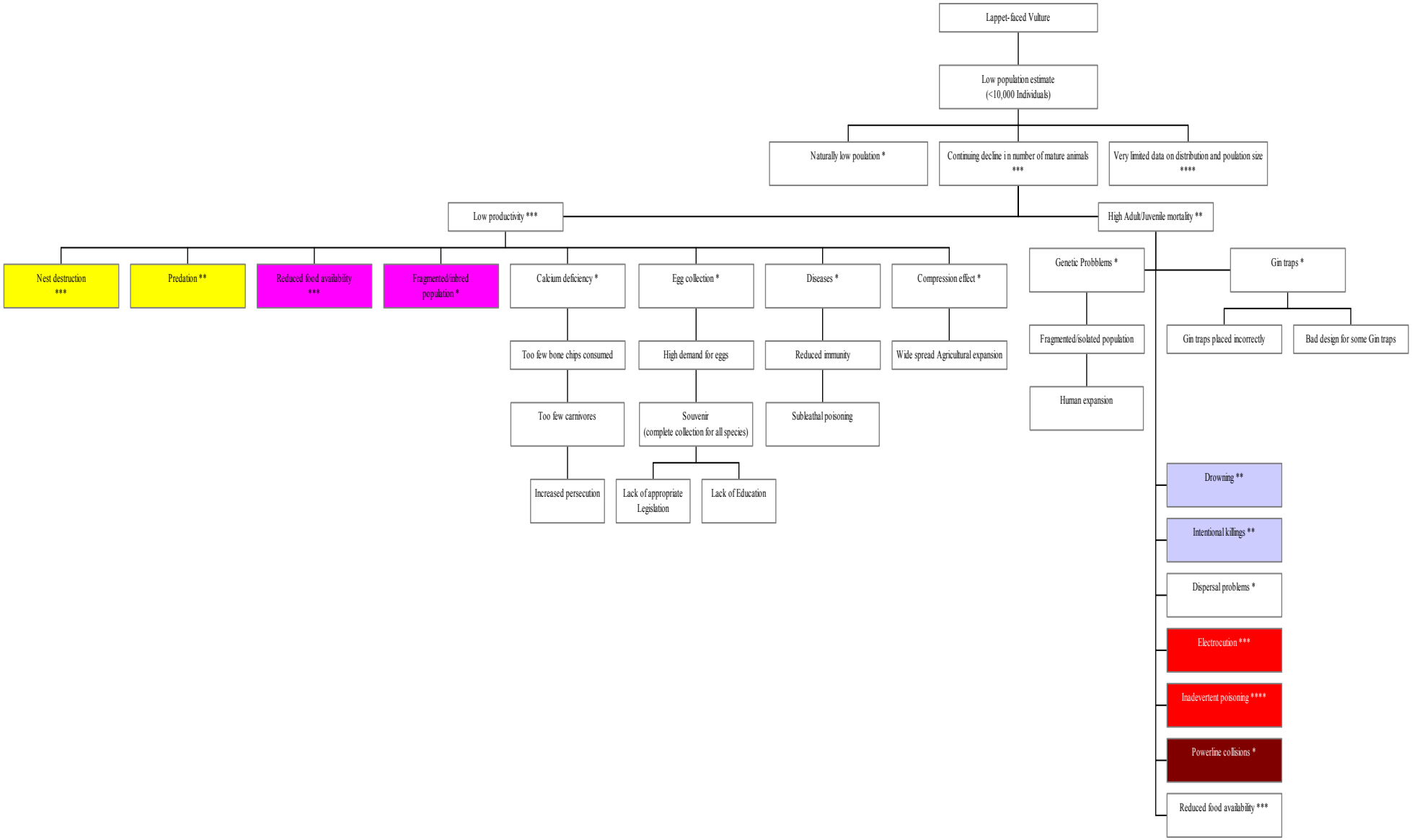
Annexes

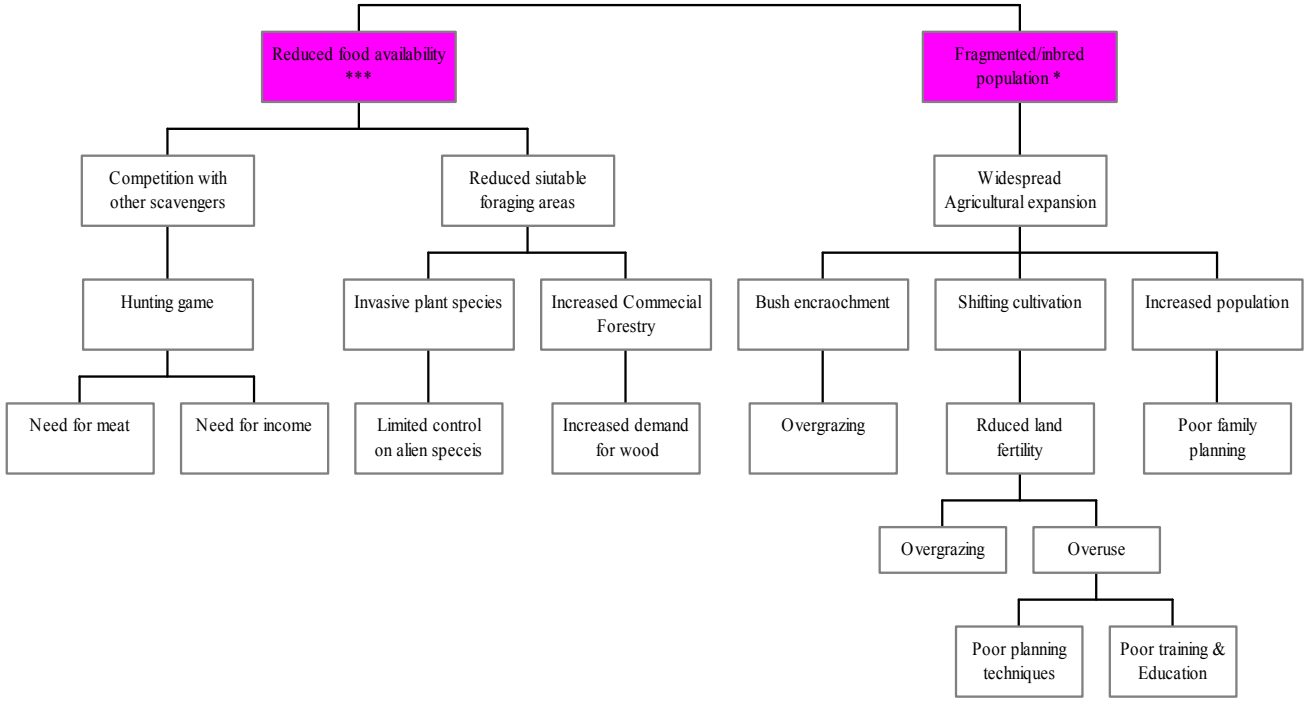
Annex 1. Local distribution, numbers and protected area status of Lappet-faced Vulture sites within seven range states: WS=Wildlife Sanctuary, NP=National Park, NR=National Reserve, GR=Game Reserve

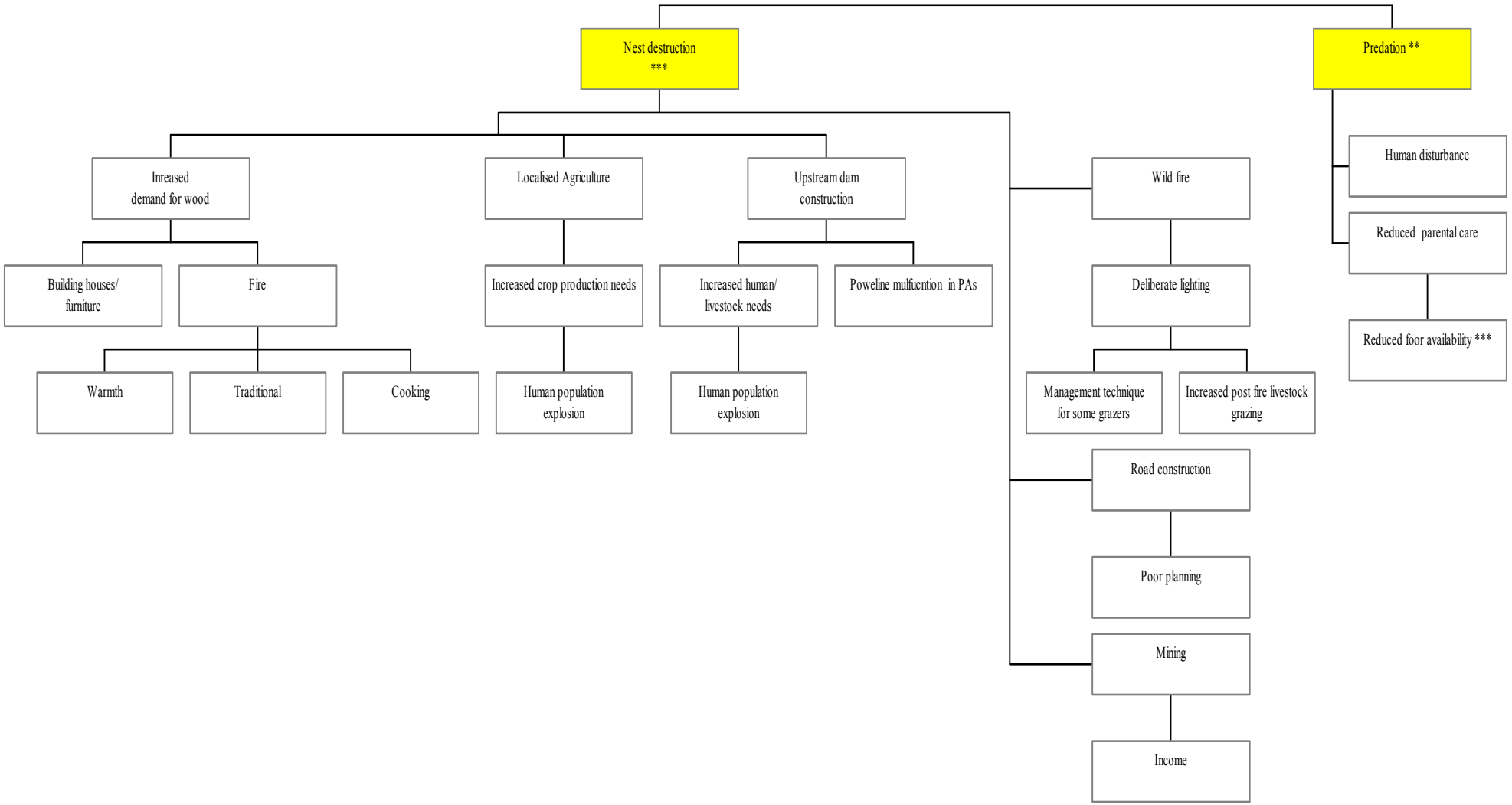
Country	Region/Province	Site IBA no./if applicable	No. of pairs	Protected Area Status	Birds occur, but don't breed	References	Notes
South Africa	Limpopo	ZA001	1	Vhemba Province NR	2	Barnes (1998)	
	Limpopo/Mpumalanga	ZA 001	40–50	Kruger NP	90–120	Barnes (1998)	
	Northern Cape	ZA 020	6–10	Kalahari-Gemsbok NP	30	Barnes (1998)	
	KwaZulu-Natal	ZA 038	2	Ndumo GR	4–8	Barnes (1998)	
	KwaZulu-Natal	ZA 041	2	Pongolo NR	4–14	Barnes (1998)	
	KwaZulu-Natal	ZA 056	2	Itala GR	5–6	Barnes (1998)	
	KwaZulu-Natal	ZA 057	3	Mkuzi GR	6–8	Barnes (1998)	
	KwaZulu–Natal	ZA 044	1	Lake St Lucia GR	2–4	Barnes (1998)	
	KwaZulu–Natal	ZA 060	16–20	Hhluhluwe/Umfolozi NP	35–50	Barnes (1998)	
	KwaZulu– Natal	ZA 062	0	Spioenkop NR	Visitors	Barnes (1998)	
	Limpopo	ZA 006	0	Waterberg	2–3	Barnes (1998)	
	Limpopo	ZA 009	0	Northern Turf Thornveld	Visitors	Barnes (1998)	
	North West	ZA 017	0	Pilanesberg NP	2–4	Barnes (1998)	
	North West	ZA 024	0	Botsalano NR	Visitor	Barnes (1998)	
	North West/ Gauteng	ZA018	0	Magaliesberg & Witwatersberg	Visitor	Barnes (1998)	
	North West	ZA 019	0	Barberspan Leeupan NR	Visitor	Barnes (1998)	
	Northern Cape	ZA 024	0	Kamfers Dam NHS	Visitor	Barnes (1998)	
	Free State & North West	ZA 029	0	Sandveld and Bloemhof Dam NR	1–2	Barnes (1998)	
Swaziland		SZ002	1–2	Hlane/Mlawula	6	Barnes (1998)	
Burundi	Bujumbura		1	Rusizi plain	2 individuals	Gaugris (1981)	Research needed
Ethiopia	Afar	Yangudi-	20	NP no gazettement		Mihret/Lakew	

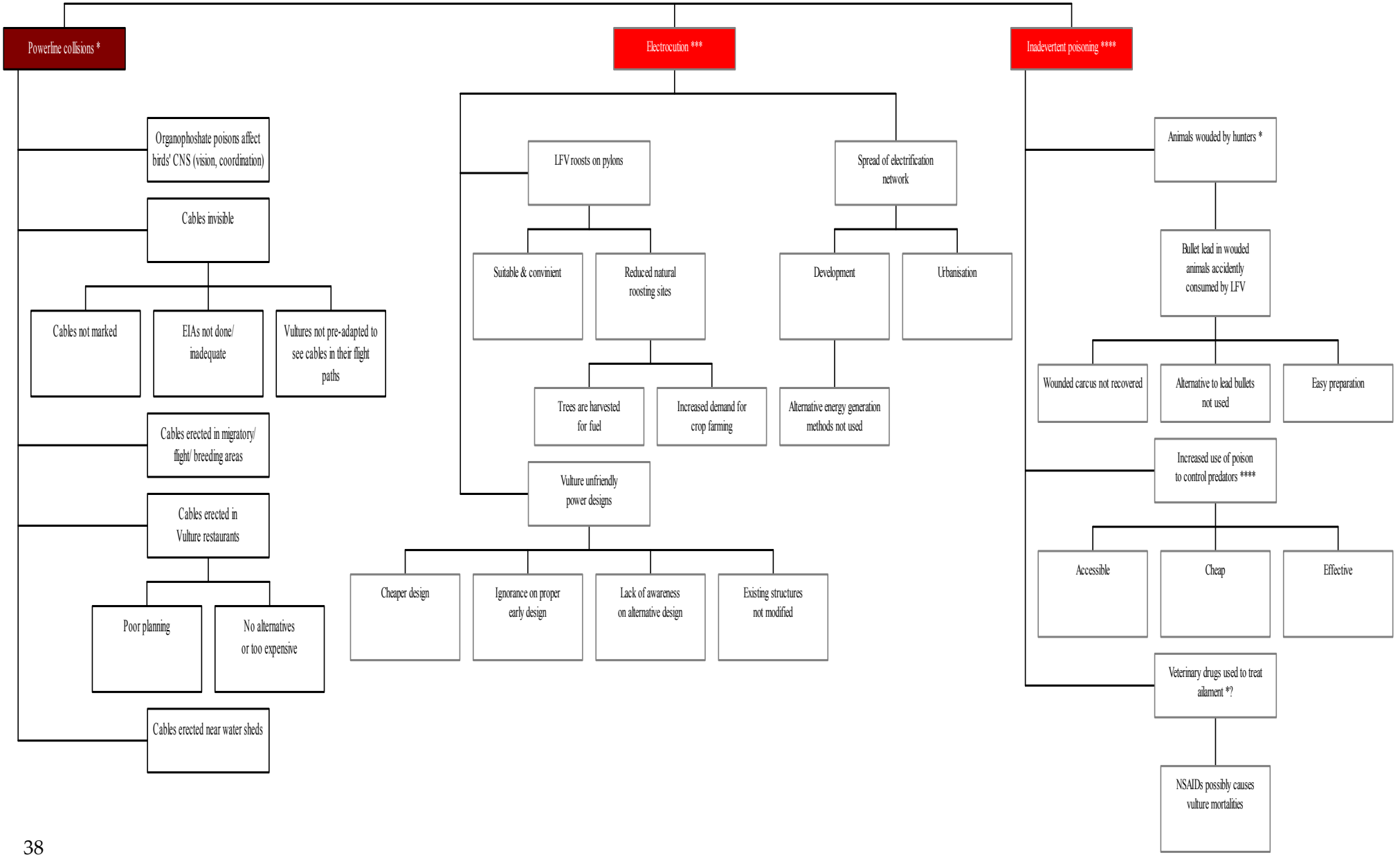
		Rassa NP (010)					
	Oromiya	Bale Mts NP (054)		NP, but not gazetted		Simon Thomsett	
	Oromiya	Abayta Shalla		NP, but not gazetted		EWNHS	
	Oromiya	Negle plain		IBA not protected		Anteneh	
	Oromiya	Yabello WS		Nominal protection		Anteneh	
	Amhara	Bahir dar		No protection		Anteneh	
	Oromiya	Asebe Teferi				Anteneh	
	Somalia	Erer					
Egypt	North Africa	3 all are (IBAs) 23,17,13		Weak	40	PA Staff	
Namibia	West	NA010 NA019	150	PA and farm land (includes NP)			
	Centre	NA006	50	Farmland	?		
	North (including Etosha & Waterberg)	NA003 NA004 NA007 NA005	300	PA and farm land (includes NP)	80		1 site= 52 individuals
Djibouti	NorthWest & South west	Potential IBA No DJ007	1	Unprotected	U	Welch and Welch 1992 Djibouti III-migrant raptor count 1987	

Annex 2: The problem tree




Reduced food availability ***
Fragmented/inbred population *
Competition with other scavengers
Reduced siutable foraging areas
Widespread Agricultural expansion
Hunting game
Invasive plant species
Increased Commecial Forestry
Bush encraochment
Shifting cultivation
Increased population
Need for meat
Need for income
Limited control on alien speceis
Increased demand for wood
Overgrazing
Rduced land fertility
Poor family planning
Overgrazing
Overuse
Poor planning techniques
Poor training & Education


Nest destruction ***
Predation **
Inreased demand for wood
Localised Agriculture
Upstream dam construction
Wild fire
Human disturbance
Reduced parental care
Building houses/ furniture
Fire
Increased crop production needs
Increased human/ livestock needs
Poweline mulfucntion in PAs
Deliberate lighting
Reduced foor availability ***
Warmth
Traditional
Cooking
Human population explosion
Human population explosion
Management technique for some grazers
Increased post fire livestock grazing
Road construction
Poor planning
Mining
Income


Powerline collisions *
Organophoshate poisons affect birds' CNS (vision, coordination)
Cables invisible
Cables not marked
EIAs not done/ inadequate
Vultures not pre-adapted to see cables in their flight paths
Cables erected in migratory/ flight/ breeding areas
Cables erected in Vulture restaurants
Poor planning
No alternatives or too expensive
Cables erected near water sheds
Electrocution ***
LFV roosts on pylons
Suitable & convinient
Reduced natural roosting sites
Trees are harvested for fuel
Increased demand for crop farming
Spread of electrification network
Development
Urbanisation
Alternative energy generation methods not used
Vulture unfriendly power designs
Cheaper design
Ignorance on proper early design
Lack of awareness on alternative design
Existing structures not modified
Inadevertent poisoning ****
Animals wouded by hunters *
Bullet lead in wouded animals accidently consumed by LFV
Wounded carcus not recovered
Alternative to lead bullets not used
Easy preparation
Increased use of poison to control predators ****
Accessible
Cheap
Effective
Veterinary drugs used to treat ailament *?
NSAIDs possibly causes vulture mortalities

Annex 3 Stakeholder analysis

Country	Stakeholder	Interest	Activities	Importance	Intensity	Proposed activities
Djibouti	Environment department	Environment protection, Biodiversity, law enforcement,	Research	+	◆	Protected areas
			Project management	+	◆	Research
			Draw environment, strategy, low project	+	◆	Public awareness
	Agriculture department.	Agriculture, fisheries	Research	+/ -	◆	Water adduction
			Water supplying	+/ -	◆◆	Fisheries development
			Law enforcement	-	◆	
	Conservation NGO	Local developments, biodiversity	Research	+	◆	Surveys on Biodiversity
			Public awareness	+	◆	Local develop
	Local and foreign military bases- French and USA	Military activities, training	Military training	-	◆◆◆	The localization of military activities
			Disturbance	-	◆◆◆	Several zones
Burundi	Wildlife Authorities and Public Administration	Conserve the species	Manage protected areas	+	◆	To perfect low application in conservation
			Keep respect for conservation legislations			To be trained and informed in species conservation
	Experts and scientists	Collection of data, research	Research activities and field work	+	◆◆	Monitor of the species and its habitat
						Train other people
	Donors and NGOs	Conservation work	Giving money and implement the action plan	+	◆◆	Continuing to secure fund
						Lobbying and advocacy for conservation of this species

	Local community and farmers	Crop and farming livestock	Destroying species habitat	-	◆◆◆	Adapt a participatory process for conservation of this species
	Medias	Increase public awareness on conservation status	Collection information and publicise it in the news (radio, newspaper, TV)	+	◆◆	Continuing publicity on this species
Ethiopia	Ethiopian Wildlife Conservation Organisation (EWCO)	Conservation	PA Management	+	◆◆◆◆	Strengthen current act (include Lappet-faced Vulture action plan in their annual plan)
	Regional Environmental Bureau	Conservation	PA & UA management	+	◆◆◆	Strengthen current act (include Lappet-faced Vulture SAP in their annual Plan)
	Ethiopian Wildlife and Natural History Society (EWNHS)	Conservation	Biodiversity research	+	◆◆◆◆	Strengthen current act (include Lappet-faced Vulture SAP in their annual Plan)
			Site conservation			
			Awareness			
	Ethiopian Wolf Conservation Programme	Conservation	Ethiopian wolf conservation and the ecosystem they are part of	+	◆	Include Lappet-faced Vulture monitoring in their activities
	National parks and reserves	Conservation	PA Management.	+	◆◆◆	Strengthen current activity and include Lappet-faced Vulture SAP
	Tour operators	Tourism	Organize wildlife safari and hunting	+/-	◆	Reduce disturbance, species protection, eco-tourism, give money to implement SAP
	Local community	Livelihood	Animal husbandry, farming, fuel collection, grass cutting etc	- /+	◆◆◆◆	Strengthen traditional NRM, make activities sustainable, back alternatives

	IBCR	Conservation	Research, preservation of genetic material.	+	◆◆	Strengthen current act and include SAP in their plans
	EPA	Conservation	Policy, research, legislation, environmental impact assessment	+	◆◆	Strengthen current act and include SAP
	AERO	Agriculture and conservation	Research	- /+	◆	Strengthen current activities consider in relation to agriculture developmentt.activities
	Media	News	Broadcasting	+ /-	◆◆◆	Strengthen positive sides
	International donors	Conservation and development	Funding and donation	+/ -	◆◆◆◆	Strengthen positive sides
	Military	War (defence)	Training and patrolling (cut lots of trees)	-	◆◆◆	Relocate (move alternative fuel)
	Mining industry	Money	Upstream poisoning	-	◆◆	Pay for cleaning up rivers
	Electric Power Authority	Electricity	Electrification	-	◆◆	Environmental Impact Assessment and take mitigating actions; stop using vulture unfriendly designs
	Farmers	Killing (problem) animals	Poisoning	-	◆◆	Seek safe alternatives
Namibia	Farmers	Habitat controllers	Land management	- /+	◆◆◆◆	Responsible use of poison
			Modification	- /+	◆◆◆◆	Appropriate land management vulture-friendly actions (restaurant, prevention of drowning) Vulture monitoring
	Government (agriculture service, vetinary Service, forestry)	Research, monitoring, legislation, poison, administrating	Population and breeding	+	◆◆◆	Continue current activities
			Assessment and conservation	+	◆◆	Continue current activities
			Permits and law enforcement	+	◆	Continue current activities

			Control	+	◆◆◆◆	Tighten control
	NGO (REST VSG, NARREC Wildlife Society.	Vulture welfare	Awareness	+	◆◆◆	Do more
			Research	+	◆◆	
			Monitoring	+	◆◆◆	
	Traditional healers	Vulture parts	Kill and disturb (not so much Lappet-faced Vulture)	-	◆	NGO provide parts and sustainable permits for healers
	Egg collectors	Collecting eggs	Breeding disruption	-	◆	STOP!
	Tour operator	Make money	Vulture restaurant	+/ -	◆	Directory of vulture restaurants by NGO impact
			Low flying	-	◆◆◆	Change air route, or prevent flights at egg lay seasons
	NamPower		Electrification	-	◆◆	Environmental Impact Assessment and take mitigating actions, stop using vulture unfriendly designs
			View and nest disturbance	-	◆◆◆	Stop and enforce penalties
South Africa	Department of Environment Affairs and Tourism	Legislation, conservation, tourism	New policy and legislation	+	◆◆◆◆	Delegation to provinces.
						Better communication with provinces
						Provision of funding to provinces.
						Development of National frameworks, e.g NESAP.
						Work more closely with NGOs

	Provincial conservation departments	Biodiversity conservation	Law enforcement	+	◆◆	Need to develop strategies for species conservation
			Awareness and environmental education	+	◆	Improved collaboration with provinces
			Research and monitoring	+	◆◆	
			Protected area network maintenance and development	+	◆◆◆	
	NGOs (Vulture Study Group/Endangered Wildlife Trust/PWG/BLSA/WESSA/WWF)	Biodiversity Conservation	Awareness	+	◆◆◆	Improved cooperation between NGOs.
		Tourism	Training	+	◆◆	Involve more non-professionals in conservation work
		General environmental issues	Research and monitoring	+	◆◆◆	
			Eco-tourism	+	◆◆	
	ESKOM	Provision of electricity	Powerlines for power distribution.	-	◆◆◆◆	All powerlines to be made raptor- friendly.
			Funding for conservation projects			Mitigation of existing bird-unfriendly structures
			Mitigation of power lines	+	◆◆	Monitoring
	AVCASA	Promote effective and safe use of pesticides	Pesticide use and production and distribution for problem animal control	-	◆◆◆◆	Awareness
						Remove harmful pesticides from use
						Enforce appropriate use of pesticides

	Private landowners	Livestock farming	Problem animal control.	-	◆◆◆	Selective problem animal control techniques (non- harmful)
			Direct persecution of vultures.	-	◆	Awareness in order to stop this
			Depletion of vulture food supply (veld mismanagement)	-	◆	Holistic resource management.
			Disturbance at nest sites	-	◆	Reservoir mitigation measures.
			Farm reservoirs	-	◆	Environmental Impact Assessments
			Removal of trees	-	◆◆	Alternative wood supply
	Traditional healers	Health of the nation	Use various methods to acquire vulture body parts	-	◆◆	Alternatives
						Obtain vultures that die of natural and other causes
						Quotas for sustainable off take
	SASOL and other corporate funders	Variety	Provision of financial support to projects	+	◆◆◆	More money for more projects
		Varied	Publicity and sell more of their products.			
Egypt	Nature conservation sector	Conservation, legislations, awareness	Habitat protection and species in PAs	+	◆◆◆	Training and monitoring support with facilities
						Cooperation with livestock sector
	Ministry of Agriculture	Conservation	Land reclamation	-	◆◆◆◆	Environmental Impact assessment forth proposed project
						Central pesticide use

	Ministry of Interior and Ministry of Defence	Law enforcement	Limited support	-	◆◆	Training
			Hunting			Involvement
	Ministry of Tourism	Eco-tourism	Safari and sport hunting	-	◆◆◆	Awareness programme
			Birdwatching	+	◆◆◆	Co-ordination with natural conservation sector
	Universities	Participation in species conservation	Research	+	◆◆◆	Intensive researches
			Technical support			Protected area staff training
	Local communities	Involvement in Implementation of action planning	Hunting, tree cutting, disturbance	-	◆◆◆◆	Increase public awareness
						Find incentives alternative
						Law enforcement
	NGOs and private sectors	Participation in conservation	Help in habitat protection	+	◆◆	Awareness programme
						Training