Vulture Conservation Action Plan for Nepal (2009-2013)

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Government of Nepal
Ministry of Forests and Soil Conservation
Department of National Parks and Wildlife Conservation

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Acronyms

AWBV	African White-backed Vulture
BCN	Bird Conservation Nepal
BNHS	Bombay Natural History Society
BZCF	Buffer Zone Community Forest
CCTV	Closed-circuit Television
CF	Community Forest
CNP	Chitwan National Park
DDA	Department of Drug Administration
DLS	Department of Livestock Services
DNPWC	Department of National Parks and Wildlife Conservation
EGV	Eurasian Griffon Vulture
HGV	Himalayan Griffon Vulture
IEC	Information Education and Communication
IUCN	International Union for the Conservation of Nature
IVRI	Indian Veterinary Research Institute, Bareilly
LBV	Long-billed Vulture
LRP	Local Resource Person
MLE	Maximum Likely level of Exposure
MoEF	Ministry of Environment and Forests, India
MoFSC	Ministry of Forests and Soil Conservation, Nepal
NBPT	National Bird of Prey Trust
NSAID	Non Steroidal Anti Inflammatory Drugs
NTNC	National Trust for Nature Conservation
OSP	Ornithological Society of Pakistan
RSBP	Royal Society for the Protection of Birds
SBV	Slender-billed Vulture
TPF	The Peregrine Fund
VCAP	Vulture Conservation Action Plan
VCBC	Vulture Conservation and Breeding Centre
WII	Wildlife Institute of India
WRV	White-rumped Vulture
ZSL	Zoological Society of London

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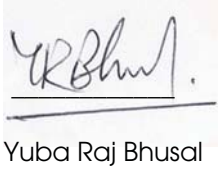
Foreword

Today, nine species of vultures have been recorded from South Asia. Of these, eight are resident and one migratory. Nepal supports six resident vulture species (white-rumped vulture *Gyps bengalensis,* slender-billed vulture *Gyps tenuirostris,* Egyptian vulture *Neophron percnopterus,* red-headed vulture *Sarcogyps calvus,* Himalayan griffon vulture *Gyps himalayensis,* and Lammergeier vulture *Gypaetus barbatus*), one winter visitor (Cinereous vulture *Aegypius monachus*) and one passage migrant (Eurasian griffon vulture *Gyps fulvus).* The long-billed vulture *Gyps indicus* is not found in Nepal.

The sharp decline in population of two species *Gyps* vultures, slender-billed vulture *Gyps tenuirostris and* the Oriental white-backed vulture *Gyps bengalensis* has become a serious concern among the conservationists. These two species have been listed as "Critically Endangered" in the IUCN Red List, the highest category of endangerment. The 3rd IUCN World Conservation Congress held in Bangkok, Thailand, in November 2004, passed a resolution on 'Conservation of *Gyps* species of Vultures in South and Southeast Asia'. The Congress also requested all the vulture range countries to develop and implement national vulture recovery plans, including conservation breeding and release.

High mortality and total breeding failure were assumed to be the major cause of population decline, but later Diclofenac, and analgesic drug widely used in livestock, has been identified as the major cause of vulture mortality. The studies have confirmed that contamination of less than 1% of livestock carcasses with lethal quantities of Diclofenac would be enough to have caused the observed vulture declines. The loss of natural habitats has also threatened the long term survival of vulture in the wild. Realizing the high risk of extinction, captive breeding of these two species of vulture have also been initiated in Kasara, Chitwan National Park. The Vulture Conservation Action Plan for Nepal (2009—2013) is a part of the greater effort of the Government of Nepal to conserve and consolidate the conservation initiatives for all vulture species found in Nepal.

The Government of Nepal, Ministry of Forests and Soil Conservation (MoFSC) greatly acknowledges the effort of the Department of National Parks and Wildlife Conservation for its dedication and hard work in bringing out this action plan. The Ministry also appreciates the contribution of the National Trust for Nature Conservation, Bird Conservation Nepal, Zoological Society of London and Royal Society for the Protection of Birds. The Ministry also appeals all to join hands in Nepal's endeavour of vulture conservation and successful implementation of the Action Plan.



Yuba Raj Bhusal
Secretary

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Executive Summary

Vultures play important role in maintaining clean environment through rapid consumption of animal carcasses and human dead bodies in the form of sky burials within Nepal and Tibet. Nine different species of vultures have been recorded from South Asia. Nepal supports six resident vulture species (white-rumped vulture *Gyps bengalensis*, slender-billed vulture *Gyps tenuirostris*, Egyptian vulture *Neophron percnopterus*, red-headed vulture *Sarcogyps calvus*, Himalayan griffon vulture *Gyps himalayensis*, and Lammergeier Vulture *Gypaetus barbatus*), one winter visitor (Cinereous vulture *Aegypius monachus*) and one passage migrant (Eurasian griffon vulture *Gyps fulvus)*.

In recent years, vulture population throughout the range states have undergone dramatic declines in numbers. Monitoring of vultures in Nepal indicate over 90% decreases in numbers from 1995 to 2009. Extensive research undertaken during the recent past has confirmed Diclofenac, anti-inflammatory drug widely used to treat livestock as the main cause of the vulture population decline. Vultures are exposed to Diclofenac when they feed carcasses of livestock containing toxic residues of the drug. The loss of vultures from the ecosystem affects the balance between population of other scavenging species and/or result in increase in putrefying carcasses.

While Diclofenac is the main cause of vulture population decline, the other causes to some extent may be the habitat loss and scarcity of food. All the accessible forests of Terai, Churia and Middle Hills are being handed over to the community as the Community Forest (CF). The CF operational plans generally prescribe to remove old (selection felling), dying and diseased trees thereby opening the area for new regeneration. This might have some level of impact on the habitat of vulture. Similarly, people now a days, prefer to rear improved breed of livestock in limited number. These livestock are preferred to bury upon death. These changes in traditional behaviour of people might have led to the scarcity of food on the other hand.

After identifying Diclofenac as the major cause of the decline of vulture population, a group of national and international organizations issued a Manifesto in January 2004 (Vulture Rescue 2004). This called for immediate action from the governments of all *Gyps* vulture range states to prevent the veterinary use of Diclofenac. Two important international meetings were held to review the scientific evidences. Key recommendations made by these meetings include: a) government authorities in all range states shall introduce legislation to prohibit all veterinary uses of Diclofenac, and b) that captive population of all three affected *Gyps* species be established immediately in South Asia for breeding and reintroduction to a Diclofenac-free environment.

Following the ban on Diclofenac, efforts were taken to promote the safe alternative drug such as Meloxicam. Within Nepal, the pharmaceutical company Medivet on its own initiative has ceased the production of Diclofenac prior to the manufacturing ban, and began actively developing the manufacture of meloxicam under the brand name 'Melox'.
In-situ conservation and availability of safe food, in combination with conservation advocacy and awareness programmes, plays an important role to

help ensure that at least some of the small remaining vulture populations remain extant. Two *in-situ* measures have been adopted to reduce mortality in the wild: a) the exchange of Diclofenac for meloxicam in areas surrounding natural breeding colonies, and b) provision of safe food near the breeding colony areas.

Asian Vulture Recovery Plan has recommended the establishment of captive holding and captive breeding facilities for three species of *Gyps* vultures at six sites in South Asia. These centres would serve as sources for reintroduction of vultures after the removal of the cause of mortality from the environment.

Despite the ban on veterinary Diclofenac production in 2006 and other conservation activities, population of vultures continue to decline across India, Pakistan and Nepal. Hence, prompt actions are needed to curb the catastrophic decline of vultures.

This Vulture Conservation Action Plan aims to revive the viable population of vultures in the wild by ensuring re-introduction, safe food supply, maintenance of suitable habitat and better understanding of the ecological importance of these birds in Nepal. Specific outputs expected from the implementation of the VCAP are:

i. Complete ban on Diclofenac and other non-tested NSAIDs secured, and alternative safe NSAIDs (including Meloxicam) promoted
ii. Level of vulture conservation awareness among general public increased
iii. Breeding population of vultures in the wild increased
iv. Captive bred population of vultures reintroduced
v. Science based information system established
vi. Partnership among national and international organizations fostered

Different activities are planned to achieve these outputs. A business plan has been developed to facilitate the implementation of VCAP. The total five year budget for the implementation of VCAP is NRs 59,971,750.

CHAPTER 1:

THE CONTEXT

1.1. Introduction and Background

Vultures play a highly important ecological role through the rapid consumption of animal carcasses. They also have an important cultural role in the consumption of human dead bodies in the form of sky burials within Nepal and Tibet. Vultures are the primary consumers of carrion in Asia and Africa, with an individual *Gyps* vulture consuming around 1 kg of tissue every three days (Mundy *et al.* 1992).

Nine species of vultures have been recorded from South Asia, of which eight are resident and one migratory. Nepal supports six resident vulture species (white-rumped vulture *Gyps bengalensis,* slender-billed vulture *Gyps tenuirostris,* Egyptian vulture *Neophron percnopterus,* red-headed vulture *Sarcogyps calvus,* Himalayan griffon vulture *Gyps himalayensis,* and Lammergeier vulture *Gypaetus barbatus*), one winter visitor (Cinereous vulture *Aegypius monachus*) and one passage migrant (Eurasian griffon vulture *Gyps fulvus)*. The long-billed vulture *Gyps indicus* is not found in Nepal.

SN	Species	Range Countries	Resident/Migratory	Conservation Status
1	White-rumped vulture	Nep, Ind, Pak, Ban	Resident breeder	Critically Endangered
2	Slender-billed vulture	Nep, Ind, Ban	Resident breeder	Critically Endangered
3	Long-billed vulture	Ind, Pak	Resident breeder	Critically Endangered
4	Himalayan griffon vulture	Nep, Ind, Pak	Resident breeder	Unspecified
5	Eurasian griffon vulture	Nep, Ind, Pak	Winter visitor	Unspecified
6	Red-headed vulture	Nep, Ind	Resident breeder	Critically Endangered
7	Egyptian vulture	Nep, Ind, Pak	Resident breeder	Endangered
8	Cinereous vulture	Nep, Ind, Pak	Winter visitor	Near Threatened
9	Lammergeier	Nep, Ind, Pak	Resident breeder	Least Concerned

Table 1.1: Status of vultures in Indian Sub-continent
(Nep = Nepal, Ind = India, Pak = Pakistan, Ban = Bangladesh)

Within Nepal, India and Pakistan vulture populations have undergone dramatic declines in numbers since the mid 1990s, with declines in excess of 97% for three resident species (white-rumped, slender-billed and long-billed vulture *Gyps indicus* now confined in India). In India, numbers of white-rumped vultures have declined by 99.9% from 1992 to 2007 (Prakash *et al.* 2007). Monitoring of vultures in Nepal indicates declines of a similar magnitude (Appendix 2) with a >90% decrease in numbers up to 2001 (Baral *et al.* 2004). As a consequence, these three *Gyps* vulture species were listed by the International Union for the Conservation of Nature (IUCN) in 2000 as Critically Endangered (IUCN 2007).

Extensive research undertaken within India, Pakistan and Nepal has established that the non-steroidal anti inflammatory drug (NSAID) Diclofenac is the main, and perhaps the only, cause of the population declines (Green *et al.* 2004; Oaks *et al.* 2004; Shultz *et al.* 2004). Vultures are exposed to Diclofenac when they feed from carcasses of livestock that have died within a few days of treatment and contain toxic residues of the drug (Oaks *et al.* 2004). Diclofenac is used for a variety of painful and inflammatory conditions in both veterinary and human medicine. Vultures that consume sufficient tissue from treated carcasses die from the effects of Diclofenac-induced kidney failure, with clinical signs of visceral gout prevalent in all birds (Oaks *et al.* 2004; Swan *et al.* 2006a). It is clear that vultures cannot survive as long as Diclofenac use continues. Hence, the first and immediate conservation priority must be to prevent the exposure of vultures to Diclofenac contaminated food.

The loss of a major scavenger from the ecosystem will affect the balance between populations of other scavenging species and/or result in increase in putrefying carcasses. In the absence of other carcass disposal mechanisms (burial, burning, mechanical processing), the decline in vultures has resulted in an increase in the number of putrefying animal carcasses in rural areas. Populations of feral dogs, the main scavenging species in the absence of vultures, have increased within India (Indian Livestock Census 2003) with packs of several hundred animals observed around carcass dumps (R. Cuthbert pers obs). Increase of rabies incidence, reported frequently in the newspapers, in Nepal may be an outcome of the increased number of feral dogs. Both increases in putrefying carcasses and changes in the scavenger populations also have associated disease risks for wildlife, livestock and humans, including the spread of rabies and livestock borne diseases like anthrax, tuberculosis and brucellosis (Prakash *et al.* 2003; Anderson *et al.* 2005).

While Diclofenac is the main cause of vulture population decline, the other causes to some extent may be habitat loss and scarcity of food. All the accessible forests of Terai, Churia, and Mid Hills are being handed over to the community as Community Forests (CF). CF operational plans generally prescribe to remove old (selection felling), dying and diseased trees thereby opening the area for new regeneration. This might have some level of impact on the habitat of vulture. Similarly, people now a days, prefer to rear improved breed of livestock in limited number. These livestock are preferred to bury upon death. These changes in traditional behaviour of the people might have led to the scarcity of food on the other hand.

This is clear from the above explanation that if some specific actions are not taken for the conservation of vultures, some species of vultures might be extinct from Nepal or may be from South Asia in near future. However, Nepal only cannot save vultures from being extinct; we need collective efforts from the South Asian countries. Each country must have a specific plan of actions for this purpose.

1.2 Efforts and Achievements

1.2.1. National and Regional Meetings

After identifying Diclofenac as the major cause of the decline of vulture populations, a group of national and international organizations (Bird Conservation Nepal (BCN), Bombay Natural History Society (BNHS), Royal Society for the Protection of Birds (RSPB), Zoological Society of London (ZSL), The Peregrine Fund (TPF) and Ornithological Society of Pakistan (OSP)) issued a Manifesto in January 2004 (Vulture Rescue 2004). This called for immediate action from the governments of all *Gyps* vulture range states to prevent the veterinary use of Diclofenac. In February 2004, two important international meetings were held to review the scientific evidence - the first was a Vulture Summit in Kathmandu and was convened by the TPF and BCN and the second was an International South Asian Recovery Plan Workshop convened by the BNHS group (ISARPW 2004). Key recommendations made by these meetings include: a) government authorities in all range states shall introduce legislation to prohibit all veterinary uses of Diclofenac; and b) that captive populations of all three affected *Gyps* species be established immediately in South Asia for breeding and reintroduction to a Diclofenac-free environment.

In early 2006, an International Conference on Vulture Conservation was held in Delhi and made following recommendations: a) the Governments of the respective countries take immediate steps to completely phase out veterinary Diclofenac; b) urgently establish vulture conservation breeding centres for the three critically endangered species; c) conduct a reliable population estimate at state, country and regional levels; d) strengthen education and awareness campaigns; e) strengthen sharing of information amongst the stakeholders; and f) set up a regional task force to initiate collaborative vulture conservation initiatives in the region.

Following the recommendations and extensive advocacy programme, the Board Members of the National Board for Wildlife recommended a ban on the veterinary use of Diclofenac in India in 17 March 2005. In May 2006, a directive from the Drug Controller General of India was circulated to relevant officials for withdrawal of manufacturing licences for veterinary Diclofenac. Similarly, the Government of Nepal - Department of Drug Administration (DDA) announced a ban on the manufacture and import of Diclofenac in Nepal in June 2006. In the same announcement, the DDA also circulated information to all the country's pharmaceutical manufacturers to produce the safe alternative drug meloxicam.

1.2.2. Alternative Drugs to Diclofenac

Following the ban on Diclofenac, efforts were made to promote the safe alternative drug in order to rapidly effect a change on Diclofenac use. In order to identify alternative NSAIDs surveys were made of the veterinary use of NSAIDs for the clinical treatment of captive vultures, raptors and other birds within zoos and wildlife rehabilitation centres. Studies have identified the NSAID meloxicam as a proven alternative. It is the NSAID of choice in Europe and North America. Meloxicam had been given to 39 *Gyps* vultures from six species and at least 700 individuals from 54 other raptor and scavenging bird species with no ill effects (Cuthbert *et al.* 2006). A number of research have shown that Meloxicam is safe for vultures (Swarup *et al.* 2007, Swan *et al.* 2006b).

Within Nepal, the pharmaceutical company Medivet on their own initiative ceased the production of Diclofenac prior to the manufacturing ban, and began actively developing the manufacture of meloxicam under the brand name 'Melox'. Surveys of pharmacies in lowland areas of Nepal indicate that meloxicam has become widely available as a veterinary NSAID but not yet as widely available as for Diclofenac previously (BCN unpublished data). Regular monitoring of veterinarians, pharmaceutical outlets and carcasses is necessary to determine the uptake of meloxicam and other NSAIDs in Nepal.

1.2.3. In-situ Conservation and Availability of Safe Food

In-situ conservation and availability of safe food, in combination with conservation advocacy and awareness programmes, plays an important role to help ensure that at least some of the small remaining vulture populations remain extant. Two in-situ measures have been adopted to reduce mortality in the wild: a) the exchange of Diclofenac for meloxicam in areas surrounding natural breeding colonies; and b) provision of safe food near the breeding colony areas. The Peregrine Fund in Pakistan provided donkeys and mules for a colony of white-rumped vultures during the 2003/04 breeding season. The results indicated that the provision of clean food was helpful to reduce mortality from Diclofenac (Gilbert *et al.* 2007).

A more comprehensive approach has been initiated in Nepal in East Nawalparasi District, and expanded in a smaller scale in Palpa, Rupandehi, Dang and Kailali Districts. In Nawalparasi, an extensive Diclofenac for meloxicam swapping programme has led to an estimated 90% reduction in veterinary Diclofenac stocks in Nawalparasi District. In conjunction with this and an advocacy programme targeted at vets, pharmacists and farmers, a vulture feeding area, or "*Jatayu Restaurant*", has been established in close proximity to the breeding colony at Pithouli village, East Nawalparasi. The restaurant acquires old cattle that are no longer fit to work. These cattle are herded and cared for until their natural death, when they are then used as a safe Diclofenac free source of food for vultures in the area. The Jatayu restaurant has now been replicated successfully in Gaidahwa Lake, Lumbini, Rupandehi District and Lalmatiya VDC of Dang District.

1.2.4. *Ex-situ Conservation*

The workshop to prepare an Asian Vulture Recovery Plan held in India in February 2004 recommended the establishment of captive holding and captive breeding facilities for three species of *Gyps* vultures at six sites in South Asia These centres would serve as sources for reintroduction of vultures after the removal of the cause of mortality from the environment.

Realizing the rapid decline (25-48% per annum) of wild populations (Green *et al.* 2004) and urgent need to establish breeding centres, Vulture Conservation Breeding Centres (VCBC) were established by the BNHS and Haryana Forest Department at Pinjore, Haryana State, India. This programme was launched with the financial and technical support from the RSPB, ZSL and National Bird of Prey Trust (NBPT). Two additional centres have been established at Raja Bhat Khawa (Buxa Tiger Reserve), West Bengal, in 2006, and Rani Forest in Assam State in 2007. These three centres currently hold 226 vultures of critically endangered species. Actions to establish a VCBC have also been initiated in Pakistan and this centre currently holds around 11 birds. The Department of National Parks and Wildlife Conservation (DNPWC), Nepal, in collaboration with National Trust for Nature Conservation (NTNC), BCN, RSPB and ZSL has established a VCBC at Kasara, Chitwan National Park. The centre currently has two holding aviaries and a breeding aviary that hold twenty-two pair of white-rumped vulture. A quarantine aviary has been set up at Biodiversity Conservation Centre (BCC) in Sauraha, Chitwan National Park.

1.3. Challenges and Opportunities

1.3.1. Population Decline

Despite the ban on veterinary Diclofenac production in 2006 and other conservation activities, populations of vultures continue to decline across India, Pakistan and Nepal. Results from field surveys indicate that in 2007 populations of white-rumped vultures in India had declined by more than 99.9% in comparison to numbers recorded in 1991-93 (Prakash *et al.* 2007). Population of long-billed and slender-billed vultures also declined by 96.8% over the same period. The average annual rate of decline in India was 44% for white-rumped vultures, and 16% for slender-billed and long-billed vultures.

Monitoring of breeding numbers of vultures in Pakistan also indicated similar levels of decline, with white-rumped vultures declining by more than 99% from 2000 to 2006 (The Peregrine Fund 2007). Similarly, studies show a 16% annual decline in white-rumped vultures from 2002 to 2009 in Nepal (BCN research). Vulture breeding sites monitored in Palpa, Syangja and Tanahu Districts indicate continued declines in Nepal. The rapid rate and continued declines in all monitored vulture populations in Nepal and South Asia indicate the urgent need for conservation actions to be fully implemented to prevent vulture species becoming extinct in South Asia.

Diclofenac is not the only source of vulture mortality or the only cause of failed nesting attempts, although it is the main, if not the only, cause of the massive decline in populations (Green *et al.* 2007). Other sources of mortality include poisoning through feeding on deliberately poisoned carcasses that are placed out to kill other animals (e.g. dogs), felling of nesting trees, especially those with active breeding attempts, disturbance and destruction of nests to prevent vultures nesting above agricultural land and dwellings, exclusion from feeding sites through disturbance or alternative carcass disposal methods (burial), and direct persecution and hunting of vultures either for medicinal purposes. In the past, when a large and healthy vulture population existed in Nepal, these additional sources of mortality would have been minor and the population was able to withstand them. However, with a very small remaining and still declining population, such additional sources of mortality may play a more significant role.

1.3.2. Risk of Continued Use of Diclofenac

The ban on manufacturing and importation of Diclofenac in Nepal, India and Pakistan has not outlawed the continued use or sale of veterinary Diclofenac. Diclofenac formulations for veterinary use - both injectable and bolus forms typically have a shelf life of 2 years and if extensive stockpiles of Diclofenac remain within Nepal then Diclofenac could continue to be legally used. Knowledge on the scale of remaining stocks of Diclofenac in Nepal and India is unknown, but if large amounts remain then Diclofenac use could continue legally on a large scale. The potential for mislabeling of manufacturing dates of Diclofenac preparations may also lead to current stocks of Diclofenac remaining in the system for longer than is desired. The extent, or occurrence, of this problem is currently unknown.

Diclofenac is widely used as effective anti-inflammatory analgesic in human medicine and it is not feasible to completely phase out human use. Diclofenac manufactured for human use is also known to be used for veterinary purpose. As long as the human use of Diclofenac continues, the possibility of diversion of human Diclofenac formulations to veterinary use is likely to occur. This applies most specifically to injectable Diclofenac formulations, as bolus preparations (orally delivered) of the dosage and size to be used for livestock treatment is likely to be specific to the veterinary sector. Preventing the diversion of human Diclofenac into the veterinary sector remains a major challenge.

1.3.3. Knowledge Base

A number of studies have been carried out to understand vultures, their biology, distribution and population dynamics in Nepal and South Asia. However, much more studies and research needs to be carried out to increase our knowledge base on vultures for effective conservation.

1.3.4. Strengths and Capacities

Partner organizations have human resources to implement the action plan and in recent years they have had opportunities to gain

knowledge and skills on vulture conservation both in India and Nepal through trainings and visits.

Additional trained human resource is required for effective implementation of action plan. Increasing numbers of national and local partners involved in vulture conservation have helped to increase the understanding of vulture biology and its conservation measures.

1.3.5. Habitat Management

Deforestation and urbanization has led to habitat shrinkage and fragmentation. While no concrete measures have been specifically adopted for vulture habitat conservation, a long standing Government ban that protected *Bombax cebia* trees from being cut down and increase in community forestry practices could have helped in maintaining suitable habitat for some vulture species. Incorporation of vulture conservation measures in the operational plan of community forests in districts with significant vulture population and supporting its implementation could be an opportunity for conserving vulture habitat.

1.3.6. Awareness

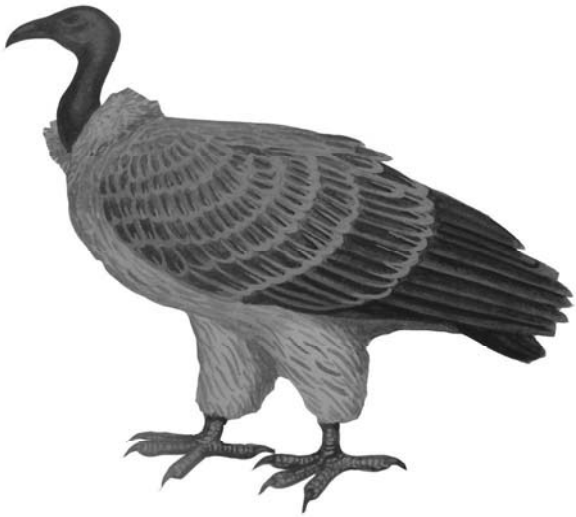
Superstitious beliefs and lack of awareness on the ecological importance of vultures as well as their population decline could be a major barrier in successfully implementing the vulture action plan. Intensive education and awareness campaign for stakeholders ranging from students, farmers to veterinary practitioners and government authorities will help to sensitize them on the plight of vultures and garner support for vulture conservation.

1.3.7. Avian Influenza

In recent years, the outbreak of avian influenza has had a profound effect on the poultry industry. However, its effect and impact on other bird species is largely unknown. Outbreak of avian influenza around captive breeding site could pose a risk to vulture species as well. Adequate measures need to be adopted to prevent such risk.

1.3.8. *International Cooperation*

As vultures know no international boundaries, their conservation is only possible through trans-boundary cooperation between vulture range countries across South Asia. The strong international collaboration between governments, conservation groups, scientists and bird lovers as well as the sharing of knowledge and skills has raised common belief that these species can be brought back from the brink of extinction. A number of international partners such as RSPB and ZSL have joined hands to initiate vulture conservation in Nepal and the vulture conservation action plan provides an opportunity for further collaboration and fund raising with existing and potential international partners.



CHAPTER 2:
VULTURE CONSERVATION ACTION PLAN

2.1 Goal

The goal of the Vulture Conservation Action Plan (VCAP) is to revive the viable population of vultures in the wild.

2.2 Objective

To prevent the extinction of vulture species by ensuring re-introduction, safe food supply, maintenance of suitable habitat and better understanding of the ecological importance of these birds in Nepal.

2.3 Outputs

The outputs of the VCAP are:

I. Complete ban on Diclofenac and other non-tested NSAIDs secured, and alternative safe NSAIDs (including Meloxicam) promoted
II. Level of vulture conservation awareness among general public increased
III. Breeding population of vultures in the wild increased
IV. Critically endangered vulture species successfully raised in captivity
V. Science based information system established
VI. Partnership among national and international organizations fostered.

OUTPUT I: Complete ban on Diclofenac and other non-tested NSAIDs secured, and alternative safe NSAIDs (including Meloxicam) promoted

Issues

Use of Diclofenac

Without the complete removal of Diclofenac, the main causative agent of the vulture declines, vulture populations in Nepal and South Asia will continue to decline and at least three species of *Gyps* vulture may become extinct in the wild. Population of four other species, resident or migratory to Nepal, is also likely to decline without the elimination of Diclofenac from Nepal and neighbouring countries.

Enforcement

Nepal has already taken key actions to prevent the use of Diclofenac through a ban on the manufacturing and importation of veterinary Diclofenac into the country since June 2006. A key loophole in achieving a complete end to veterinary Diclofenac use is that while banning the manufacture and importation of Diclofenac are two important steps, it will be impossible to achieve a complete cessation without a ban on the sale and use of veterinary Diclofenac in Nepal. Allowing its sale and use is providing a loophole for the continued use of Diclofenac stocks. Because of trade agreements and extensive open borders with India, enforcing such actions will be difficult. However, alerting customs and border officials to this issue is critical.

Inadequate promotion of alternative NSAIDs

Despite the availability of meloxicam as an alternative NSAID there is evidence for the continued use of Diclofenac. Additionally, some veterinary practitioners are unwilling to switch to meloxicam, preferring to stick with the "tried and tested" Diclofenac. Practical issues also make Diclofenac more attractive in some instances. For example, the injection form of Diclofenac is still cheaper than meloxicam; Diclofenac is a faster acting painkiller allowing a more rapid recovery of the treated animal; and confusion remains on dosages and whether pregnant animals can be safely administered meloxicam. These factors are hindering the uptake and switch to meloxicam.

Unauthorized use of human Diclofenac for veterinary purpose

The use of human Diclofenac products into the veterinary sector is another issue. The majority of this problem is likely to be in the form of using human injectable Diclofenac formulations, as human Diclofenac cannot easily be used to replace bolus formulations that are commonly used. The extent to which injectable forms of human Diclofenac are used in Nepal is currently being studied. However, evidence from India suggests that human drugs are still commonly used for treating animals (N. Shan, BNHS, unpublished data). A ban on the veterinary use of Diclofenac will help tackle this problem. However, in the absence of a ban on human Diclofenac, serious consideration needs to be given to making human Diclofenac more expensive and harder to use as a veterinary drug. This could take the form of legislation to restrict the volume of injectable human formulations to make their use impractical and more expensive when treating livestock.

Strategy

Different government bodies and conservation partners should combine their resources and efforts to restrict the importation and illegal use of Diclofenac and enforce the ban on veterinary Diclofenac. Further, the licensing of other non-tested veterinary NSAIDs in Nepal should not be allowed. Tested, safe alternative NSAIDs like meloxicam, which is already in production, should be promoted widely.

Activities

I. *Enforce the ban on the use of Diclofenac and non-tested NSAIDs*
II. *Monitor the prevalence and use of NSAIDs in veterinary practices and pharmacies across Nepal*
III. *Develop clear guidelines on the use and efficacy of other NSAIDs in collaboration with the pharmaceutical industries*
IV. *Restrict production of human Diclofenac in large vial sizes (>3 ml) and label it as "not for veterinary use".*

OUTPUT II: Level of vulture conservation awareness among general public increased

Issues

Ignorance

Ignorance of vultures and their conservation issues among the veterinary sector, related institutions and the general populace is hindering sustained and effective conservation. The veterinary sector at the local level is not fully aware of the ban on Diclofenac and availability of the alternative safe NSAID meloxicam.

Cultural belief

In some communities, vultures are regarded as bearers of ill luck and their presence and sighting are associated with death. This belief is also an obstacle in securing the confidence of the community in vulture conservation.

Strategy

Vulture conservation related materials should be produced highlighting the ecological role of vultures, the ramifications of a decline in scavengers for rural communities and animal and human health. Materials should also highlight about the cause of the problem and solutions.

Activities

I. *Develop Information Education and Communication (IEC) package for community awareness*
II. *Train and develop Local Resource Persons (LRPs) at community level capable of implementing the IEC*
III. *Conduct awareness campaigns at schools and communities*
IV. *Organize study tours among key persons of related institutions to observe vulture breeding centre and Jatayu restaurant and share current challenges of vulture conservation*
V. *Organize awareness raising workshops for veterinary practitioners and pharmaceuticals.*
VI. *Organize regular district level meetings for veterinary practitioners to discuss issues pertaining to vulture conservation.*
VII. *Declare and enforce high vulture population areas as 'Diclofenac Free Zones (DFZs)' and Jatayu (Vulture) Safe Zone (JSZ).*

VIII. *Organize workshops and seminars to sensitize conservation partners on vulture issues to include vulture conservation in their conservation programmes (e.g., radio programs, publications, awareness camps, etc.)*

OUTPUT III: Breeding population of vultures in the wild increased

Issues

Habitat destruction

Anthropogenic disturbances leading to destruction of suitable roosting and nesting trees as well as harassment have a marked impact on vultures and their survival.

Risk of contaminated food

Vultures feed exclusively on carcasses and vultures feeding in the wild are exposed to high level of risk of feeding on a carcass contaminated with Diclofenac. Vultures exposed to Diclofenac contaminated carcasses of livestock die within a few days of feeding. Even a low percentage (<1%) of livestock carcasses contaminated with Diclofenac can cause significant declines in vulture populations (Green *et al*. 2006).

Lack of direct benefit to locals

The general populace is ignorant of the ecological importance of vultures and sees no direct economic, human and animal health benefits of vulture conservation. Conservation efforts cannot be successful without the active involvement of local communities. Economic incentives could be one of the means to attract local communities to this endeavour.

Strategy

Mechanism to involve local communities in *in-situ* conservation (e.g. establishment of vulture restaurants) having dual benefits to vultures and local community need to be promoted. Conserving and restoring of habitats through safeguarding their nesting colonies, prohibition on felling nesting trees, plantation of suitable trees and minimizing disturbances.

Activities

I. *Develop guidelines for:*
- *establishing and enforcing Diclofenac free zones and Jatayu (Vulture) Safe Zone*
- *establishing and managing community-based safe feeding sites (or vulture restaurants)*
- *collection of cattle in rescue centre*
- *monitoring guidelines that includes protection of trees on private land suitable for vultures*
- *promotion of tourism and income generation activities*

II. *Support communities to establish and operate vulture restaurants in areas with large vulture population*

III. *Organize training for Local Resource Persons to implement community-based monitoring guidelines*

IV. *Incorporate vulture conservation mechanism in operational plans of CFs and Buffer Zone CFs and support to protect suitable trees in such sites*

V. *Zoning of sites in CFs and Buffer Zone CFs with large vulture colonies as protected vulture breeding colonies*

VI. *Encourage plantation of trees (both in community and private land) suitable for vulture roosting and nesting*

VII. *Recognize and reward communities and individuals for their effort in vulture conservation*

OUTPUT IV: Critically endangered vulture species successfully raised in captivity

Issues

Population

Vulture populations have declined to the extent that some species are likely to be extinct if urgent measures are not taken. One of the measures is captive breeding and reintroduction of vultures into the wild after the external environment is deemed safe for them.

Avian Influenza

Avian influenza outbreak has been reported in the neighbouring countries like India and Bangladesh and recently in eastern Nepal. Although the effect of influenza has been so far only reported in domestic poultry, its effect on other bird species is largely unknown. The outbreak of avian influenza could eventually affect the vultures both in captive and in wild populations. As the captive breeding centre is located in the Chitwan valley, a major poultry production area, there is potentially a high risk to the captive breeding vultures.

Strategy

The establishment of a vulture conservation breeding centre within Nepal and re-introducing vultures into the wild after ensuring the major threats (principally Diclofenac) in the environment are addressed. The release of birds is anticipated to eventually lead to the restoration of a single wild population of around 100 pairs 16 or more years later.

Careful consideration needs to be given to the long-term commitment and funding such a centre would require, which may necessitate keeping birds in captivity for 15-20 years. Consideration also needs to be given to making sure that efforts to establish a captive facility do not undermine other conservation efforts that have already been implemented in Nepal, such as *in-situ* conservation activities and the removal of Diclofenac. Vultures should only be procured from those areas of Nepal where populations cannot be protected and where there is evidence for continued declines and threats.

Avian influenza has been emerging as a new threat to bird population. The outbreak of influenza could eventually affect the vultures in captivity. Therefore, preventive measures are urgently required to reduce the risk to birds within the VCBC, as well as legal dispensation to ensure that captive and wild vulture populations are not affected by designated actions in the event of an outbreak (culling of poultry and captive birds within a 5 km radius of a point of outbreak).

Activities

I. *Construct breeding, quarantine, hospital and display aviary*
II. *Increase capacity of human resource base for capture, aviary management and veterinary care*
III. *Capture 25 pairs of each critically endangered vultures for VCBC, Kasara*
IV. *Develop mechanism for supply of safe and Diclofenac-free food to vultures in captivity*
V. *Carry out regular health check ups to ensure good health and to prevent outbreak of disease such as avian influenza*
VI. *Create Emergency Fund for crisis management*
VII. *Fully equip VCBC with necessary facilities for management and scientific study, including CCTV facilities for monitoring*
VIII. *Establish visitor information centre, including CCTV display facilities for awareness*
IX. *Develop and implement vulture release plan*
X. *Encourage and support local communities in supply of safe food (e.g., rabbit, guinea pig, goat, buffalo, etc.)*

OUTPUT V: Science based information system established

Issues

Lack of sufficient information

The scientific information available on vultures in Nepal is scant and limited to specific sites and localities. Appropriate conservation efforts cannot be achieved without strong knowledge base on this species.

Inadequate skilled human resource

Inadequate human resources, technical skills and physical capacity to gather and process necessary information on vultures

Strategy

Enhance knowledge and information base on vultures based on scientific research using tested methods at regular intervals and strengthen necessary human and physical capacity for enhancing continuous work on vultures. In addition, efforts should be made to establish an effective networking mechanism and institutional arrangements for information sharing and coordination.

Activities

I. *Establish and maintain a central database on vultures of Nepal*
II. *Organize annual meeting of vulture conservation partners (national and/or regional)*
III. *Prepare and share progress reports and newsletters among conservation partners and donors*
IV. *Establish a website on vulture conservation of Nepal and link to partner organization websites*
V. *Identify and monitor nesting colonies of vultures with geo-reference*
VI. *Monitor population trends of critically endangered vulture species through regular transect surveys*

VII. *Undertake sampling of livestock carcasses that are available to vultures to quantify levels of Diclofenac contamination*

VIII. *Build institutional capacities of partner organizations in vulture conservation through training and higher studies.*

OUTPUT VI: Partnership among national and international organizations fostered

Issue

Weak collaboration among vulture range countries and related partner organizations and inadequate financial resources has hindered effective management of natural habitat and captive breeding of vultures.

Strategy

Establish effective collaboration among vulture range countries and related partner organizations and build a mechanism to ensure necessary funding for *in-situ* and *ex-situ* conservation.

Activities:

i) *Identify relevant institutions and develop mechanisms for effective collaboration*
ii) *Organize regional/international workshop in one of the vulture range countries to share experiences*
iii) *Organize exchange visits among field staffs working in captive breeding centres and responsible managers*
iv) *Develop proposals jointly by conservation partners to raise sufficient funds for the implementation of vulture conservation action plan*
v) *Develop mechanism for member sponsorship for vulture conservation programme*

2.4 Business Plan

2.4.1 Institutional Arrangements

Upon the endorsement from the Ministry of Forests and Soil Conservation, DNPWC will be responsible for the implementation of Vulture Conservation Action Plan. Other partners shall assist DNPWC for implementing specific activities, raise funds and provide technical inputs.

A Project Management Committee (PMC) will be formed both at the central and local levels to ensure effective coordination and smooth implementation of the VCAP. At the central level, a Vulture Conservation Action Plan Central Coordination Committee (VCAP CCC) will be formed to provide technical advisory role, policy guidance and coordination. The committee will comprise Director General of DNPWC, Member Secretary of NTNC, Chief Executive Officer of BCN, Country Representative of WWF Nepal Program and representatives from RSPB and ZSL.

At the local level, Project Implementation Committee (PIC) will be formed to ensure effective management and implementation of the specific project. For example, to manage the VCBC, PIC will consist of Chief Warden (Chitwan National Park) who will serve as the Project Coordinator and NTNC/BCC Project Chief, Vulture Conservation Officer from BCN and representatives from Buffer Zone Management Committee (BZMC) will be the members of PIC.

2.4.2 Human Resources

DNPWC and partner organizations shall try to mobilize their existing human resources for the implementation of VCAP. However, some additional human resources are required to implement some specific programmes proposed in VCAP such as for the management of Vulture Conservation and Breeding Centre some additional staffs are required.

The proposed human resources are as follows:

Staffing	**Department of National Parks and Wildlife Conservation**	**National Trust for Nature Conservation**
Existing	• Project Coordinator • Project Manager	• Senior keeper • Keepers x3
Required		• Veterinary Officer • Account/Administration Assistant • Foreman/security

Similarly, human resource requirement for *in-situ* conservation work is as follows:

	Bird Conservation Nepal	**Local Communities**
Existing	• Vulture Conservation Officer • Field Biologist • Veterinary Officer • Community Mobilization Officer	• Community Service Assistants x3 • Cow farm caretakers x 4 • Nest monitoring assistants x7
Required	• Programme Manager • Communication Officer • Field Biologist • Database Assistant • Ranger	• Community Service Assistants x5 • Cow farm caretakers x 5 • Nest monitoring assistants x10

2.4.3 Physical Resources

While using existing physical resources of DNPWC and partner organizations, some of the programmes and activities proposed in VCAP demand some additional physical resources. For example, to implement Vulture Conservation Breeding Programme, the following additional physical resources are required:

- Two holding aviaries
- Two breeding aviaries
- Quarantine aviary
- Hospital aviary
- Display aviary
- Information centre
- Safe water supply
- Livestock and butcher sheds for safe food supply
- Waste disposal centre
- Equipments
- Furniture
- Vehicles
- Office and laboratory

Similarly, for *in-situ* conservation sites (Jatayu restaurants) the following infrastructures are required:

- Cow rescue centres x 3
- Information centre buildings/offices x 2
- Viewing houses x 2
- Fenced grazing areas x 2
- Vermi-compost sheds x 4

2.4.4 Financial Requirements

	Year					
	1	2	3	4	5	**Total**
Administrative cost	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	**9,157,650**
Programme cost	9,824,000	15,120,000	8,110,000	10,011,000	7,749,100	**50,814,100**
Total cost (NRs)	**11,324,000**	**16,770,000**	**9,925,000**	**12,007,500**	**9,945,250**	**59,971,750**

2.4.5 Implementation

As stated earlier, DNPWC will join hand with other partner organizations to implement VCAP. At the national level, NTNC and BCN are already supporting DNPWC for vulture conservation initiatives. International organizations such as RSPB, ZSL, National Bird of Prey Trust, Darwin Initiative, WWF Nepal and International Trust for nature Conservation have been contributing technical and financial support. Further partnerships will be developed with INGOs, NGOs, government line agencies and CBOs for full implementation of VCAP. Implementation of the South Asian Vulture Recovery Plan and its recommendations will be done through collaboration with regional partners from India and Pakistan. Partnership with the Department of Livestock Services (DLS) and Department of Drug Administration (DDA) will be developed to promote the use of safe drugs such as Meloxicam and other alternative safe NSAIDs.

2.4.6 Monitoring and Evaluation

VCAP CCC will be responsible for the overall monitoring and evaluation of VCAP implementation.

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APPENDICES

Appendix 1: Photographs of vulture species of Nepal

Photo 1: Slender-billed vulture

Photo 2: Red-headed vulture

Photo 3: White-rumped vulture

Photo 4: Egyptian vulture

Photos: James Irons, Anand Chaudhary, Richard Cuthbert and http://www.neophron.com/gallery/05_07.jpg respectively.

Photo 5: Cinereous vulture

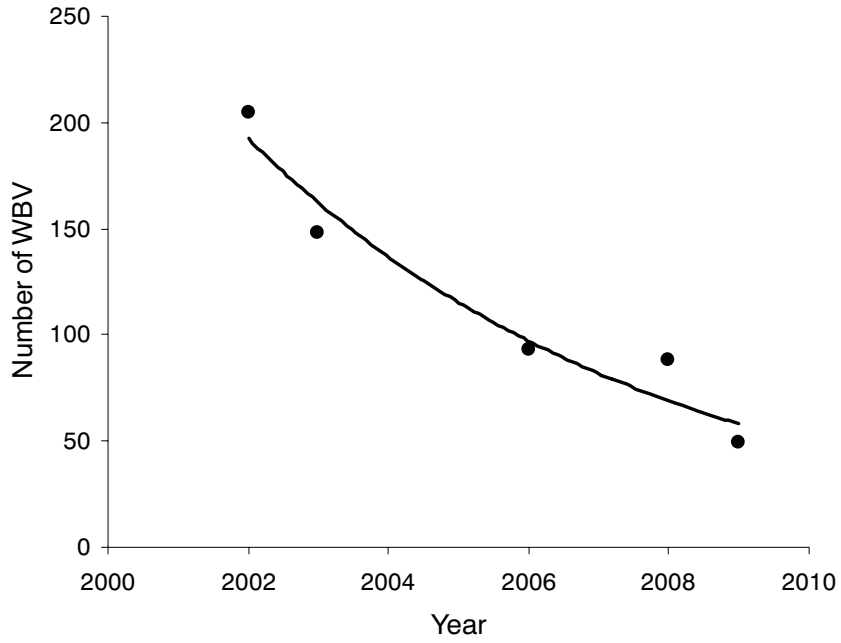
Photo 6: Eurasian griffon vulture

Photo 7: Himalayan griffon vulture

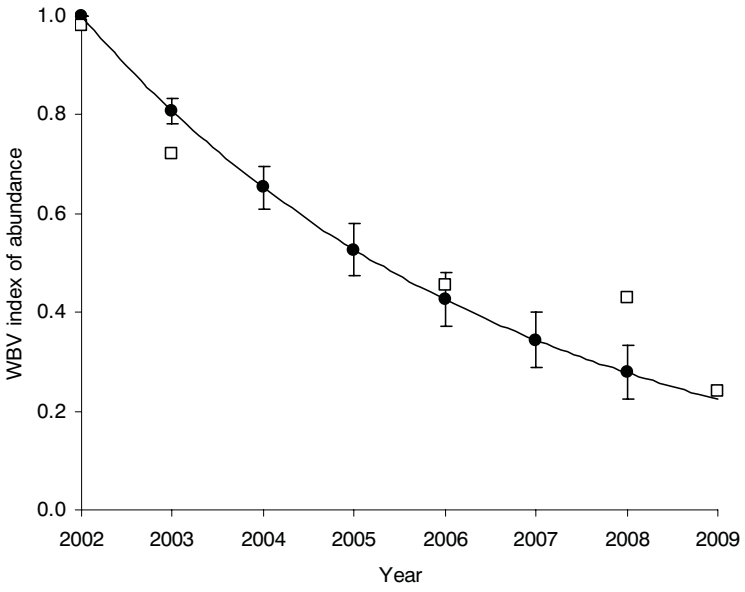
Photo 8: Lammergeier

Photos: Tulsi Subedi, http://blog.lifejacketadventures.com/wp-content/uploads/2008/06/griffon_vulture1.jpg, Jianqtian Dong-Orientalbirdimages.org and Richard Bartz respectively

Appendix 2: Trend of vulture decline in Nepal

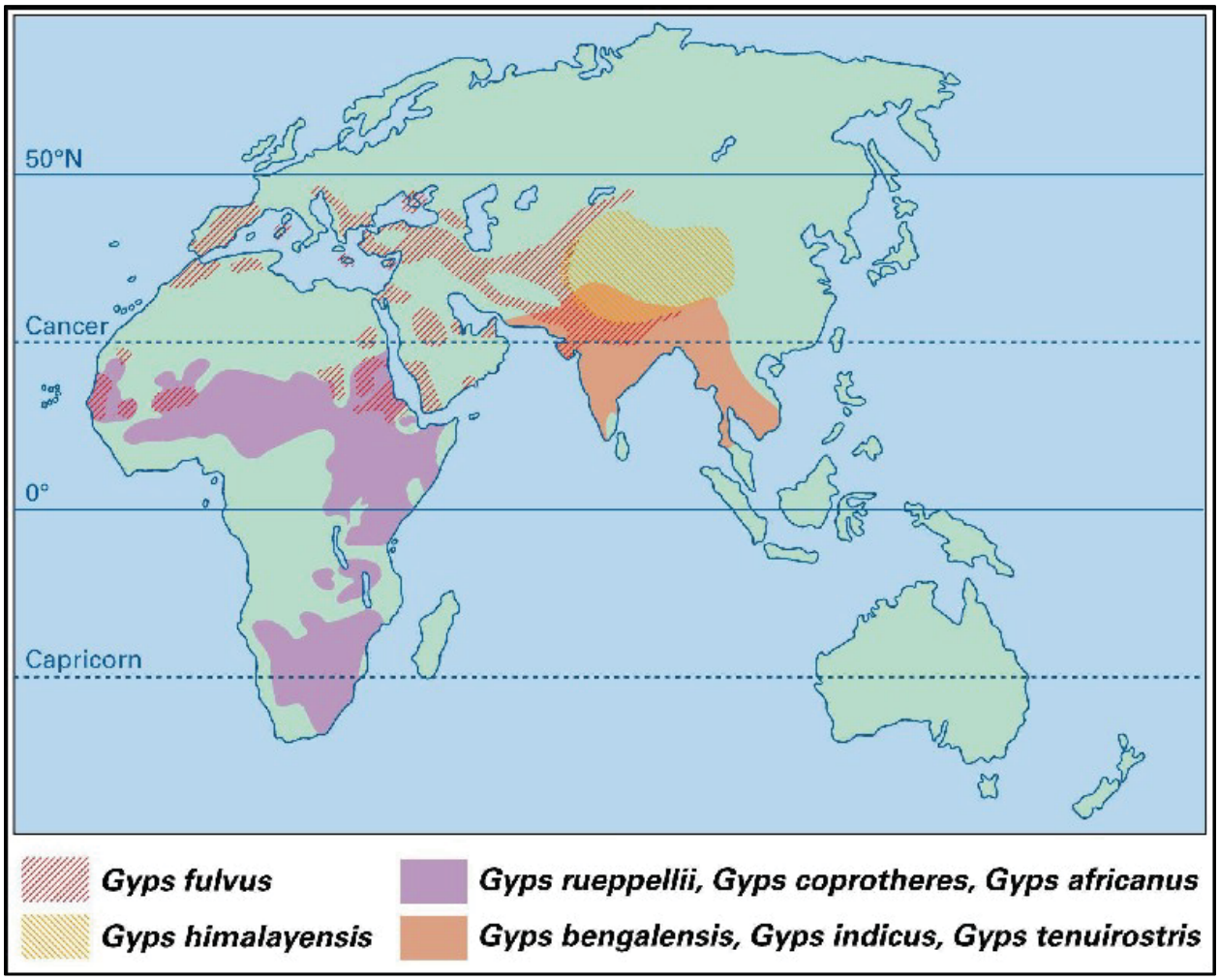


Total number of Oriental white-backed vultures (WBV) recorded along road transects along the East-West Highway in lowland areas of Nepal (from Chitwan to Mahendranagar) and fitted line of the exponential decline. The decline is statistically significant ($F_{1,3} = 31.78$, $P < 0.02$) and well fitted by an exponential decline ($R^2 = 0.914$)



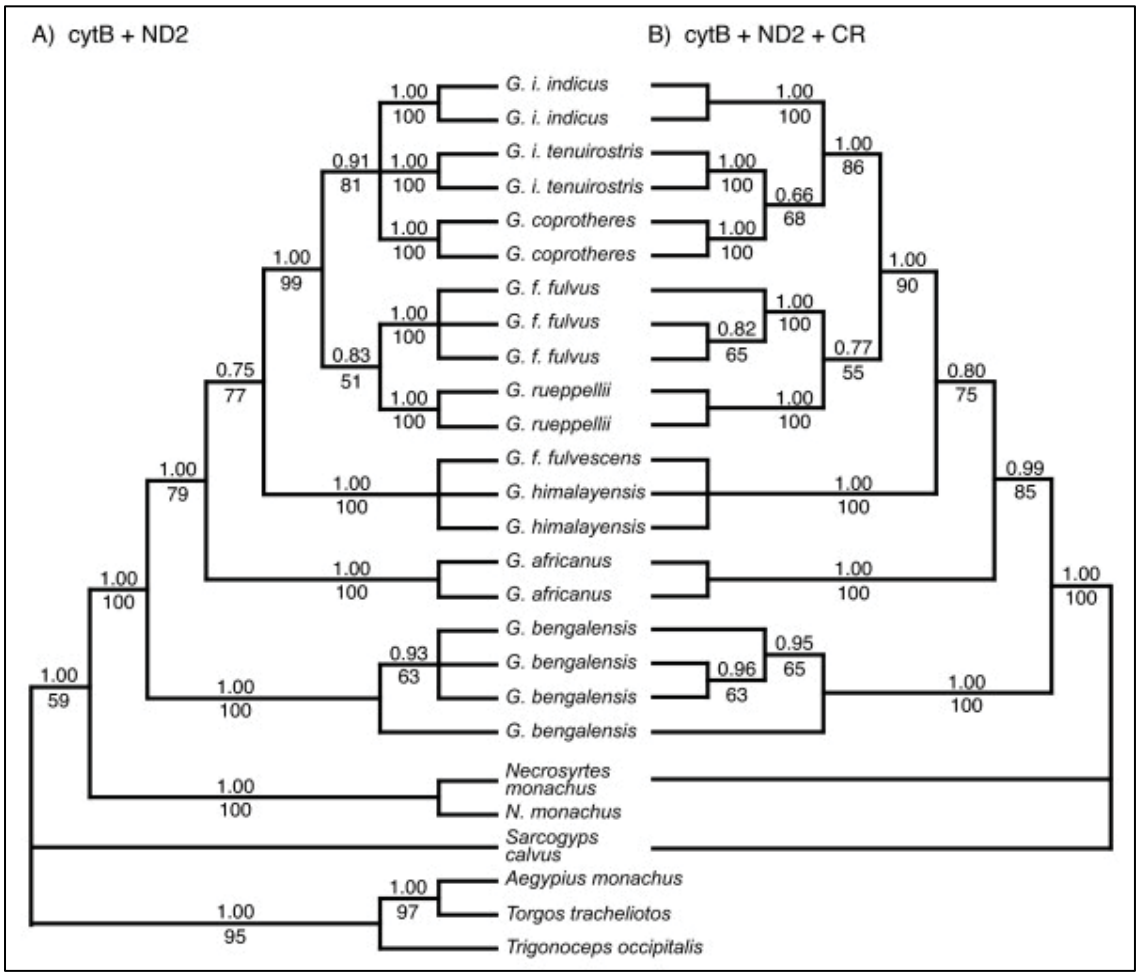
Index of abundance for Oriental white-backed vultures (WBV) monitored at 12 breeding colonies in lowland and hill areas of Nepal. Unfilled squares represent the measured index (weighted for colony size), filled circles are the regression models estimated best-fit to the data (error bars are standard errors) and the best-fit exponential rate of decline (thin curved line). The decline is statistically significant (Wald-tests $w = 18.82$, $d.f. = 1$, $P < 0.0001$) with annual rates of decline estimated to be occurring at 19% a year.

Appendix 3: Geographical distribution of vulture species



Range map for the eight species of *Gyps* vulture indicating the geographical distribution of the three Critically Endangered resident species in Asia (*Gyps bengalensis, Gyps indicus* and *Gyps tenuirostris*), the three resident species within Africa (*Gyps rueppellii, Gyps coprotheres* and *Gyps africanus*) and the migratory *Gyps fulvus* and *Gyps himalayensis*

Appendix 4: Phylogeny



Phylogeny for the eight species within the genus Gyps vultures based on combined mt ND2 and cytB datasets (A) and combined CR, ND2, and cytB datasets (B). Out groups in the phylogenetic tree are the hooded vulture Necrosytes monachus*, red-headed vulture* Sarcogyps calvus*, Cinereous vulture* Aegypius monachus*, lappet-faced vulture* Torgos tracheliotos*, and white-headed vulture* Trigonoceps occipitalis *(Johnson et al. 2006).*

Appendix 5:

Table 1: Five Years Costing of Vulture Conservation Action Plan (2009—2013)

Objective/*Activities*	Year 1	2	3	4	5	Total
Output I: Complete ban on Diclofenac and other non-tested NSAIDs secured, and alternative safe NSAIDs (including Meloxicam) promoted						
Activities						
i) Enforce the ban on the use of diclofenac and non-tested NSAIDs	50,000		50,000			**100,000**
ii) Monitor the prevalence and use of NSAIDs in veterinary practices and pharmacies across Nepal	200,000	200,000	150,000	100,000	100,000	**750,000**
iii) Develop clear guidelines on the use and efficacy of other NSAIDs in collaboration with the pharmaceutical industries	200,000					**200,000**
iv) Restrict production of human diclofenac in large vial sizes (>3ml) and label it as "not for veterinary use".		150,000		150,000		**300,000**
Output II: Level of vulture conservation awareness among general public increased						
Activities						-
i) Develop Information Education and Communication (IEC) package for community awareness	200,000		100,000		100,000	**400,000**
ii) Train and develop Local Resource Persons (LRPs) at community level capable of implementing the IEC	150,000	50,000	150,000	75,000	100,000	**525,000**
iii) Conduct awareness campaign at schools and communities	400,000	500,000	550,000	550,000	550,000	**2,550,000**
iv) Organize study tours among key persons of related institutions to observe vulture breeding center and Jatayu restaurant and share current challenges of vulture conservation	200,000	200,000	200,000	200,000	200,000	**1,000,000**
v) Organize awareness raising workshops for veterinary practitioners and pharmaceuticals	300,000	300,000	150,000	100,000	100,000	**950,000**
vi) Organize regular district level meetings for veterinary practitioners to discuss issues pertaining to vulture conservation	150,000	150,000	175,000	175,000	175,000	**825,000**
vii) Declare and enforce high vulture population areas as 'Diclofenac Free Zones (DFZs)'and Jatayu (Vulture) Safe Zones (JSZ)	150,000	100,000	100,000	100,000	100,000	**550,000**
viii) Organize workshop and seminars to sensitize conservation partners on vulture issues to include vulture conservation in their conservation programs (e.g., radio programs, publications, awareness camps, etc.)	400,000	400,000	450,000	450,000	500,000	**2,200,000**

Table 1 -contd

Objective/*Activities*	Year 1	2	3	4	5	Total
Output III: Breeding population of vultures in the wild increased						
Activities						-
i) Develop guidelines for: • *establishing and enforcing Diclofenac Free Zones and Jatayu (Vulture) Safe Zones,* • *establishing and managing community based safe feeding sites (or vulture restaurants),* • *collection of cattle in rescue centre* • *monitoring guidelines that includes protection of trees on private land suitable for vultures* • *promotion of tourism and income generation activities*	250,000	150,000		100,000		**500,000**
ii) Support communities to establish and operate vulture restaurants in areas with large vulture population	600,000	650,000	700,000	800,000	900,000	**3,650,000**
iii) Organize training for Local Resource Persons to implement community based monitoring guidelines		200,000	200,000	200,000	200,000	**800,000**
iv) Incorporate vulture conservation mechanism in operational plans of CFs and Buffer Zone CFs and support to protect suitable trees in such sites	50,000	75,000	75,000	75,000	75,000	**350,000**
v) Zoning of sites in CFs and Buffer Zone CFs with large vulture colonies as protected vulture breeding colonies	50,000	50,000	50,000	50,000	50,000	**250,000**
vi) Encourage plantation of trees (both in community and private land) suitable for vulture roosting and nesting	150,000	100,000	100,000	100,000	100,000	**550,000**
vii) Recognize and reward communities and individuals for their effort in vulture conservation	50,000	50,000	50,000	50,000	50,000	**250,000**
Output IV: Critically endangered vulture species successfully raised in captivity						
Activities						
i) Construct breeding, quarantine, hospital and display aviary		6,000,000		2,000,000		**8,000,000**
ii) Increase capacity of human resource base for capture, aviary management and veterinary care	150,000		200,000		250,000	**600,000**
iii) Capture 25 pairs of each critically endangered vultures for VCBC, Kasara	500,000	500,000	500,000	250,000	250,000	**2,000,000**
iv) Develop mechanism for supply of safe and Diclofenac free food to vultures in captivity	1,000,000	1,100,000	1,210,000	1,331,000	1,464,100	**6,105,100**
v) Carry out regular health check ups to ensure good health and to prevent outbreak of disease such as avian influenza	100,000	150,000	200,000	225,000	250,000	**925,000**
vi) Create Emergency Fund for crisis management	500,000	500,000	500,000	500,000	500,000	**2,500,000**

Table 1 –contd.

Objective/*Activities*	Year 1	2	3	4	5	Total
vii) Fully equip VCBC with necessary facilities for management and scientific study, including CCTV facilities for monitoring	250,000	250,000	250,000	100,000	100,000	**950,000**
viii) Establish visitor information centre including CCTV display facilitiesfor awareness			650,000		100,000	**750,000**
ix) Develop and implement vulture release plan					100,000	**100,000**
x) Encourage and support local communities in supply of safe food (e.g., rabbit, guinea pig, goat, buffalo, etc.)	600,000	200,000				**800,000**
Output V: Science based information system established						
Activities						
i) Establish and maintain a central database on vultures of Nepal	100,000	50,000	50,000	50,000	50,000	**300,000**
ii)Organize annual meeting of vulture conservation partners (national and/or regional)	100000	100,000	100,000	100,000	100,000	**500,000**
iii) Prepare and share progress reports and newsletters among conservation partners and donors	100,000	100,000	100,000	100,000	100,000	**500,000**
iv) Establish a website on vulture conservation of Nepal and link to partner organization websites	50000	20000	25000	30000	35000	**160,000**
v) Identify and monitor nesting colonies of vultures with geo-reference	150,000	175,000	200,000	200,000	250,000	**975,000**
vi) Monitor population trends of critically endangered vulture species through regular transect surveys	300,000	150,000	300,000	150,000	300,000	**1,200,000**
vii) Undertake sampling of livestock carcasses that are available to vultures to quantify levels of Diclofenac contamination	200,000		225,000		250,000	**675,000**
viii) Build institutional capacities of partner organizations in vulture conservation through trainings and higher studies.		500,000		750,000		**1,250,000**
Output VI: Partnership among national and international organizations fostered						
Activities						
i) Identify relevant institutions and develop mechanisms for effective collaboration		50,000		50,000		**100,000**
ii) Organize regional/international workshop in one of the vulture range countries to share experiences	500,000	100,000	100,000	500,000	100,000	**1,300,000**
iii) Organize exchange visits among field staffs working in captive breeding centres and responsible managers	200,000	200,000	200,000	200,000	200,000	**1,000,000**
iv) Develop proposals jointly by conservation partners to raise sufficient funds for the implementation of vulture conservation action plan		150,000		200,000		**350,000**
v) Develop mechanism for member sponsorship for vulture conservation programme	50,000		50,000		50,000	**150,000**
Sub-total NRs (A)	**8,400,000**	**13,620,000**	**8,110,000**	**10,011,000**	**7,749,100**	**47,890,100**

Objective/*Activities*	Year					
	1	2	3	4	5	Total
Additional Activities						
Infrastructure						
Water supply system	1,000,000					1,000,000
Equipment						-
Computer, printer, camera, GPS, telephone, mobile phone, fax, etc.	200,000					200,000
Transportation						-
Motorbike	200000					200,000
Vehicles (pick-up 4-wheel)		1,500,000				1,500,000
Rikshaw and bicycles-3	24,000					24,000
Administrative						-
Recurrent administrative expenses *	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	9,157,650
Sub-total NRs (B)	**2,924,000**	**3,150,000**	**1,815,000**	**1,996,500**	**2,196,150**	**12,081,650**
Grand Total NRs (A+B)	**11,324,000**	**16,770,000**	**9,925,000**	**12,007,500**	**9,945,250**	**59,971,750**

** This recurrent cost is only for VCBC management in Kasara, Chitwan National Park*

	Year					
	1	2	3	4	5	Total
Administrative cost	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	**9,157,650**
Programme cost	9,824,000	15,120,000	8,110,000	10,011,000	7,749,100	**50,814,100**
Total cost (NRs)	**11,324,000**	**16,770,000**	**9,925,000**	**12,007,500**	**9,945,250**	**59,971,750**

Appendix 6

Table 2: Logical Framework of the Vulture Conservation Action Plan

Hierarchy of Objectives	Objectively Verifiable Indicators	Means of Verification	Risks/Assumptions
Goal: Revive the viable population of vultures in the wild			
Objective: To restore vulture population in wild by ensuring re-introduction, safe food supply, management of suitable habitat and better understanding of the ecological importance of these birds	By 2014, • 25 pairs each of critically endangered vulture species successfully raised in the captivity • Increase in vulture population in wild by 10% as of 2009 base line	• Reports of partner organization, VCBC project report • Survey reports	• All critically endangered vulture species are available for captive breeding. • Veterinary personnel stop using human diclofenac for veterinary purpose
Outputs: 1. Complete ban on Diclofenac and other non-tested NSAIDs secured, and alternative safe NSAIDs (including Meloxicam) promoted	By 2014, • Veterinary diclofenac and other non-tested NSAIDs not available for use in Nepal • Safe NSAIDs as alternative to diclofenac easily available throughout Nepal	• DDA/DLS directives • DDA records • NSAID survey reports • Carcass study reports • VCBC project report	Political stability prevails in the country to implement rules, regulations and directives effectively.
2. Level of vulture conservation awareness among general public increased	By 2014, • Incidence of killing and poisoning of vulture decreases by 50% based on 2009 base line • Number of community managed vulture restaurants increased by 5 units • In vulture range districts, at least 20 CF/BZ operational plan incorporate vulture conservation program • Number of site-based support groups contributing to vulture conservation increases by 10 units	• Survey reports • VCBC project report	General public are more receptive towards the overall role vultures have in the ecosystem

3. Breeding population of vultures in the wild increased	• Increase by 20% in diclofenac free carcasses available annually as food for vultures in areas with high population • Vulture nesting sites increased by 10% annually	• Survey reports • VCBC project report	• Safe alternative NSAIDs available in the market
4. Critically endangered vultures species successfully raised in captivity	By 2014, • At least 25 pairs each of critically endangered vultures are raised in captivity	• VCBC project report	All critically endangered vulture species are available for captive breeding
5. Science based information system established	By 2014, • Nesting colonies of vultures identified, mapped and monitored • At least one vulture expert trained in each partner organization • Biology and conservation status of each vulture species studied/documented • Central database with specific information on vulture operational and updated annually	• Database • Survey reports • Reports of partner organizations • VCBC project report	Partners input vulture related information to strengthen the central database system
6. Partnership among national and international organizations fostered	By 2014, • Regular funding support from the partner organizations both nationally and internationally • At least one national and regional meetings organized each year • Regular technical backstopping from the partner organizations	• MoUs / Agreements, Letter of support • Reports of partner organizations	Adequate funding and technical support is readily available
Output 1/Activities: • *Enforce the ban on the use of diclofenac and non-tested NSAIDs* • *Monitor the prevalence and use of NSAIDs in veterinary practices and pharmacies across Nepal* • *Develop clear guidelines on the use and efficacy of other NSAIDs in collaboration with the pharmaceutical industries* • *Restrict production of human diclofenac in large vial sizes (>3ml) and label it as "not for veterinary use".*			

Outputs 2/*Activities*: • *Develop Information Education and Communication (IEC) package for community awareness* • *Train and develop Local Resource Persons (LRPs) at community level capable of implementing the IEC* • *Conduct awareness campaign at schools and communities* • *Organize study tours among key persons of related institutions to observe vulture breeding center and Jatayu restaurant and share current challenges of vulture conservation* • *Organize awareness raising workshops for veterinary practitioners and pharmaceuticals* • *Organize regular district level meetings for veterinary practitioners to discuss issues pertaining to vulture conservation* • *Declare and enforce high vulture population areas as 'Diclofenac Free Zones (DFZs)' and Jatayu (Vulture) Safe Zone (JSZ)* • *Organize workshop and seminars to sensitize conservation partners on vulture issues to include vulture conservation in their conservation programs (e.g., radio programs, publications, awareness camps, etc.)*			
Outputs 3 /*Activities*: ▪ *Develop guidelines for:* • *establishing and enforcing diclofenac free zones and Jatayu (Vulture) Safe Zone (JSZ)* • *establishing and managing community based safe feeding sites (or vulture restaurants),* • *collection of cattle in rescue centre* • *monitoring guidelines that includes protection of trees on private land suitable for vultures*			

• *promotion of tourism and income generation activities* ▪ *Support communities to establish and operate vulture restaurants in areas with large vulture population* ▪ *Organize training for Local Resource Persons to implement community based monitoring guidelines* ▪ *Incorporate vulture conservation mechanism in operational plans of CFs and Buffer Zone CFs and support to protect suitable trees in such sites* ▪ *Zoning of sites in CFs and Buffer Zone CFs with large vulture colonies as protected vulture breeding colonies* ▪ *Encourage plantation of trees (both in community and private land) suitable for vulture roosting and nesting* ▪ *Recognize and reward communities and individuals for their effort in vulture conservation*			
Outputs 4 /*Activities*: ▪ *Construct breeding, quarantine, hospital and display aviary* ▪ *Increase capacity of human resource base for capture, aviary management and veterinary care* ▪ *Capture 25 pairs of each critically endangered vultures for VCBC, Kasara* ▪ *Develop mechanism for supply of safe and diclofenac free food to vultures in captivity* ▪ *Carry out regular health check ups to ensure good health and to prevent outbreak of disease such as avian influenza* ▪ *Create Emergency Fund for crisis management* ▪ *Fully equip VCBC with necessary facilities for management and scientific study, including CCTV facilities for monitoring* ▪ *Establish visitor information centre, including CCTV display facilities for awareness*			

▪ *Develop and implement vulture release plan* ▪ *Encourage and support local communities in supply of safe food (e.g., rabbit, guinea pig, goat, buffalo, etc.)*			
Outputs 5 /*Activities*: ▪ *Establish and maintain a central database on vultures of Nepal* ▪ *Organize annual meeting of vulture conservation partners (national and/or regional)* ▪ *Prepare and share progress reports and newsletters among conservation partners and donors* ▪ *Establish a website on vulture conservation of Nepal and link to partner organization websites* ▪ *Identify and monitor nesting colonies of vultures with geo-reference* ▪ *Monitor population trends of critically endangered vulture species through regular transect surveys* ▪ *Undertake sampling of livestock carcasses that are available to vultures to quantify levels of diclofenac contamination* ▪ *Build institutional capacities of partner organizations in vulture conservation through trainings and higher studies.*			
Outputs 6 /Activities: *i) Identify relevant institutions and develop mechanisms for effective collaboration.* *ii) Organize regional/international workshop in one of the vulture range countries to share experiences* *iii) Organize exchange visits among field staffs working in captive breeding centres and responsible managers* *iv) Develop proposals jointly by conservation partners to raise sufficient funds for implementation of vulture conservation action plan* *v) Develop mechanism for member sponsorship for vulture conservation programme*			

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SAVE VULTURE : SAVE ENVIRONMENT

stop the use of Diclofenac and analgesic drugs!

The Vulture Conservation Action Plan for Nepal (2009–2013) has been prepared in collaboration with Bird Conservation Nepal and National Trust for Nature Conservation