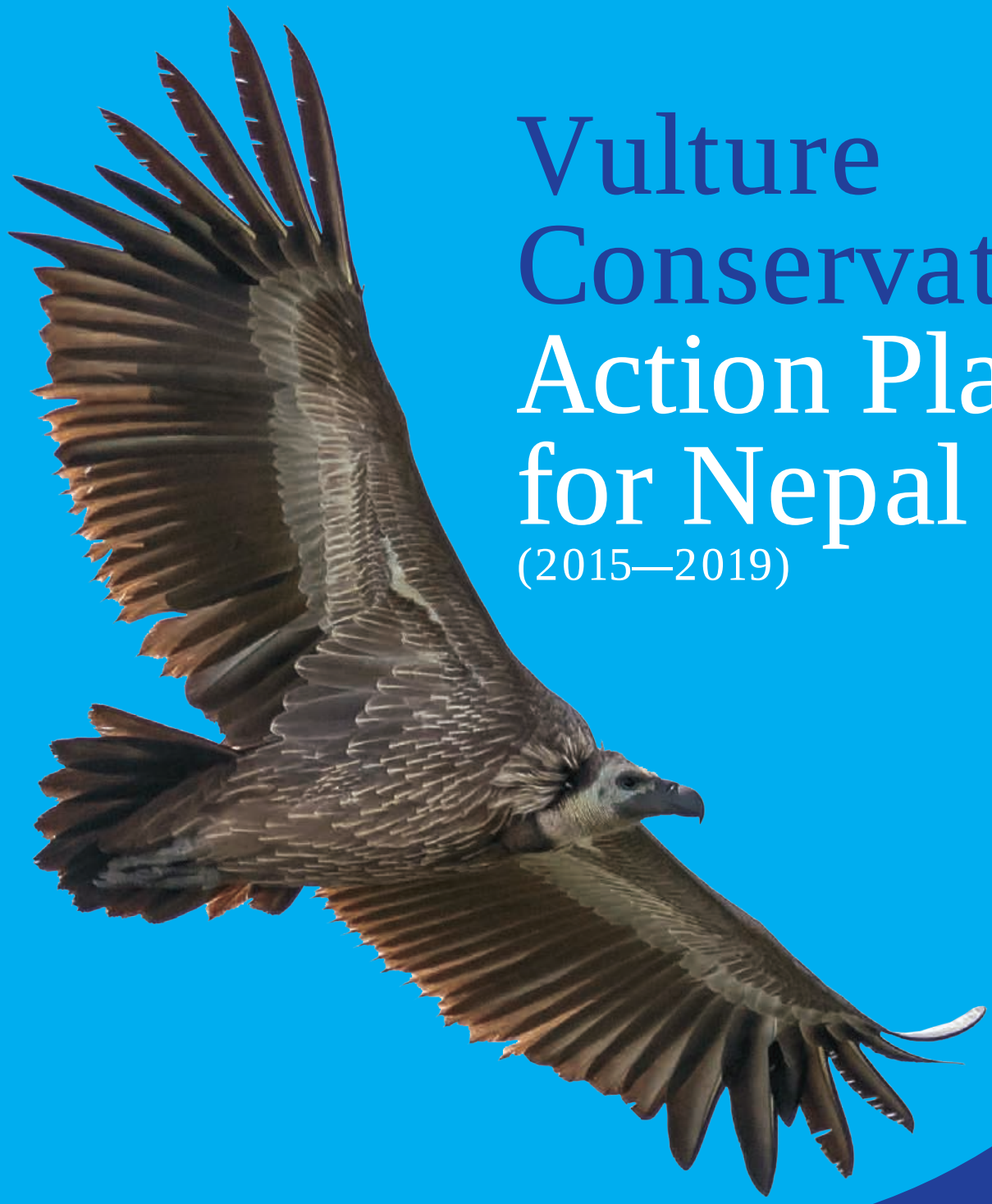

Vulture Conservation Action Plan for Nepal

(2015—2019)

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

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Front Cover Photo: White-rumped Vulture, © Tulsi Subedi
Back Cover Photo: Bearded Vulture, © Tulsi Subedi

Government of Nepal
Ministry of Forest & Soil Conservation
Department of National Parks & Wildlife Conservation

Government of Nepal
Ministry of Forest & Soil Conservation
Dept. of National Parks & Wildlife Conservation
2037

Foreword

Nepal has a diverse landscape, biodiversity richness and its distribution. Altitudinal ranges from low land *'terai'* to the roof of the world; *'Mt. Everest'* has great influence in biodiversity richness. Moreover, wildlife abundance, their migration and dispersals are assorted in nature and makes interesting to research. More than 871 species of birds are recorded in Nepal. Majority of the birds are native to Nepal while some species are migratory in nature. Considering biodiversity hot spots focusing to the protected areas, twenty-seven important bird areas have been identified at various parts of the country. Like other wildlife, birds are also facing their habitat loss, poaching and illegal trade, and as a result bird populations are constantly declining so rapidly in their ranges.

Nine species of vultures are recorded in Nepal. The populations of vulture species have been declining in their ranges because of *Diclofenac,* the drug used to treat livestock in South Asian region that has been proved to be causing declined the vulture populations in 2004. The Governments of this region have banned to use the drug *'Diclofenac'* in the livestock treatment with providing an alternative medicine popularly known as *Meloxicam.*

Following the decline in vulture populations, the Government of Nepal has initiated *ex-situ* conservation through establishment of Vulture Conservation Breeding Centre in the Chitwan National Park in 2008. Fifty-seven White-rumped vultures are being reared in the centre. The centre aims breeding of vultures, rearing them, and eventually release to the wild in order to secure the vulture population. Similarly, seven vulture restaurants have been established at various parts of the country, where vulture nests and populations are protected with the support of local comunities, CBOs, NGOs and INGOs.

The Government of Nepal in collaboration with various conservation partners has implemented various vulture conservation activities based on the Vulture Conservation Action Plan, 2009. Bird Conservation Nepal (BCN), WWF Nepal, National Trust for Nature Conservation (NTNC), and other national and international conservation organizations including local communities supported to implement the activities.

This Vulture Conservation Action Plan (2015-19) is prepared based on the past learnings and also incorporated current conservation issues. I hope that collaborated efforts are always prominent to implement this action plan. As government efforts are not enough, this action plan will provide a platform to raise fund, generate financial and technical resources and eventually to implement the actions and materialize the objectives.

I am thankful with BCN for initiating action plan preparation work. In addition, I would like to share my sincere thanks to Hariyo Ban Program, WWF Nepal, RSPB, ZSL Nepal, NTNC and BCN for their institutional support to prepare this action plan. Finally, Dr. Maheshwar Dhakal and Mr. Khadananda Paudel deserve special thanks for their hard work to coordinate and prepare the action plan.

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ACRONYMS

Species

BV	Bearded Vulture *Gypaetus barbatus*
CV	Cinereous Vulture *Aegypius monachus*
EV	Egyptian Vulture *Neophron percnopterus*
GV	Griffon Vulture *Gyps fulvus*
HG	Himalayan Griffon *Gyps himalayensis*
IV	Indian Vulture *Gyps indicus*
RHV	Red-headed Vulture *Sarcogyps calvus*
SBV	Slender-billed Vulture *Gpys tenuirostris*
WRV	White-rumped Vulture *Gyps bengalensis*

Other Acronyms

BCN	Bird Conservation Nepal
BNHS	Bombay Natural History Society
BS	Bikram Sambat (Nepali Calendar Year)
BZMC	Buffer Zone Management Committee
CCTV	Closed-circuit Television
CF	Community Forest
CFUG	Community Forest User Group
CNP	Chitwan National Park
DDA	Department of Drug Administration
DDC	District Development Committee
DFZ	Diclofenac-free Zone
DLS	Department of Livestock Services
DNA	Deoxyribo Nucleic Acid
DNPWC	Department of National Parks and Wildlife Conservation
DoA	Department of Agriculture
DoF	Department of Forests
FECOFUN	Federation of Community Forestry Users of Nepal

HN	Himalayan Nature
ICBP	International Centre for Birds of Prey
INGO	International Non-Governmental Organization
IUCN	International Union for the Conservation of Nature
MoU	Memorandum of Understanding
MoFSC	Ministry of Forests and Soil Conservation, Nepal
NBPT	National Birds of Prey Trust
NEVLA	Nepal Para-veterinary and Livestock Association
NGO	Non-Governmental Organization
NPWCA	National Parks and Wildlife Conservation Act
NSAID	Non-steroidal Anti-inflammatory Drug
NTNC	National Trust for Nature Conservation
NVRC	Nepal Vulture Recovery Committee
WWF	World Wide Fund for Nature
RSC	Regional Steering Committee
RSPB	Royal Society for the Protection of Birds
SAVE	Saving Asia's Vultures from Extinction
VCAP	Vulture Conservation Action Plan
VCBC	Vulture Conservation and Breeding Centre
VDC	Village Development Committee
VSFS	Vulture Safe Feeding Site
VSZ	Vulture Safe Zone
WCCB	Wildlife Crime Control Bureau
WWF	World Wide Fund for Nature
ZSL	Zoological Society of London

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Flock of vultures at Maharajgunj, Kapilvastu

Photo © Manoj Paudel

EXECUTIVE SUMMARY

Vultures provide an important ecosystem service by maintaining an environment free from animal carcasses. In Hindu mythology, a vulture is said to be the carrier of God Sani (Saturn); and a vulture struggled with Ravana to stop kidnap of Sita in the Ramayan.

Nine species of vultures can be found in Nepal. Six species are resident, one species is a winter migrant, another is a passage migrant and the last is a vagrant. IUCN has categorized WRV, IV, SBV and RHV as Critically Endangered and EV as Endangered.

Vultures are highly intolerant to the NSAID diclofenac, which they were exposed to through the consumption of carcasses of recently treated livestock. The Government of Nepal banned production and use of veterinary diclofenac in 2006 and endorsed the first VCAP for Nepal (2009-13). To conserve vultures a VCBC was established in CNP in 2008 which currently has 57 WRV and seven community managed VSFS were established in Nawalparasi, Rupandehi, Dang, Kailali, Kaski and Sunsari districts between 2007 and 2013. Coupled with an extensive and intensive education programme, these conservation actions have been successful at halting decline of *Gyps* vultures in Nepal. Revision of the first VCAP is needed to bridge gaps in its implementation, consolidate ongoing conservation efforts and address current issues for the conservation of vultures in Nepal. DNPWC formed a task force to review the action plan through regional consultative workshops and national workshop followed by expert reviews.

The second VCAP is aligned with the objectives of SAVE, the RSC for vulture conservation and the NVRC. Approaches outlined in the VCAP include: advocating additional bans on NSAIDs; continual education programmes; continual monitoring of NSAID use; swapping diclofenac with meloxicam; collection of veterinarian pledges to stop using diclofenac; operation of seven vulture safe feeding sites; and maintaining and expanding VSZ. The VSZ initiative, pioneered in Nepal, has been made a SAVE priority for in-situ vulture conservation in all vulture-range countries. DFZs, also pioneered in Nepal, have been created in 46 districts. It is planned to start with initial releases into a VSZ, starting in 2016 with wild taken WRV that are not likely to breed at the VCBC.

The timing of the change in vulture population trend in western Nepal coincides with increased implementation of the ban on veterinary use of diclofenac and its replacement with the safe alternative meloxicam. Data from more recent studies show that declines throughout South Asia have slowed and possibly reversed following the banning of veterinary diclofenac; however, all populations remain small and therefore vulnerable.

Diclofenac is still offered for veterinary use in Nepal. Despite not being labeled for veterinary use, these large vials of diclofenac are being sold for exactly that purpose. Much of this diclofenac is bought at Indian markets near the border with Nepal and is being imported by many small distributors, veterinarians and livestock owners.

Photo © Tulsi Subedi

Himalayan Griffon

Currently, diclofenac misuse in Nepal is lower than India, but it still poses a threat to our vultures. Further, other NSAIDs, like Aceclofenac and Ketoprofen, are vulture-toxic and thereby also pose a threat to our vultures. Therefore, continuation of efforts to complete the removal of diclofenac and other toxic NSAIDs from the vultures' food supply are essential.

The goal of this plan is to prevent the extinction of vulture species in Nepal. The objective is to restore viable wild populations of all species of vultures through provision of safe food, maintenance of suitable habitat and captive-breeding and re-introduction. The six outputs desired are:

I. Available NSAIDs are primarily meloxicam and/or other vulture-safe compounds; with no diclofenac or other vulture-toxic compounds.
II. Wild breeding populations of WRV, SBV and RHV are increased.
III. WRV are successfully bred in captivity and released into the wild.
IV. Science based information system maintained.
V. Vulture conservation awareness among general public increased/maintained.
VI. Partnership among national and international organizations maintained.

Each output is further detailed with issues and activities. A total of Nepali rupees one hundred eleven million, one hundred twenty six thousand and four hundred has been estimated for the plan for five years. The government ownership in the form of improved budgeting for vulture conservation actions in the district line agencies and engagement of VDCs and communities are expected to improve.

Egyptian Vultures >

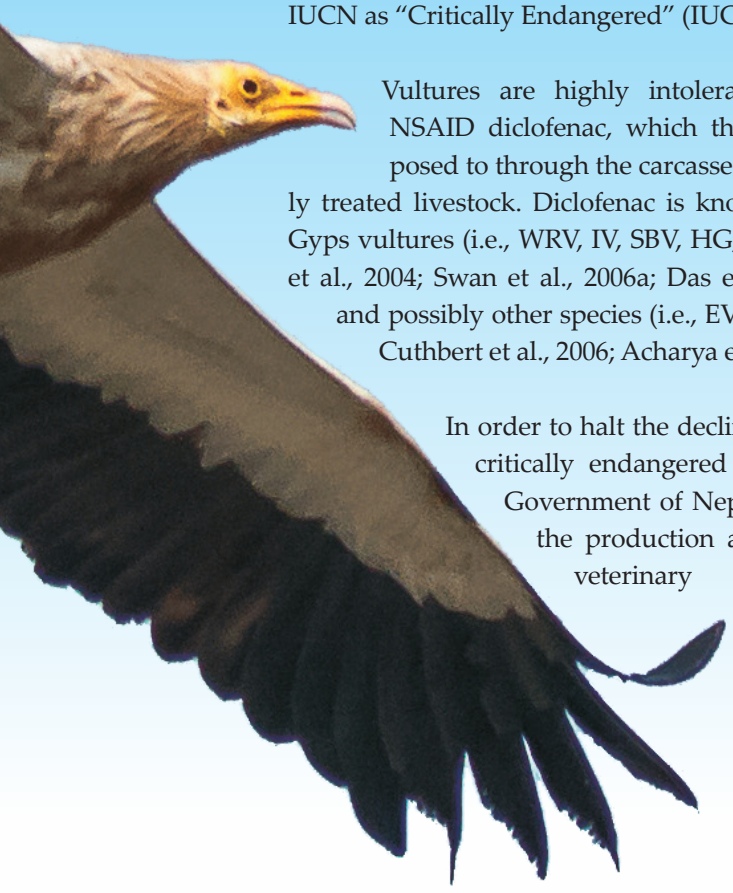
Photo © Tulsi Subedi

SECTION 1:

INTRODUCTION AND BACKGROUND

Vultures provide a vital ecosystem service. Vultures consume carcasses of both domesticated and wild animals; thereby, cleaning the environment (Thakur et al., 2012). In fact, vultures are the primary consumers of carrion in both Asia and Africa, with an individual Gyps vulture consuming around 1 kg. of tissue every three days (Mundy et al., 1992). In addition, vultures are essential for sky burials, practiced by some Asian cultures.

Four species of vultures, namely WRV, IV, SBV and RHV, are in grave danger of extinction across the Indian subcontinent. Between 1995 and 2011, monitoring of vulture populations in lowland Nepal revealed declines of 91% and 96% for WRV and SBV, respectively (Chaudhary et al., 2012). Due to similar declines elsewhere in South Asia in 1990s, these four vulture species were up listed by IUCN as "Critically Endangered" (IUCN, 2015).



Vultures are highly intolerant to the NSAID diclofenac, which they are exposed to through the carcasses of recently treated livestock. Diclofenac is known to kill Gyps vultures (i.e., WRV, IV, SBV, HG, GV; Oaks et al., 2004; Swan et al., 2006a; Das et al., 2010) and possibly other species (i.e., EV, RHV, BV; Cuthbert et al., 2006; Acharya et al., 2010).

In order to halt the decline of these critically endangered birds, the Government of Nepal banned the production and use of veterinary diclofenac in 2006 and endorsed the first VCAP for Nepal (2009-13). The main objective of VCAP was to prevent the extinction of vulture by ensuring a safe food supply, maintaining suitable habitat, captive-breeding for re-introduction, and better understanding the ecological importance of these birds in Nepal.

VCBC was established at CNP in 2008 by DNPWC, with support from NTNC, BCN, RSPB and ZSL (GoN/MoFSC, 2014). In addition, BCN, RSPB and HN established seven community managed VSFS in Nawalparasi, Rupandehi, Dang, Kailali, Kaski and Sunsari districts between 2007-2013 (Paudel, 2013; Himalayan Nature, 2015).

Review of the progress made in implementation of the first VCAP indicates that it was successful in achieving its goal of halting the dramatic decline of Gyps vultures in Nepal. More specifically, conservation actions have stabilize the population of WRV (Prakash et al., 2012). However, revision of VCAP was needed to bridge gaps in the implementation of the previous VCAP, consolidate ongoing conservation efforts and address current issues for the conservation of vultures in Nepal.

VCAP revision process and methods

In order to revise the VCAP, a task force was formed in 2014 and three regional consultative workshops were organized at Nepalgunj, Sauraha and Inaruwa. In addition, a national workshop was organized at Lalitpur to share and get feedback on the draft of VCAP. The draft was then shared with experts for review before finalizing the VCAP.

1.1 TAXONOMY

Nine species of vultures are found in Asia and all have been recorded in Nepal (Table 1.1). All are representatives of the Old World Vultures which are placed within the family *Accipitridae* and order *Accipitriformes* (BirdLife International, 2014).

1.2 DISTRIBUTION

The distribution of BV, CV, EV and GV extend beyond South Asia into Central Asia, Europe and Africa. HG is distributed in South and Central Asia. RHV, SBV and WRV are distributed in South and South East Asia. IV is only found in South Asia.

Six species are resident, two species are migrants and one species is a vagrant (Table 1).

Five species are currently considered globally threatened; and seven species are considered nationally threatened (Table 1).

All species, except BV, inhabit the lowlands of Nepal; whereas, all species, except IV, inhabit the mid-hills. All species, except IV, RHV, SBV and WRV, inhabit the himalayas.

1.3 ECOLOGY AND BREEDING BIOLOGY

Vultures are obligate scavengers. They inhibit in areas near human habitation and open areas (Grimmett et al., 2000; Prakash et al., 2003). In Nepal, they mostly rely on carcasses of domesticated animals as a food source. The particular characteristic feature of vulture is that most of them have bald head, devoid of feathers and have keen eyesight. The bald head and neck is unique because a feathered head would become spattered with blood and other fluids and thus will be difficult to keep clean.

Nesting colonies of WRV are distributed in Kapilvastu, Dang, Nawalparasi, Rupandehi, Kailali, Kanchanpur, Palpa, Syangja, Kaski, Arghakhanchi and Sunsari districts (Chaudhary et al., 2012; Paudel, 2013; Baral et al., 2013; Bhusal, 2011, Baral et al., 2004).

The breeding activities of WRV started in September, SBV in October and EV in February (Baral et al., 2007; Bhusal, 2011; BCN, unpublished). The average breeding success for WRV in western lowland of Nepal was 64% (BCN, unpublished).

TABLE 1. Resident/migrant status, conservation status and estimated population of nine species of vulture in Nepal

Species*	Resident/ Migratory*	Conservation Status (Global)+	Conservation Status (Nepal)#	Estimated population in Nepal#
BV	Resident breeder	Near Threatened	Vulnerable	<500
CV	Winter migrant	Near Threatened	Endangered	-
EV	Resident breeder	Endangered	Vulnerable	<1000
GV	Passage migrant	Least Concern	Least Concern	-
HG	Resident breeder	Near Threatened	Vulnerable	<10000
IV	Vagrant	Critically Endangered	Not specified	-
RHV	Resident breeder	Critically Endangered	Critically Endangered	<500
SBV	Resident breeder	Critically Endangered	Critically Endangered	<50
WRV	Resident breeder	Critically Endangered	Critically Endangered	<2000

(Source: *DNPWC/MoFSC/GoN 2009; +IUCN 2014; #BCN and DNPWC 2011)

1.4 STATUS AND TRENDS

Historically, the WRV was the most common vulture in the lowlands of Nepal (Fleming et al., 1984). The population of WRV in Koshi Tappu decreased by 85.3% between 2000 and 2003 (Baral et al., 2004). Nationwide road transect surveys in the lowlands of Nepal between 1995 and 2011 showed 91% and 96% declines in populations of WRV and SBV, respectively (Chaudhary et al., 2012). Populations of BV and HG in Upper Mustang declined by 80% (2002-2008; Acharya et al. 2010) and 70% (2002-2005; Acharya et al. 2009), respectively. Anecdotal evidence suggests that all other species of vulture have declined in Nepal as well.

In India, there was a 99.9% decline in the population of WRV and a 96.8% decline of SBV and IV combined between 1992 and 2007 (Prakash et al., 2007). Similar declines of WRV and IV have been observed in Pakistan and Bangladesh (Gilbert et al., 2007; Khan, 2013). Between 1991 and 2003, there was 80% decline in EV and 91% decline in RHV in and near protected areas in India (Cuthbert et al., 2006).

All declines coincide with the peak in veterinary diclofenac use in South Asia.

Data from more recent studies show that declines throughout South Asia have slowed and possibly reversed following the banning of veterinary diclofenac (Chaudhary et al. 2012; Prakash et al., 2012; Galligan et al., 2014; Paudel et al., in review); however, all populations remain small and therefore vulnerable (Figure 1).

1.5 ASSESSMENT OF THREATS

Risk of continued use of diclofenac

All species of Gyps vultures tested so far are highly sensitive to diclofenac (Oaks et al., 2004; Swan et al., 2006a, Das et al., 2010). Diclofenac was commonly used to treat a variety of ailments in domesticated ungulates in South Asia during the 1990s and early 2000s. In 2006 Nepal, India and Pakistan banned the production and use of veterinary diclofenac.

The timing of the positive change in the WRV population trend in the western lowlands coincides with increased implementation of the ban on veterinary use of diclofenac and replacement with the vulture-safe alternative NSAID meloxicam (2006-2008; Prakash et al., 2012).

Diclofenac was not found in any of the 300 veterinary pharmacies during formal surveys in 2012

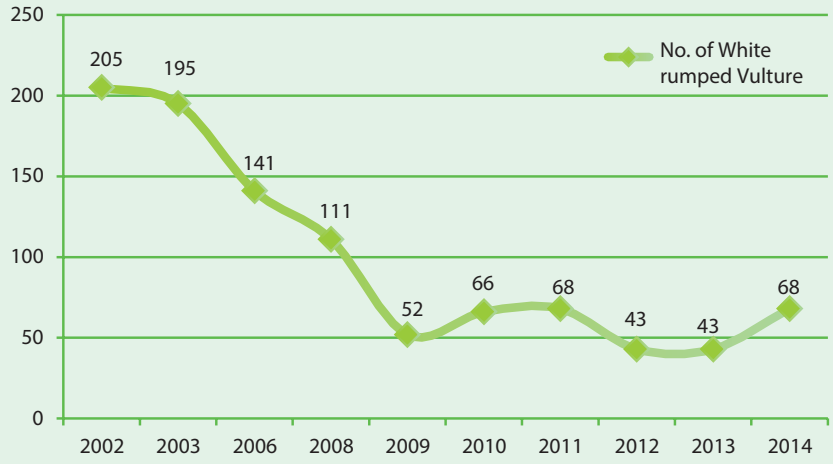


FIGURE 1. Population trend in WRV monitored through road count survey in the western lowlands between 2002 and 2014. The ban on diclofenac occurred in 2006.

(Source: Chaudhary et al., 2012 and Bird Conservation Nepal, unpublished).

and 2013 (BCN, unpublished). However, diclofenac was offered in two settlements during undercover surveys which involved 84 veterinary pharmacies in 84 settlements of 25 districts in 2012 and 2013 (BCN, unpublished). These products were not labeled for veterinary use.

Similarly in India, the partial effectiveness of the ban on veterinary use of diclofenac is the most likely main cause of the slowing of the vulture decline. In India, diclofenac is still being produced in large vials adequate for dosing large domesticated ungulates. Despite not being labeled for veterinary use, these large vials are being sold for veterinary use. It is these same products that are making their way into Nepal.

However, current diclofenac misusage in Nepal is lower than in other areas of South Asia (SAVE, unpublished data). Rather, undercover surveys found that meloxicam was the most numerous NSAID offered (BCN, unpublished data). Continuation of efforts to complete the removal of diclofenac and other toxic NSAIDs from the vultures' food supply are essential.

Effect of other NSAIDs

Meloxicam is a safe alternative for diclofenac (Swan et al., 2006b). In comparison to diclofenac, meloxicam is much less toxic to *Gyps* species of vulture, as well as a wide range of avian species, at recommended clinical dose levels that has been approved for human use in more than 80 countries (Ghosh et al., 2004; Montoya et al., 2004 in Swan et al., 2006b). Meloxicam is licensed and widely used as a veterinary drug in Nepal, India, Europe and North America (Dumka and Srivastava, 2004; Livingston, 2000 in Swan et al., 2006b).

Ketoprofen is toxic to Cape Griffon Vultures *Gyps coprotheres* and African White-backed Vultures *Gyps africanus* at doses that birds could encounter in the wild if they fed upon carcasses of cattle that died within hours of treatment (Naidoo et al., 2009).

The use of Aceclofenac as a veterinary NSAID for treating livestock in South Asia, poses a high risk of toxicity to vultures scavenging because it is thought to metabolize into diclofenac in domesticated ungulates (Sharma, 2012).

There are approximately eight more NSAIDs currently available in South Asia; none of which have been safety tested on vultures and thereby are potentially toxic to vultures. One of these, nimesulide, is the second most commonly offered NSAID in Nepal after Meloxicam (BCN unpublished data).

Knowledge base

A number of studies have been carried out to understand vultures, their biology and population dynamics in Nepal and South Asia such as: Baral et al., 2004; Acharya et al., 2009; Acharya et al., 2010; Chaudhary et al., 2012; Prakash et al., 2012; Baral et al., 2013; and Paudel et al., in review. However, much more studies and research needs to be carried out to increase our knowledge base on vultures for effective conservation.

1.6 SOCIO-CULTURAL ASPECTS

Vulture have an important role in some cultures living in Nepal that believe in sky burials. These cultures require vultures to consume of human corpses. Among people in Mustang and in other cultures including the Sherpa, based on priest advice the dead body is cut in to pieces and offered to vulture. In this dry environment, where burial and incineration are impossible, vultures are the cleaner of the environment. The earlier a vulture eats a body, reflects the religiousness of that person. In Hindu mythology, vulture are said to be the carrier of God Sani (Saturn). In Ramayan, the vulture fights with Ravana to rescue of Sita. However, in other Nepali communities, vultures are regarded as bearers of ill luck and their presence and sighting are associated with death. This belief is an obstacle in securing the confidence of the community in vulture conservation.

1.7 NATIONAL AND REGIONAL MEETINGS

1.7.1 Regional Meetings

a. SAVE meetings

These meetings bring together experts from NGOs, INGOs and Government to discuss and focus vulture conservation actions across South Asia.

The inauguration of SAVE was conducted at Kathmandu, Nepal, and New Delhi, India, on 21 February, 2011. First meeting of SAVE was conducted at Pinjore, Haryana, India on 17-18 November 2011. Second meeting of SAVE was conducted at Kathmandu, Nepal on 5-6 November 2012. Third meeting of SAVE was conducted in Alipurduar and Buxa Tiger Reserve, West Bengal, India on 7-9 November 2013. Fourth meeting of SAVE was conducted in Dhaka, Bangladesh on 20-23 November, 2014. Annual meetings are planned for the future.

From discussions in the third and fourth meetings, SAVE produced "A Blueprint for the Recovery of South Asia's Critically Endangered Gyps Vultures" with priority actions and corresponding timelines set out (ANNEX-III).

The following list of priorities has been adopted as updated SAVE priorities for vulture conservation in 2014:

1. An immediate ban of diclofenac manufactured for human medicine in vials or ampoules larger than 3ml.
2. An effective system of regulation of veterinary drugs, based upon safety-testing on vultures (protocol already agreed for India) initiated and underway for all current painkillers (NSAIDs) and for all potential new ones entering veterinary practice.
3. Improve the availability of more effective meloxicam formulations thereby facilitating take up by veterinary practitioners.
4. Veterinary licenses to be withdrawn for two drugs – ketoprofen and aceclofenac - based on the good existing evidence that they are unsafe for vultures.
5. Major efforts urgently needed within South Asia to address the immediate and increasing gap in funding for vulture conservation which now jeopardises the programme.
6. Promotion of network and approach of 'Vulture Safe Zones' across South Asia with expansion to include trans-boundary cooperative efforts.
7. Maintain and support the existing vulture conservation breeding programmes throughout South Asia.
8. Prepare for first soft releases of captive bred vultures in India by 2016.
9. Link SAVE activities and meetings to closely support the 'Regional Steering Committee' in order to facilitate the urgent implementation of the 2012 Delhi Regional Agreement.

b. Constitution of the RSC

The RSC was constituted on 24 September 2012 with India as first Chair on two-year rotational basis. The other countries of the national committee are Bangladesh, Nepal, and Pakistan, one representative from one leading NGO in each country (preferably a SAVE member), one senior representative from IUCN (Co-chair), Chair of the SSC vulture specialist group, one representative from an INGO (to be nominated by Birdlife), one representative from Central Zoo Authority India, one representative from the Wildlife Institute of India, one representative from an UN agency facilitating the developing the Global Environmental Facility proposals.

In February 2014, the RSC accepted the "A Blueprint for the Recovery of South Asia's Critically Endangered Gyps Vultures" as the regional action plan for vulture conservation.

In April 2014, the RSC meet for a second time in Delhi, India. A third RSC meeting is planned for 2015 to be Chaired by Nepal.

c. Formation of NVRC

NVRC has been formed to facilitate the smooth implementation of VCAP and foster the regional and global collaboration in saving the Asian vultures. NVRC is comprised is thirteen members:

1. Chairperson- Director General, DNPWC
2. Member-Deputy Director General, DNPWC
3. Member-Deputy Director General, DoF
4. Member-Deputy Director General, DoA
5. Member-Deputy Director General, DLS
6. Member- Deputy Director General, DDA
7. Member- Country Representative, IUCN-Nepal
8. Member- Programme Manager, IUCN- Nepal
9. Member- Conservation Biologist, WWF Nepal
10. Member- Executive Officer, NTNC
11. Member- Chief Executive Officer, BCN
12. Member- Technical Advisor, HN
13. Member Secretary- Under Secretary, DNPWC

d. Trans-boundary VSZ meeting in India

BCN shared experience of establishing and managing VSZ in Nepal in workshop organized by BNHS in Uttar Pradesh, India, early in August 2011. SAVE partners in India are now working on establishing VSZ in Uttar Pradesh. In June 2012, members from both the India and Pakistan VSZ teams visited Nepal to observe activities in the VSZ.

1.7.2 National Meetings

a. National level DFZ guideline workshop

Late June 2011, a workshop jointly organized by DNPWC and BCN convened people from conservation and veterinary sector to collect feedback and finalize the draft guideline of DFZ declaration and management.

b. Five year MoU signed for VCBC

A tripartite MoU among DNPWC, BCN and NTNC was signed for construction of new colony aviary and overall management of VCBC at Kasara, CNP, in August 2011. In addition, the parties agreed to meet the challenges of captive management of Gyps vulture species and creation of a VSZ though a partnership approach. This will be characterized by equal and robust collaboration, especially through the sharing of information and ideas and in the relationship with other stakeholders.

- The partnership will follow the programme proposal and VCAP.
- The partnership will be enacted through the formation of a steering committee, consisting of one representative from each partner organizations. Designated officer at DNPWC will chair; and convene the meeting every six months or as deemed necessary.
- External individuals or organizations that wish to contribute to the recovery programme will be invited by consent of all parties.
- Monitoring and evaluation of the programme will be carried out by a team consisting of each partner's representatives.
- DNPWC, in collaboration with NTNC and BCN, shall execute the projects.
- The partnership will follow recommendations of the South Asia Vulture Recovery Plan and successful actions by partners from India and Pakistan implementing these recommendations.
- Partnership with the Department of Livestock Services, Department of Drug Administration, Department of Forests and other necessary partners will develop to facilitate the cessation of diclofenac, ketoprofen and other non-tested NSAIDs for veterinary purposes and to promote the meloxicam as a safe alternative.
- SAVE, RSPB, ZSL and other external organizations will be requested to provide necessary technical and financial support.

1.8 EX-SITU CONSERVATION & RELEASES

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 of wild populations and urgent need to establish breeding centres, VCBC were established by the BNHS and Haryana Forest Department first at Pinjore, Haryana State, India. This program was launched with the financial and technical support from RSPB, ZSL and NBPT. Two further centres were established on a similar basis in West Bengal and Assam. Five additional centres are at different stages of development initiated by Central Zoo Authority of India (Indian Government) (Bowden, 2015). VCBC has also been established in Pakistan initiated with 11 birds. (Bowden et al., 2012).

The DNPWC in collaboration with NTNC, BCN, RSPB, and ZSL has established a VCBC at Chitwan, Nepal in 2008. Although it was aimed to conserve two species, difficulties in locating nests of SBV has caused VCBC to focus on the WRV. The center in Kasara covers an area of 6,375 square meters adjacent to the Gharial Breeding Center. The plan for the centre is to release birds, which is anticipated to lead to the restoration of a wild population of around 100 pairs after 16 or more years in a diclofenac-free environment (DNPWC/MoFSC/GON, 2009). It is planned to start with initial releases into a VSZ, starting in 2016 with wild taken WRV that are not likely to breed at the VCBC.

Currently the centre at Kasara has 57 vultures kept in two colony aviaries. All were brought as juveniles captured from western regions of Nepal. After they reached sub-adult stage, they were transferred to large colony aviaries from holding aviaries. The colony aviaries are facilitated to mimic natural habitats, with ponds where they can take baths, perches that mimic tree branches, hammocks where they can make nests and lay eggs, shades where they can escape from scorching heat, and120 meters aviary length where they can fly freely from one end to another.

The health condition of vultures kept in captivity is one of the important aspects which should be ensured at the Kasara centre for success in breeding. Prompt action through isolation and treatment of sick birds is required in order to prevent disease in such birds and prevent it from spreading to others. The regular capture and health checkup of each bird helps monitor the status of individuals as they age. The parasitic load evaluation from fecal examination 4-5 times a year helps to monitor the status of parasitic infestations occurring in a whole year. The carcasses provided to them for feeding are confirmed diclofenac-free as well as disease free, which requires health checkups and an observation period of at least one week before slaughter.

Breeding in vultures is a time consuming and tedious activity. It takes five years for vultures to reach breeding age, and they lay just one egg in a year. Also, the bird naturally adapted to breed and nest on tall trees. Providing this habitat in a captive setting is one of the major challenges and time consuming efforts to the centre. Historical evidence suggests that these types of centers in foreign countries like India were successful only after many years of efforts.

Vultures are highly sensitive to disturbances, and stress more easily than any other species in captivity. Vultures trying to escape disturbances become exhausted and stressed. Stressed birds are prone to illness. During breeding season it is also likely

that disturbances will cause breeding failure - nest as well as egg abandonment. As vultures at VCBC are kept in a confined area in large numbers, and even a single bird is precious to save the species from becoming extinct, then center is not able to allow visitors for observation at aviaries.

1.9 IN-SITU CONSERVATION

Since 2006, different integrated approach to conserve vultures in Nepal has been implemented for the in-situ conservation of vultures which involves advocacy, sensitization, monitoring the use of NSAIDs, swapping diclofenac with meloxicam, the collection of veterinarian pledges to stop using diclofenac and the operation of VSFS.

Seven VSFS are in operation in Nepal where safe food is provided to vultures, income generation activities are developed with communities and vultures, their plight and our actions are showcased. These VSFS collect old and unproductive cows from the nearby villages and keep them at least for seven days to ensure diclofenac free and fed to vultures after their natural death. Diclofenac monitoring and swapping for safe alternative-meloxicam, monitoring of other Non-tested NSAIDs, nest monitoring, community sensitizations and outreach are key elements of any vulture conservation. Regular monitoring of veterinarians and domesticated ungulate carcasses has been carried out to determine the uptake of meloxicam and other NSAIDs in Nepal.

To advocate enforcement of diclofenac ban and maintain a captive population of vultures, BCN initiated a pioneer idea of working with local communities to establish a VSZ since 2009 (Paudel et al., 2013). A VSZ is an area surrounding one or more wild vulture nesting colonies, large enough to encompass the mean foraging range (>30,000km^2), and completely free from diclofenac. Provisional VSZ in the western lowlands of Nepal extends from the Chitwan National Park to the western border with India. Within this area 30 nesting colonies of vulture are protected through advocating conservation at the district and community level. A network of 20 local conservation groups has been established through this area to regularly advocate vulture conservation and to monitor breeding colonies. The VSZ initiative has been made a SAVE priority for in-situ vulture conservation in all range countries. Further, captive bred vultures will be released in to VSZs.

Also, DFZs have been created in different districts of Nepal. The districts are declared as DFZ after monitoring the diclofenac in veterinary pharmacies and where the absence of diclofenac in the district was confirmed through the monitoring. 46 districts have been declared as DFZ under the stewardship of district level government agencies and leadership of District Livestock Service Office. This was coordinated by BCN and its local partners. These Veterinary Diclofenac Free districts cover a total area of 101, 160 km^2 (Details in Annex-II) (BCN, unpublished).

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 diclofenac was previously (BCN, unpublished).

Multidose vials of human intended diclofenac have been used in veterinary practice in Nepal. A pharmaceuticals in Nepal, National Healthcare Private Limited located at Birgunj, Nepal, has discontinued the production and sale of multidose human diclofenac (30 ml.) after a request by BCN and SAVE to do so. In recent years, diclofenac are easily available in Indian markets nearby Nepal boarder areas and are being imported for veterinary use which is a big challenge. (BCN, unpublished).

1.10 POLICY AND LAW

Policy and law related to the forest, national parks, livestock, drug administration were reviewed to find linkage with vulture conservation.

1.10.1 Forest Act 1993 (2049 BS) with first amendment 1999 (2055 BS)

- Birds, other wildlife and trophies are included under the definition of "Forest Products".
- Includes the provision of National Forest and Private Forest; National Forest has been categorized into: "Government Managed Forest", "Protected Forest", "Community Forest", "Leasehold Forest" and "Religious Forest".
- Some of the prohibited actions within the National Forest are:
  - To deforest, plough, dig or cultivate in the land of Forest Area and to construct house or hut.
  - To set fire or to do any act to cause firing.
  - To remove, traffic or sell and distribute Forest Products from the Forest Area.
  - To cut trees or plants or their branches, extract rosin or bark or to damage in any way.
  - To damage any other Forest Products by negligence while cutting, felling dragging or removing trees from the Forest Area under the license.
  - To extract boulders, pebbles, sand or soil, burn charcoal or lime or manufacture other finished products from them or collect them.
  - To damage Forest Products by contravening the terms of the permit in the case the permit is received to take the Forest products.
  - To hunt

1.10.2 NPWCA 1973 (2029 BS) with fourth amendment 1992 (2049 BS)

- Includes the provision of "National Park", "Strict Nature Reserve", "Wildlife Reserve", "Hunting Reserve", "Reserve", "Conservation Area" and Buffer Zone.
- Some of prohibited actions within national park or reserve are:-
  - To hunt wildlife.
  - To cut, clear, fell, remove or block trees, plants, bushes or any other forest resources, or do anything to cause any forest resources dry, or set it on fire, or otherwise harm or damage it.
  - To cause damage to forest resources or wildlife or birds or any land.
  - To take any domestic or any other kind of animal or trophy by persons other than government employees on deputation or visitors of the public paths within the national park or reserve.
  - To block, divert any river or stream flowing through national park or reserve, or any other source of water, or use any harmful or explosive materials therein.

1.10.3 Buffer Zone Management Regulation, 1996

- Conservation in Buffer Zone: The warden shall have the responsibility to do or get the following conservation works done in the buffer zones: (a) wildlife, (b) natural environment and natural resources, (c) bio-diversity, (d) forests, (e) development works.
- Some of the prohibited actions within the Buffer Zone are:
  - Occupy any land without legal ownership or cut trees, clear forests or cultivate forestland.
  - Any activities damaging forest resources or to set fire in the forests.
  - Use of any harmful poison or explosive substances into the river, stream or source of water flowing in the buffer zone.
  - Hunting illegally and any acts damaging to wildlife.

1.10.4 Drug Act 1978 (2035 BS)

- The letter of recommendation for export and import of drugs need to obtain from the DDA.
- Registration of name for the sale and distribution of drugs by owner or firm in the DDA is needed.
- Prohibition of misuse or abuse of drugs.
- The Inspector may enquire and inspect any place, wherein any drug is being manufactured, sold, distributed or transported for any drug if suspected to be not safe for the

Red-headed Vulture

use of the people, efficacious and of standard quality or has reasonable grounds to believe that an offence has been committed or is being committed in contravention of Act and Regulation. Inspector can send the sample for testing.

- Government may, prohibit the manufacture, sale, distribution, storage, transportation or export, import of the drugs if deemed necessary.
- Offence contrary to the provision in this act shall be punished with imprisonment up to three years or fine up to Rs.5000 or with both.

1.10.5 National Drug Policy -1995

Quality assurance and regulatory control measures:

- National Medicines Laboratory will be developed as an independent National Quality Control Laboratory.
- Drug registration will be based on scientific facts. The manufacture, import, sale and distribution of ineffective, harmful, toxic as well as irrationally combined formulations will be banned.
- GoN will develop "Drug Information System" to disseminate the relevant information about proper use of drug, adverse reaction, pharmacology, toxicity, standard and efficacy.
- NGOs will also be encouraged to participate in providing information about rational use of drugs to the public.
- Prevailing antibiotics used in food products, animal feeds and agriculture substances will be managed properly.
- Supervision and monitoring on use of antibiotics will be carried out. Misuse will be controlled and proper recording system will be developed.

Photo © Bird Conservation Nepal

- Antibiotic will be classified into different groups for prescribing purposes by Medical Doctors, Veterinary Doctors and other health personnel.
- GoN will constitute a national antibiotic control committee comprising of experts from human and animal health, agriculture and representation from professional organizations/councils and organizations involved in consumers right and other sectors for prudent use of antibiotic.
- GoN will constitute a national antibiotics therapeutics advisory committee comprising of experts from relevant sectors to advice a prudent use of antibiotics.

1.10.6 Animal Health and Livestock Services Act, 1999 (2055 BS)

- "Animal" is defined to include wild animal including bird.
- Government may appointment Veterinary Inspector to inspect the quality and standard of veterinary drugs or biological products.

1.10.7 Animal Health and Livestock Service Regulation 1999 (2056 BS)

- Veterinary inspector has authority to examine the livestock medicine, he can collect sample to check and sent to DLS and verify whether the sale is done by the person with authority.

Slender-billed Vulture

Photo © Jyotendra Jyu Thakuri/BCN

SECTION 2:

OBJECTIVES AND ACTION PLAN

2.1 GOAL

To prevent the extinction of vulture in Nepal.

2.2 OBJECTIVE

Restore viable wild populations of all species of vultures through provision of safe food, maintenance of suitable habitat and captive-breeding and re-introduction.

2.3 OUTPUTS

I. Available NSAIDs are primarily meloxicam and/or other vulture-safe compounds; with no diclofenac or other vulture-toxic compounds.
II. Wild breeding populations of WRV, SBV and RHV are increased.
III. WRV are successfully bred in captivity and released into the wild.
IV. Science based information system maintained.
V. Vulture conservation awareness among general public increased/maintained.
VI. Partnership among national and international organizations maintained.

Photo © Khadananda Paudel/BCN

Photo © Krishna Bhusal/BCN

2.4 OUTPUTS, ISSUES AND ACTIVITIES

Outputs	Issues	Activities
1. Available NSAIDs are primarily meloxicam and/or other vulture-safe compounds; with no diclofenac or other vulture-toxic compounds.	• Despite the ban, diclofenac can still be found in veterinary pharmacies; particularly in the eastern lowlands. • This diclofenac is not labelled for veterinary use but is in multi-dose vials suitable for dosing livestock; it is all manufactured in India. • Many Nepali livestock-owners that live close to India import small quantities of this diclofenac. • Aceclofenac metabolises into diclofenac in livestock, but is not banned in Nepal. • Ketoprofen kills vultures, but is not banned in Nepal. • No regulatory mechanism exists to ban NSAIDs shown to be vulture-toxic. • Meloxicam is the only known vulture-safe NSAID, but there are more than eight untested, and thereby potentially vulture-toxic, NSAIDs available in South Asia. • Meloxicam holds a large share of the veterinary NSAID market, but untested NSAIDs like nimesulide hold large shares as well. • Low quality meloxicam formulations are widely available which means uptake by vets is lower.	i) Advocate a ban on multi-dose vials of diclofenac. ii) Advocate a ban on veterinary and multi-dose vials of aceclofenac. iii) Advocate a ban on veterinary and multi-dose vials of ketoprofen. iv) Advocate a regulatory mechanism to ban other NSAIDs shown to be vulture-toxic. v) Enforce present ban on diclofenac and future bans. vi) Enforce prescription-only and recorded sales of NSAIDs. vii) Engage WCCB and police to stop importation of multi-dose vials of diclofenac. viii) Engage agencies and organisations working in Nepal-India border area to remove multi-dose vials of diclofenac. ix) Continue to raise awareness of the vulture-toxic and vulture-safe NSAIDs. x) Provide monetary incentives to use meloxicam (ie remove taxes, subsidise, etc.). xi) Promote good quality meloxicam (ie neutral pH and 20 mg/ml). xii) Promote other NSAIDs shown to be vulture-safe and of good quality (if identified).
2. Wild breedign populations of WRV, SBV and RHV are increased.	• Throughout South Asia, population declines have slowed, stabilised or reversed in many species; but most populations are small. • WRV have stabilised but not recovered. SBV and RHV remain scarce. • Vultures are almost absent from the eastern lowlands. Small populations are vulnerable to additional threats (eg incidental poisoning, electrocution, nest disturbance). • Many livestock carcasses are now buried, rather than left in the open for vultures. • In some areas, suitable nesting trees are lost to logging. • Vultures are not protected under the National Parks and Wildlife Conservation Act 1973. • Support from the government and civil society is limited and confined to small areas where vulture numbers are increasing.	i) Conduct post mortem examination of all dead vultures found. ii) Advocate a ban on carcass poisoning; and dog control measures. iii) Raise awareness about incidental poisoning in areas where it occurs. iv) Employ mitigation measures to prevent electrocution in areas where it occurs. v) Engage and support communities in nesting site and tree protection. vi) Advocate leaving livestock where they fall for vultures or informal feeding sites. vii) Amend the conflicting acts and regulations to facilitate vulture conservation. viii) Include RHV, SBV and WRV in the list of protected bird. ix) Secure long-term funding and sustainable practice for in-situ activities.

Outputs	Issues	Activities
3. WRV are successfully bred in captivity and released into the wild.	• The captive population of WRV are only now maturing. • There have been a few attempts at breeding (e.g., nest building, mating, egg laying); and fewer have been successful (i.e. chick raised). • The sexes of the captive population are unknown; the sex ratio within aviaries may be negatively affecting breeding. • Sexes can only be determined genetically. • The captive population is vulnerable to disease outbreaks (e.g. avian influenza). • A reintroduction plan has not been developed. • Necessary buildings and infrastructure for reintroduction have not been constructed. • The prevalence of diclofenac in vulture food supply where captive vultures will be released is unknown. • How captive vultures will adapt to the wild is unknown. • Captive breeding and reintroduction programmes are expensive. • The necessary expertise and workforce for both programmes is incomplete.	i) Continue the captive breeding programme. ii) Continue bio-security, regular health screening and veterinary care at VCBC. iii) Ensure legal dispensation to ensure captive population is not culled during a outbreak. iv) Determine sexes of the captive population using genetic techniques. v) Plan the reintroduction programme. vi) Develop trans-boundary cooperative with Indian agencies and organisations to extend VSZ conservation actions into India to ensure for 100km radius VSZ from identified release sites in Nepal. vii) Construct necessary building and infrastructure for reintroductions. viii) Balance sex ratio in aviaries and use unbalanced sex to trial reintroduction methods. ix) Determine the prevalence of diclofenac in vulture food and the adaption of released vultures into the wild using remote tracking techniques in both wild and captive WRV. x) Create Emergency Fund for crisis management including disease outbreaks. xi) Secure long-term funding for ex-situ activities. xii) Building expertise and workforce for both programmes.
4. Science based information system maintained.	• Conservation actions need to be based on evidence; and evaluated and adapted through monitoring. • Knowledge of vulture biology and ecology is limited. • Expertise in data collection, analysis and interpretation are limited. • Not all data is stored securely. • The findings from research and monitoring are not always disseminated widely.	i) Monitor vulture populations using road transect surveys. ii) Monitor vulture population breeding success using nesting site surveys. iii) Monitor NSAID availability in veterinary pharmacies through open and undercover surveys. ii) Monitor NSAID prevalence in livestock and vulture carcasses. iii) Expand knowledge on vulture biology and ecology. iv) Expand expertise in field, lab and desk based science. v) Assemble and maintain a central database. vi) Produce reports, articles and other media for dissemination among a varied audience.

Outputs	Issues	Activities
5. Vulture conservation awareness among general public increased.	• Many NSAID-users are unaware of the diclofenac-problem and the meloxicam-solution. • Many people living with vultures have a negative attitude towards vultures; and do not appreciate the ecosystem service vultures provide. • Many communities want to support vulture conservation, but need coordination and funds.	i) Continue to raise awareness of the diclofenac-problem and the meloxicam-solution.
		ii) Continue to raise awareness of vultures and the ecosystem service they provide.
		iii) Maintain VSFS and informal feeding sites in the western lowlands.
		iv) Expand DFZ and VSZ initiatives into the eastern lowlands.
		v) Establish Vulture Stewardship initiative at important nesting sites in the western and eastern lowlands.
		vi) Establish information centres at all VSFS, informal feeding sites and Vulture Stewardship Sites.
		vii) Advocate the integration of vulture conservation into community forest management.
		viii) Provide necessary knowledge, skills and materials for vulture conservation to individuals and communities contributing to vulture conservation.
		ix) Recognize and reward communities and individuals for their effort in vulture conservation.
		x) Allow the transfer of knowledge between engaged individuals and communities through meetings, site visits and dissemination in the media.
6. Partnership among national and international organizations maintained.	• Vulture conservation is poorly funded by the Government of Nepal. • Vulture conservation is largely funded by INGOs. • Vulture and conservation expertises are limited in Nepal. • Many wild vultures breeding or bred in Nepal forage in India.	i) Secure 5% of the government budget under Conservation specifically for vulture conservation.
		ii) Maintain good relationships with INGOs that provide funds and/or expertise through meeting objectives and timely reporting.
		iii) Partner with national, regional and/or international organisations to secure big funds; particularly, Indian partners working within 100km from potential release sites in Nepal.
		iv) Participate in national, regional and international meetings and workshops to build networks and expertise.

A flock of vultures at Malparawa, Kapilvastu

Photo © Manoj Paudel

2.5 INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION STRATEGY

2.5.1 The Role of NVRC

The key supporting role will have to be played by the NVRC to the full implementation of the VCAP, as it consists of all the implementing, regulating and supporting institutions.

The terms of reference of the NVRC are:

- Facilitation in the implementation of the VCAP (2009-2013) and to review and prepare a new VCAP.
- Support, facilitate and identify priority research, conservation, recovery and monitoring projects and seek financial and technical support for the implementation.
- Collaborate and coordinate for multi-stakeholders engagement, including private sector.
- Promote conservation education, awareness, communication, capacity building and exposure visits highlighting the importance and urgency of ex-situ and in-situ vulture conservation efforts.
- Take action 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.
- Take actions for the implementation of recommendations from the SAVE and regional meetings in the national level.
- Identify opportunities to enhance regional coordination and cooperation, including for example the harmonization of relevant policies and legislation; create a trans-boundary relation and share lessons learning.
- Facilitate and coordinate with DLS to support and monitor the carcass sample collection to conduct NSAID test.
- Facilitate and coordinate with DDA and DLS to enforce complete ban on diclofenac and other non-tested NSAIDs for veterinary use secured and alternative safe NSAIDs (including meloxicam) to be promoted within Nepal.
- Facilitate and coordinate with DoA to monitor the use of agro-chemicals impacting the vultures and raise awareness among the farmers to be part of the ecosystem management and conservation activities.
- Prepare and submit bi-annual progress reports to the Regional Secretariat, and present an update on the Nepal's progress with vulture conservation at the Regional Steering meetings.

2.5.2 Role of Government Institutions

DNPWC

Take a lead role in coordinating the overall implementation of the VCAP starting with organizing the NVRC meeting regularly. The key role are to support, facilitate and identify priority research, conservation, recovery and monitoring projects and seek financial and technical support for the implementation and work as mentioned in the national vulture recovery committee.

DDA

- To regulate the ban of the diclofenac and facilitate the use of alternative NSAIDs.
- To regulate the import/illegal use and or ban of non-tested NSAIDs.
- Support the enforcement of ban on diclofenac and other non-tested NSAIDs for veterinary use and help promote alternative safe NSAIDs (including meloxicam) in Nepal.

DLS

- Help enhance the capacity of technical manpower all over the country including the vulture habitat and legal authority they possess.
- Awareness of para veterinarians, investigation of the causes of mass mortality, preparedness plan of Avian Influenza.
- Enforce of ban on diclofenac and other non-tested NSAIDs for veterinary use and promote alternative safe NSAIDs (including Meloxicam) in Nepal.
- Regulate the use of human multi-vial doses of diclofenac use in livestock.

- Facilitate and coordinate with District Livestock Service Offices to support and monitor the carcass sample collection to conduct NSAID test.

DoF

- Support the VSFS, protection and afforestation of vulture nesting trees and awareness raising.
- In central level, play role is supporting the national vulture recovery committee.

DoA

- Monitor the use of Agro-chemicals impacting the vultures and raise awareness among the farmers to be part of the ecosystem management and conservation activities.

2.5.3 Role of Research Institutions and Academia such as Tribhuvan University

- To collaborate with the NVRC for conducting and disseminating research and monitoring related to vulture conservation, status and recover of vultures, and other areas prescribed in this plan.

2.5.4 Role of Civil Society and Private Sector

- Help disseminating information on conservation of vultures and cross-check if veterinary practitioners are using diclofenac and other dangerous drugs for vultures in their areas, protect nesting colonies of vultures.

2.5.5 Role of Local Government

- DDC: In the district, DDC can consolidate the role of the line agencies, NGOs and civil society to strengthen the vulture conservation. The declaration of the diclofenac free zone and support to continue ban can be streamlined by DDC.
- VDC: VDC can partner the sites of VSZ and assist the overall vulture conservation in the area.

2.6 MONITORING THE IMPLEMENTATION OF ACTION PLAN

- DNPWC will implement and monitor the plan.
- Mid-term review will be conducted during the third year of the implementation.
- Final review and update of the plan will be done during the 5th year of implementation so that the new revised/updated conservation plan will be ready by the time of the termination of the period of this plan period.

Vulture Safe Feeding Site, Gaidatal, Rupandehi

Photo © Bird Conservation Nepal

2.7 BUSINESS PLAN

Institutional Arrangement

DNPWC will implement Vulture Conservation Action Plan. Other partners will take lead for the implementation of this plan in the respective areas.

At the central level, National Vulture Recovery Committee will provide technical advisory role, policy guidance, and coordination.

At the mid level, vulture conservation core team will be formed to provide technical assistance to implement VCAP.

At the local level, Project Implementation Committee (PIC) will be formed as per need to ensure effective management and implementation of the specific project.

Human Resources

DNPWC, DFO, DDA, DLS and other partner organizations shall try to mobilize their existing human resources for the implementation of VCAP. For the management of Vulture Conservation and Breeding Center following staffs are working.

Staffing	DNPWC	NTNC
Existing	• Project Coordinator • Project Manager	• Senior keeper • Keepers x3
Required		Foreman/security

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

	Bird Conservation Nepal	Local Communities
Existing	• Vulture Conservation Programme Officer • Field Biologist • Veterinary Officer x2 • Field Officer	• Community Service Assistant x1 • Cow farm caretakers x 7
Required	• Program Coordinator • Field Biologist x3	

Physical resources

While using existing physical resources of DNPWC and partner organizations, some of the programs and activities proposed in VCAP demand some additional physical resources. For example to implement release of vulture following additional physical resources are required:

- Soft release aviary
- Motorbike
- Vehicle

Financial Requirements in NRs. ('000)

	Year I	Year II	Year III	Year IV	Year V	Total
Programme cost	14685	23415	22390	19175	21359	101024
Administrative Cost	1468.5	2341.5	2239	1917.5	2135.9	10102.4
Total cost	16153.5	25756.5	24629	21092.5	23494.9	111126.4

Implementation

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, ICBP, SAVE, WWF have been contributing technical and financial support. Further partnership will be developed with INGOs, NGOs, government line agencies and CBOs for implementation of VCAP.

Recovery Plan and its recommendations will be done through collaboration with regional partners from India and Pakistan. Partnership with the DLS and DDA will be developed to promote use of safe drugs such as Meloxicam and other alternatives safe NSAIDs.

Monitoring and Evaluation

DNPWC will monitor and evaluate the implementation of VCAP.

2.8 LOGICAL FRAMEWORK

Hierarchy of Objectives	Objectively Verifiable Indicators	Means of Verification	Risks/ Assumptions
Goal: To prevent the extinction of vulture in Nepal			
Objective: Restore viable wild populations of all species of vultures through provision of safe food, maintenance of suitable habitat and captive-breeding and re-introduction.	**By 2019:** • No vulture, including remotely tracked individuals, dies from diclofenac or other vulture-toxic NSAID. • Wild populations and nesting sites of all species of vulture are increased.	Vulture death reports. Vulture re-introduction report. Vulture population and nesting survey report. SAVE report.	
Outputs:			
Available NSAIDs are primarily meloxicam and/or other vulture-safe compounds; with no diclofenac or other vulture-toxic compound.	**By 2019** • An enforced ban on multi-dose vials of diclofenac. • An enforced ban on veterinary and multi-dose aceclofenac. • An enforced ban on veterinary and multi-dose ketoprofen. • Regulatory mechanism to ban other NSAIDs shown to be vulture-toxic. • Diclofenac and other vulture-toxic NSAIDs constitute 0% of NSAIDs available for veterinary use. • Meloxicam and/or other vulture-safe NSAIDs constitute 90% of NSAIDs available for veterinary use (thereby 10% of NSAIDs are untested).	DDA/DLS directives. DDA records. Pharmacy survey report. Vulture re-introduction report. SAVE report.	Political stability to implement regulations and directives effectively.
Wild breeding populations of WRV, SBV and RHV are increased.	**By 2019** • Increase in wild RHV, SBV and WRV populations by 10% as of 2014 baseline. • Increase in wild RHV, SBV and WRV nesting by 10% as of 2014 baseline. • Decrease in wild vulture deaths caused by incidental poisoning, electrocution and other causes by 90% of 2014 baseline.	Vulture population and nesting survey report. Vulture death reports. SAVE report.	A novel, unforeseen threat emerges.
WRV are successfully bred in captivity and released into the wild.	**By 2019** • All captive vultures sexed and sex ratio balanced in aviaries. • At least 20 WRV successfully raised in captivity. • At least 20 captive WRV successfully released.	VCBC report. Vulture releases report. SAVE report.	Captive population of WRV remains healthy.
Science based information system maintained.	**By 2019** • Four annual surveys of RHV, SBV and WRV population and nesting colonies. • Four annual open and undercover surveys of pharmacies. • At least 2 studies on the ecology and/or biology of RHV, SBV and WRV. • Three years of telemetry data for released captive vultures. • One central database maintained.	Vulture population and nesting survey report. Individual species studies. Pharmacy survey report. Vulture release report. Central database. SAVE report.	Partners input vulture related information to strengthen the central database system.

Hierarchy of Objectives	Objectively Verifiable Indicators	Means of Verification	Risks/ Assumptions
Vulture conservation awareness among general public increased.	**By 2019** ● Six VSFS maintained. ● Vulture Conservation Steward initiative for groups of people or individuals who supports vulture conservation works established at 80% of known RHV, SBV and WRV nesting sites. ● DFZ initiative expanded into at least 25 districts. ● VSZ initiative expanded into the eastern lowlands.	SAVE report.	General public are receptive to the ecosystem service of vultures.
Partnership among national and international organizations maintained.	**By 2019** ● Government contribution on vulture conservation increases by 25% of the 2014 baseline. ● Regular funding support from the partner organizations both nationally and internationally. ● At least 1 national and regional meeting each year.	Government department reports. MoUs, contracts, Letters of Support and reports to partners. SAVE report.	Adequate funding and technical support is readily available.

2.9 SUMMARY OF THE BUDGET

	Budget NRs. ('000)					
Activities of Vulture Conservation Action Plan	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Output I: Available NSAIDs are primarily meloxicam and/ or other vulture-safe compounds; with no diclofenac or other vulture-toxic compound.	1650	1955	1910	1915	1920	9350
Output II: Wild breeding populations of WRV, SBV and RHV are increased.	1225	1775	1300	1405	1515	7220
Output III: WRV are successfully bred in captivity and released into the wild.	5210	10500	7010	7250	7794	37764
Output IV: Science based information system maintained.	2500	3050	3000	3300	3900	15750
Output V: Vulture conservation awareness among general public increased.	3400	4105	4410	4365	4710	20990
Output VI: Partnership among national and international organizations maintained.	700	1030	860	940	1020	4550
Monitoring, Mid-term and final review			500		500	1000
Additional activities (Infrastructure, Equipment and transportation)		1000	3400			4400
Administrative Cost	**1468.5**	**2341.5**	**2239**	**1917.5**	**2135.9**	**10102.4**
Total	**16154**	**25756.5**	**24629**	**21092.5**	**23494.9**	**111126.4**

Vulture Conservation and Breeding Centre, Kasara, Chitwan

Photo © Khadananda Paudel/BCN

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ANNEXES

ANNEX-I: Five Years Costing of Vulture Conservation Action Plan (2015-2019)

Activities	Budget required	Budget NRs. ('000)					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
Output I: Available NSAIDs are primarily meloxicam and/or other vulture-safe compounds; with no diclofenac or other vulture-toxic compounds.							
i) Advocate a ban on multi-dose vials of diclofenac.	250	100	150				250
ii) Advocate a ban on veterinary and multi-dose vials of aceclofenac.	100		100				100
iii) Advocate a ban on veterinary and multi-dose vials of ketoprofen.	150		150				150
iv) Advocate a regulatory mechanism to ban other NSAIDs shown to be vulture-toxic.	500	100	100	100	100	100	500
v) Enforce present ban on diclofenac and future bans.	1150	200	200	250	250	250	1150
vi) Enforce prescription-only and recorded sales of NSAIDs.	500	100	100	100	100	100	500
vii) Engage Wildlife Crime Control Bureau and police to stop importation of multi-dose vials of diclofenac.	1150	200	200	250	250	250	1150
viii) Engage agencies and organisations working in Nepal-India border area to remove multi-dose vials of diclofenac.	1150	200	200	250	250	250	1150
ix) Continue to raise awareness of the vulture-toxic and vulture-safe NSAIDs.	1150	200	200	250	250	250	1150
x) Provide monetary incentives to use meloxicam (ie remove taxes, subsidise, etc.).	1150	200	200	250	250	250	1150
xi) Promote good quality meloxicam (ie neutral pH and 20 mg/ml).	900	150	150	200	200	200	900
xii) Promote other NSAIDs shown to be vulture-safe and of good quality (if identified).	900	150	150	200	200	200	900
Output II: Wild breeding populations of WRV, SBV and RHV are increased.							
i) Conduct post mortem examination of all dead vultures found.	920	250	250	100	150	170	920
ii) Advocate a ban on carcass poisoning; and dog control measures.	700	115	125	140	150	170	700
iii) Raise awareness about incidental poisoning in areas where it occurs.	1400	230	250	280	305	335	1400
iv) Employ mitigation measures to prevent electrocution in areas where it occurs.	700	115	125	140	150	170	700
v) Engage and support communities in nesting site and tree protection.	1150	200	200	250	250	250	1150

Activities	Budget required	Budget NRs. ('000)					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
vi) Advocate leaving livestock where they fall for vultures or informal feeding sites.	1150	200	200	250	250	250	1150
vii) Amend the conflicting acts and regulations to facilitate vulture conservation.	200		200				200
viii) Include RHV, SBV and WRV in the list of protected bird.	200		200				200
ix) Secure long-term funding and sustainable practice for in-situ activities.	100		100				100
Output III: WRV are successfully bred in captivity and released into the wild.							
i) Continue the captive breeding programme.	22564	4000	4000	4400	4840	5324	22564
ii) Continue bio-security, regular health screening and veterinary care at VCBC.	1400	250	250	300	300	300	1400
iii) Ensure legal dispensation to ensure captive population is not culled during a outbreak.	150		150				150
iv) Determine sexes of the captive population using genetic techniques.	600	500	100				600
v) Plan the reintroduction programme.	250		250				250
vi) Develop trans-boundary cooperative with Indian agencies and organisations to extend VSZ conservation actions into India to ensure for 100km radius VSZ from identified release sites in Nepal.	1400	230	250	280	305	335	1400
vii) Construct necessary building and infrastructure for reintroductions.	4000		4000				4000
viii) Balance sex ratio in aviaries and use unbalanced sex to trial reintroduction methods.	250			250			250
ix) Determine the prevalence of diclofenac in vulture food and the adaption of released vultures into the wild using remote tracking techniques and both wild and captive WRV.	4500			1500	1500	1500	4500
x) Create Emergency Fund for crisis management including disease outbreaks.	1000		1000				1000
xi) Secure long-term funding for ex-situ activities.	250		250				250
xii) Building expertise and workforce for both programmes.	1400	230	250	280	305	335	1400
Output IV: Science based information system maintained.							
i) Monitor vulture populations using road transect surveys.	1830	300	330	360	400	440	1830
ii) Monitor vulture population breeding success using nesting site surveys.	1830	300	330	360	400	440	1830
iii) Monitor NSAID availability in veterinary pharmacies through open and undercover surveys.	1830	300	330	360	400	440	1830
ii) Monitor NSAID prevalence in livestock and vulture carcasses.	3000	500	550	600	650	700	3000
iii) Expand knowledge on vulture biology and ecology.	1830	300	330	360	400	440	1830
iv) Expand expertise in field, lab and desk based science.	1830	300	330	360	400	440	1830
v) Assemble and maintain a central database.	600		300			300	600

Activities	Budget required	Budget NRs. ('000)					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
vi) Produce reports, articles and other media for dissemination among a varied audience.	3000	500	550	600	650	700	3000
Output V: Vulture conservation awareness among general public increased.							
i) Continue to raise awareness of the diclofenac-problem and the meloxicam-solution.	650	100	115	130	145	160	650
ii) Continue to raise awareness of vultures and the ecosystem service they provide.	650	100	115	130	145	160	650
iii) Maintain VSFS and informal feeding sites in the western lowlands.	6000	1000	1100	1200	1300	1400	6000
iv) Expand DFZ and VSZ initiatives into the eastern lowlands.	3000	500	550	600	650	700	3000
v) Establish Vulture Stewardship initiative at important nesting sites in the western and eastern lowlands.	1830	300	330	360	400	440	1830
vi) Establish information centres at all VSFS, informal feeding sites and Vulture Stewardship Sites.	1900	300	500	500	300	300	1900
vii) Advocate the integration of vulture conservation into community forest management.	1830	300	330	360	400	440	1830
viii) Provide necessary knowledge, skills and materials for vulture conservation to individuals and communities contributing to vulture conservation.	650	100	115	130	145	160	650
ix) Recognize and reward communities and individuals for their effort in vulture conservation.	3000	500	550	600	650	700	3000
x) Allow the transfer of knowledge between engaged individuals and communities through meetings, site visits and dissemination in the media.	1480	200	400	400	230	250	1480
Output VI: Partnership among national and international organizations maintained.							
i) Secure 5% of the government budget under Conservation specifically for vulture conservation.	250		250				250
ii) Maintain good relationships with INGOs that provide funds and/or expertise through meeting objectives and timely reporting.	650	100	115	130	145	160	650
iii) Partner with national, regional and/or international organisations to secure big funds; particularly, Indian partners working within 100km from potential release sites in Nepal.	650	100	115	130	145	160	650
iv) Participate in national, regional and international meetings and workshops to build networks and expertise.	3000	500	550	600	650	700	3000

ANNEX-II: List of DFZs in Nepal with the dates of declaration

S.N.	Districts	Date declared	Area in Sq. Km.
1	Dang	26-Nov-10	2,955
2	Chitwan	25-Dec-10	2,218
3	Kanchanpur	28-Dec-10	1,610
4	Banke	1-Jan-11	2,337
5	Nawalparasi	16-Jan-11	2,162
6	Palpa	21-Jan-11	1,373
7	Kailali	25-Jan-11	3,235
8	Kapilvastu	26-Jan-11	1,738
9	Bardia	28-Jan-11	2,025
10	Rupandehi	17-Feb-11	1,360
11	Kaski	28-Feb-11	2,017
12	ILam	12-Mar-11	1703
13	Lamjung	12-May-11	1,692
14	Arghakanchi	1-Jun-11	1,193
15	Ramechhap	May-11	1,546
16	Dhanusha	May-11	1180
17	Gulmi	8-Apr-12	1149
18	Syanja	23-Apr-12	1164
19	Tanahun	17-Jun-12	1546
20	Gorkha	2-Jul-12	3,610
21	Pyuthan	2-Jul-12	1309
22	Salyan	12-Dec-12	1462
23	Baitadi	20-Dec-12	1519
24	Dadeldhura	22-Dec-12	1538
25	Myagdi	25-Jan-13	2297
26	Baglung	30-Jan-13	1784
27	Dhading	1-Feb-13	1926
28	Surkhet	12-Feb-13	2451
29	Parbat	15-Feb-13	494
30	Rolpa	20-Feb-13	1879
31	Manang	17-May-13	2246
32	Mustang	21-May-13	3573
33	Doti	18-Jun-13	2025
34	Dolpa	11-Dec-13	7889
35	Sunsari	23-Apr-14	1257
36	Dailekh	25-Aug-14	1505
37	Mugu	21-Nov-14	3535
38	Humla	27-Nov-14	5655
39	Jumla	3-Dec-14	2531
40	Kalikot	5-Dec-14	1741
41	Darchula	23-Dec-14	2322
42	Bajhang	26-Dec-14	3422
43	Bajura	29-Dec-14	2188
44	Achham	31-Dec-14	1692
45	Rukum	26-Jan-15	2877
46	Jajarkot	5-Feb-15	2230
		Total Area	**101,160**

(Source: BCN, unpublished)

Annex- III: The Action Timelines for Nepal (SAVE Blueprint, 2014 updated)

Action Timelines for advocacy, awareness raising and regulation at the national level (AD). Part 1.

Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2024	2023	2025
AD1	Achieve the removal from the market of vials of diclofenac supposedly intended for human medicine in excess of 3 ml capacity.	Propose restrictions on large vials to the Regional Steering Committee, governments and pharmaceutical industry. Establish the restrictions.			Provide technical assistance and advice on the operation of the ban, using information from monitoring.								
AD2	Achieve the banning of the veterinary use of ketoprofen and aceclofenac in India, Pakistan, Bangladesh and Nepal.	Discuss the issue with the Regional Steering Committee, governments and pharmaceutical industry using research results. Initiate discussions with the Regional Steering Committee, governments and pharmaceutical industry. Establish a procedure.		Provide technical assistance and advice on the operation of the ban, using information from monitoring.									
AD3	Establish a procedure in India and Nepal through which identification by testing of a drug hazardous to vultures at or below maximum likely exposure levels leads to a ban on its use for veterinary purposes.	Initiate discussions with Regional Steering Committee, governments and pharmaceutical industry. Establish procedures.			Provide technical assistance and advice on the operation of the procedure, using information from monitoring. Engage with the pharmaceutical industry to do this.								
AD4	Establish procedures in India and Nepal by which veterinary drugs with unknown effects on vultures have their approval for veterinary use withheld or withdrawn until scientific testing on Gyps vultures establishes their safety at maximum likely exposure levels.	Initiate discussions with Regional Steering Committee, governments and pharmaceutical industry. Establish procedures.			Provide technical assistance and advice on the operation of the procedures, using information from monitoring. Engage with the pharmaceutical industry to do this.								

Action Timelines for advocacy, awareness raising and regulation at the national level (AD). Part 2.

Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2024	2023	2025
AD5	Work with both the pharmaceutical industry and governments to identify, by a robust safety testing and approval process, NSAIDs that are safe for vultures. Currently meloxicam is the only such drug.	Provide encouragement and technical advice.											
AD6	Contribute, with government agencies and pharmaceutical companies, to maintaining pharmacovigilance and regulation of veterinary drugs, to prevent their negative effects on wild vultures.	Use monitoring information on the performance of the regulatory procedures and propose improvements.											
AD7	Establish a SAVE alert system for veterinary drugs which combines information of levels of use from pharmacy surveys and analyses of cattle carcasses with results from safety testing to draw attention of governments to potentially hazardous drugs.	Establish system within SAVE.		Operate system and provide advice to the Regional Steering Committee, governments and pharmaceutical industry.									
AD8 (action added Nov. 2014)	Improve the availability of more effective meloxicam formulations thereby facilitating take up by veterinary practioners	Contact and sensitisation of pharma industry. Sensitise drug regulation authorities in each country to take appropriate steps to favour production of well formulated veterinary meloxicam.											

Action Timelines for conservation breeding (CB). Part 2.

Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
CB5	Conservation breeding of OWBV at VCBC Chitwan (Nepal).	Maintain the captive population in good health. Produce as many fledglings as possible by natural methods.		Maintain the captive population in good health. Produce as many fledglings as possible by natural methods. Transfer some wild-bred birds to release facility.		Maintain the captive population in good health. Produce as many fledglings as possible by natural methods. Transfer captive-bred immatures to release facility.					Maintain the captive population in good health. Produce sufficient fledglings to replace adult losses.		

Action Timelines for Vulture Safe Zone implementation (VS). Part 1.

Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
VS6	Maintenance and review of VSZs in Nepal.	Continue VSZ implementation and expansion											
VS7	Release of wild-taken and captive-bred vultures in VSZs in Nepal.			Releases of wild-taken OWBV not likely to breed from Chitwan VCBC.			Releases of captive-bred OWBVs.						

Action Timelines for Vulture Safe Zone implementation (VS). Part 2.

Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
VS13	Community-led vulture-based ecotourism in pVSZs and VSZs in India, Nepal and Pakistan.	Develop and implement programme.											

Action Timelines for Vulture Safe Zone monitoring (ZM).

Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ZM1	Monitoring of survival and causes of death of wild vultures with GPS PTTs in pVSZs and VSZs in India and VSZs in Nepal	Seek permits for capture and tagging of wild vultures in VSZs.		Capture and tag samples of wild vultures with GPS tags. Monitor to identify foraging sites, recover corpses and establish cause of death.									
ZM2	Monitoring of survival and causes of death of released vultures with GPS PTTs in pVSZs and VSZs in India and VSZs in Nepal			Tag all captive-bred vultures prior to release with GPS tags. Monitor to identify foraging sites, recover corpses and establish cause of death.									
ZM4	Monitoring of availability of NSAIDs for veterinary use in representative samples of pharmacies and other outlets in pVSZs and VSZs in India, Pakistan, Bangladesh and Nepal	Conduct undercover surveys of outlets for veterinary drugs. Record NSAIDs offered for use for veterinary purposes. Identify the provenance and vial size of diclofenac offered illegally for veterinary use.											
ZM5	Monitoring of wild vulture populations and breeding success in pVSZs and VSZs in India, Pakistan, Bangladesh and Nepal.	Conduct surveys over representative areas of the zone, including nest counts and/or road transect surveys, as appropriate											

Action Timelines for research and monitoring at the national level (RM). Part 1.

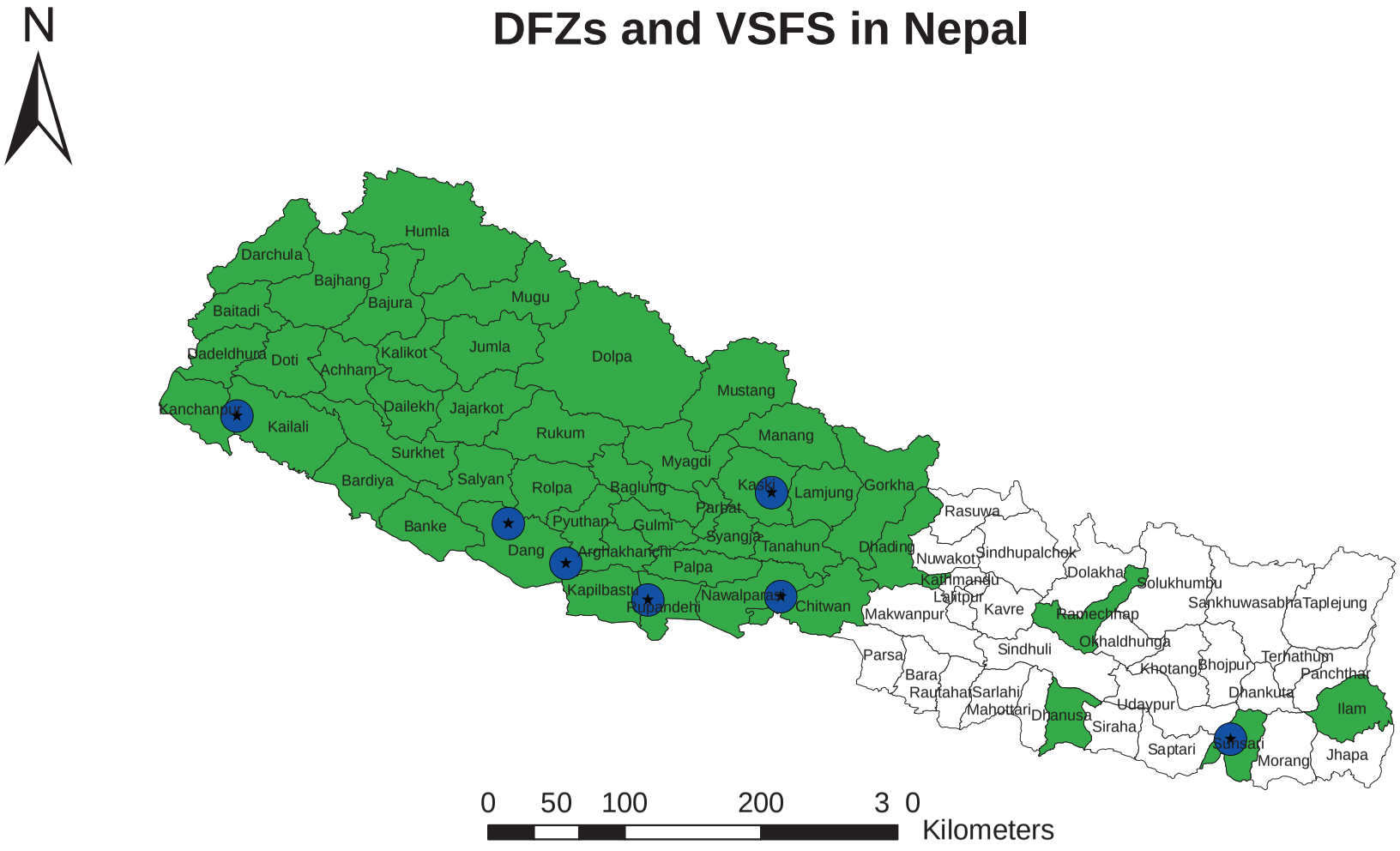
Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
RM1	Develop method for GPS PTT vulture tracking and corpse recovery in VSZs.	Complete tagging and recovery tests on RHV and LBV. Evaluate corpse recovery using simulated tagged corpses. Test tag attachment methods on captive Gyps vultures.		Begin tag deployment on Gyps vultures in pVSZs and VSZs.									
RM3	Road transect surveys of vulture numbers in Nepal.	Conduct survey using same methods as in previous surveys. Western lowland surveys annually. Midhills and East-West highway survey every four years.											
RM5	Monitoring of NSAID contamination of ungulate carcasses in northern India and Nepal.	Complete current round of sample collection in several states. Measure concentrations of all NSAIDs thought to be potentially hazardous to vultures	Publish NSAID monitoring results and expected effects on vulture death rates	Collect samples in several states according to previous protocol. Measure concentrations of all NSAIDs thought to be potentially hazardous to vultures		Publish NSAID monitoring results and expected effects on vulture death rates	Collect samples in several states according to previous protocol. Measure concentrations of all NSAIDs thought to be potentially hazardous to vultures		Publish NSAID monitoring results and expected effects on vulture death rates	Collect samples in several states according to previous protocol. Measure concentrations of all NSAIDs thought to be potentially hazardous to vultures		Publish NSAID monitoring results and expected effects on vulture death rates	

Action Timelines for research and monitoring at the national level (RM). Part 2.

Time-line code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
RM6 (B'desh added Nov. 2014)	Monitoring of causes of death and NSAID contamination of wild vultures in India, Pakistan, Nepal and Bangladesh.	Collect as many dead wild and released vultures as possible. Conduct post mortem examinations to determine causes of death. Take liver and kidney samples and determine concentrations of all NSAIDs known to be in veterinary use. Trial methods to detect NSAIDs in bone and other hard tissues. Retain carcasses frozen for future use. Publish the results periodically.											
RM8	Monitoring of availability of NSAIDs for veterinary use in pharmacies and other outlets in India, other than in VSZs. Equivalent surveys in Nepal are mainly in VSZs and covered by ZM4.	Complete current round of undercover and open pharmacy surveys linked with sampling of ungulate carcasses (see timeline RM4).	Publish NSAID availability monitoring results.	Conduct undercover and open pharmacy surveys linked with sampling of ungulate carcasses (see timeline RM4). Publish NSAID availability monitoring results.		Publish NSAID availability monitoring results.	Conduct undercover and open pharmacy surveys linked with sampling of ungulate carcasses (see timeline RM4).		Publish NSAID availability monitoring results.	Conduct undercover and open pharmacy surveys linked with sampling of ungulate carcasses (see timeline RM4).		Publish NSAID availability monitoring results.	

Action Timelines for research and monitoring at the national level (RM). Part 3.

Timeline code	Activity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
RM10	Estimation of the former and potential future value of the ecosystem services provided by wild vultures.	Conduct a survey of costs of cattle carcass disposal, feral dog control and other ecosystem service measurements.											
RM11	Investigate factors affecting use of vulture-safe NSAIDs by veterinarians, paravets and livestock owners.	Conduct questionnaire studies, choice experiments and other investigations, as appropriate.											



Legend

- Vulture Safe Feeding Site (VSFS)
- Diclofenac Free Zones (DFZs)

White-rumped Vulture

Photo © Rajendra Gurung /BCN

The Vulture Conservation Action Plan (2015-2019) has been prepared in collaboration with Bird Conservation Nepal.

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