

# Population Modeling and Conservation of Endangered Vultures in Annapurna Conservation Area.

## Full report



### Submitted by

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### Submitted to

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## Summary

The project site Annapurna Conservation Area (ACA) is the largest conservation area and Important Bird Area (IBA) of Nepal having significant breeding colonies of Himalayan Vultures (HV). Conduction of capacity building training and workshop for local people, monitoring Himalayan Vultures, launching educational conservation outreach programs and study of feasibility of Diclofenac free 'Vulture Safe Zone' (VSZ) for making the IBA as safe habitat for endangered Vultures and other scavenging birds were the major aims of the project. We spent six days for preliminary presence absence survey and 10 days for extensive survey of Vultures in the line transect from Muktinath to Pokhara covering all potential sites starting from 7:30 am to 5:00 pm walking 6-8 hours per day and averaged 15 km per day,. All the Vultures sighted were recorded in data sheet and in Germin GPS. This project successfully declared the Manang and Mustang Districts of ACA as Diclofenac Free Districts and spread the conservation messages to more than 2,500 people. We have recorded the four species of Vultures. The maximum 183 count for the HV and least two for critically endangered White rumped Vulture. We recorded 22.9 HV per day and 1.525 HV per km line transect which was almost twice as many recorded during surveys that were conducted between 2002 and 2006 where the mean number of HV was 12.4 per day. Our results suggest a healthy population of HVs in the Annapurna Conservation Area of Nepal after the implementation of conservation programs in the area.

## Introduction

### 1.1 Background

Vultures are the natural scavengers and large birds of prey that habitually feed on carrion. These are found on every continent except Antarctica and Oceania. Although feeding largely on meat, these do not generally kill their own prey. A particular characteristic of many Vultures is bald head i.e. devoid of feathers. This is because a feathered head would become spattered with blood and other fluids and thus will be difficult to keep clean when feeding. Physiologically the bare skin areas in Griffon Vultures play an important role in thermo-regulation (Ward et al. 2008). These 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).

### 1.2 Vultures of Nepal

There are nine species of Vultures recorded from Indian subcontinent (Ali and Ripley 1968), now, all of them are confined in Nepal (BCN 2011) of which five belongs to the genus *Gyps* (Prakash 1999). Three *Gyps* Vultures, namely the Oriental White-rumped Vulture (OWRV) *Gyps bengalensis*, Long-billed Vulture (LBV) *Gyps indicus* and Slender-billed Vulture (SBV) *Gyps tenuirostris* are residents, and the remaining two, the Eurasian Griffon (EG) *Gyps fulvus* and Himalayan Vulture (HV) *Gyps himalayensis* are largely wintering species (Prakash et al. 2003). Other Vulture species include Bearded Vulture (BV) *Gypaetus barbatus*, Egyptian Vulture (EV) *Neophron percnopterus*, Red-headed Vulture (RV) *Sarcogyps calvus* and Cinerous Vulture (CV) *Aegypius monachus*. OWRV and LBV were abundant across large parts of India until the 1990s. The SBV, which was not distinguished as a separate species from LBV until recently (Rasmussen and Parry 2001), was also locally common in north and north-eastern parts of the Indian subcontinent (Ali and Ripley 1968). During the 1980s, OWRV was thought to be the commonest large bird of prey in the world (Houston 1985). Gyps Vulture densities were so high in some areas that they were considered a hazard to aircraft (Grubh et al. 1990).

### 1.3 Status of Vultures

The population of resident Gyps Vultures in the Indian subcontinent have undergone dramatic declines in numbers since the mid 1990s, with declines in excess of 97% for three resident species i.e. OWRV, SBV and LBV (Prakash et al. 2003; Green et al. 2004). In India, numbers of OWRVs have declined by 99.9% from 1992 to 2007 (Prakash et al. 2007). 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 (DNPWC/MoFSC/GoN 2009). Recent research in India shows a sharp decline in the population of Red-headed Vultures and Egyptian Vultures (Cuthbert et al. 2006). In 2007, Red-headed Vultures were declined by 91% and Egyptian Vultures were declined by 80% (Vulture Conservation and Breeding Program, 2010). So, these were listed as Critically Endangered" and Endangered" respectively (IUCN, Vulture Rescue, Birdlife International and The Peregrine Fund 2010). Altogether four species of Vulture i.e. OWRV, LBV, SBV and Red-headed Vulture in Asia are now classified as Critically Endangered and one species i.e. Egyptian Vulture is classified as Endangered (IUCN 2010). The study from 2002 to 2005 shows 67% decline of HV (Acharya et al. 2009) and study from 2002 to 2008 shows 73% decline of BV in the number of individuals recorded per day in Upper Mustang (Acharya et al. 2010). Hence, these species have been upgraded to near threatened from least concerned by Birdlife International (BirdLife International 2014). Considerable evidence now indicate that the catastrophic Vulture decline has been caused by the NSAID Diclofenac, which is widely used to treat livestock across the Indian sub-continent (Green et al. 2004; Oaks et al. 2004; Shultz et al. 2004). These are exposed to Diclofenac when they feed on 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 also toxic to Himalayan Vultures *Gyps himalayensis* (Das et al. 2010).

## Objectives

1. To conduct capacity building training and workshop to enhance the skills of local people on conservation and monitoring of species.
2. To monitor Vultures, abundance, their nests, breeding success, carcass availability and veterinary drug extensively.
3. To conduct conservation education and outreach programs for locals, students, teachers, media persons, politicians, organization members and local government agencies.
4. To study the feasibility of Diclofenac free 'Vulture Safe Zone' (VSZ) for making the IBA as safe habitat for endangered Vultures and other scavenging birds.

## Methods

### **i) Preliminary survey**

Preliminary survey of Vultures was done in March from Beni, Pakhapani, Kuine and back to Beni (6 days). During this survey we recorded four abandoned nests of Himalayan Vulture (HV) in the high cliff of Pakhapani. We also recorded the four HV, two bearded Vulture (BV) four Egyptian Vulture (EV) (Endangered) feeding on the carcass of a cow falling down from the cliff due to heavy hailstones during grazing. We continued our survey trek towards Galeshor, Tiplyang, Tatopani, Dana, Kopchepani, Talbagar, Pairothapla, Thaplyang, Ghasa, Chhayu, Lete, Kokhrthanti, Larjung, Kobang, Tukuche, Marpha, Syang, Jomsom, Eklebhati, Kagbeni, Khinga, Jharkot, Ranipauwa, and Muktinath top and returned back to Tatopani by bus for Ghorepani and Ghandruk survey trek (8 days). We continued the next survey trek from Besisahar to Chame via Bhulbhule, Khudi, Nadi, Bahundanda, Ghermu, Syange, Jagat, Chamje, Tal, Dharapani, Bagarchhap, Danakyu, and Latamro (6 days). We covered Kaski, Muagdi, Lamjung, Manang and Mustang districts of Annapurna Conservation Area. We observed significant number of Vultures in the route from Muktinath to Ghandruk and Pokhara which was selected for further survey.

During the preliminary survey we coordinated with local government bodies, local schools, conservation agencies, political leaders, local farmers and District Livestock Service Offices (DLSO) of both Manang and Mustang districts for extensive Vulture survey, capacity building awareness outreach and monitoring of NSAIDs drug Diclofenac regularly.

### **ii) Capacity building training**

Three capacity building training events for local community groups from seven conservation units covering 57 VDCs of ACA were conducted successfully with field-based observation making them able to carry out monitoring and conservation activities in local level during the Diclofenac Free District declaration events.

### **iii) Extensive survey**

The team conducted extensive replication survey of Vultures immediately after the declaration of Diclofenac-Free Districts. We spent 10 walking days in the line transect from Muktinath to Pokhara covering all potential sites Ranipauwa, Jharkot, Khinga, Lupra, Kagbeni, Eklebhati, Jomsom, Syang, Marpha, Tukuche, Kobang, Larjung, Kokhrthanti, Lete, Chhayu, Ghasa, Thaplyang, Pairothapla, Talbagar, Kopchepani, Dana, Tatopani, Ghara, Shikha, Chitre, Ghorepani, Ban Thanti, Tadapani and Ghandruk. We walked 6-8 hours per day and averaged 15 km per day, starting from 7:30 am to 5:00 pm. All the Vultures sighted were recorded in data sheet and in Germin GPS.

### **iv) Awareness raising, advocacy, government engagement and promotion**

The project published 500 awareness posters, 5000 pocket calendars with eco-days and awareness leaflets, 50 T-shirts, six awareness flexes and six event flexes. We distributed and attached the awareness publications during our survey in each and every hotels, lodges, schools, tea and coffee shops where we rested. The team flooded the messages of Vulture and nature conservation with

each and every person in the field at rest. The awareness raising materials were used in each and every eco-day's celebration and distributed to all participants. The awareness and event flexes were used during school outreach events, eco days celebration and Diclofenac-free district declaration programmes. The awareness posters, calendars and leaflets were attached on the notice boards of the NTNC Pokhara, ACA information centres, local government offices, community organizations, schools, hotels and restaurants of ACA. We also promoted and attached the posters of 'Vultures of Nepal' published by BCN and 'Save the Vultures' gifted by Himalayan Nature during events and in the fields.

#### **v). Support for wildlife week celebration**

The project supported for celebration of 'Wildlife Week' in Pokhara on the first week of Nepali new year (April 14<sup>th</sup> to 20<sup>th</sup>). Our education and outreach officer Sonam Tashi Lama coordinated with 10 green organizations (Alumni Association for Conservation and Development, BAT Friends Pokhara, Bird Conservation Nepal - Pokhara Branch, Foresters Alliance for NTFP, Foresters' Association for Transformation, Himalayan Scholar Group for Nature Conservation, Prakirti Sahitya Manch, Self-Help Environment Association Camp, Society for Wildlife Research and Conservation and Union for Nature Conservation - Nepal) of Institute of forestry and Dean office Pokhara to organise the events aiming to create mass awareness on wildlife conservation. The event started with conservation rally and street drama on the first day and followed sanitation programme, speech competition, birding, documentary shows, plantation and presentations on wildlife conservation and management during a week-long event.

#### **vi). Participation in World Migratory Bird Day and World Environment Day:**

The team members actively participated in the 'World Migratory Bird Day' with the theme 'Networking for Migratory Birds' organised by BCN on 11<sup>th</sup> May in Godawari forest. Similarly we participated via BCN in the 'World Environment Day' on 5<sup>th</sup> June with the theme 'Think-Eat-and-Save' which was jointly organised by Central Zoo, National Trust for Nature Conservation (NTNC), IUCN, WWF Nepal and Lalitpur Sub-Metropolitan City. More than 2,000 students from various schools, representatives of government and non-governmental organisations and media persons participated in the event. A rally was also organised in the Lalitpur to spread the awareness message in accordance to the world theme of food security. We presented migratory birds and Vulture conservation documentary shows in three days exhibition (8<sup>th</sup>-10<sup>th</sup> June) targeting visual conservation messages to school students held in Taxus International Academy.

#### **vii) Diclofenac-Free Zone (DFZ) Declaration Programme**

We organised the Diclofenac-Free District Declaration Programme on 17<sup>th</sup> May 2013, in Chame, Manang district of Annapurna Conservation Area (ACA), jointly with District Livestock Service Office Manang, BCN and Global Primate Network (GPN) Nepal. During this event Manang district was formally declared as 'Diclofenac-Free District' by Chief District Officer (CDO) of Manang, Local Development Officer (LDO) from District Police Office and District Livestock Service Officer (DLSO). Altogether 36 people from different local government agencies, District Health Office (DHO), District Agriculture Development Office (DADO), District Forest Office, District Education Office (DEO), Women Development Office, District Finance Control Office, National Investigation Department Office, Local conservation agencies, NTNC-Annapurna Conservation Area Project (ACAP) Manang Unit Conservation, different political parties leaders, other Governmental and Non-Governmental Organisation (NGO) representatives, Community Based Organization (CBO) representatives, journalists, media person, local farmers, parents and students actively participated in the programme.

A similar programme was organised in Jomsom, Mustang of ACA on 21 May jointly with District Livestock Service Office Mustang, BCN and GPN Nepal. In this event Mustang district was formally declared as 32<sup>nd</sup> Diclofenac-Free District of Nepal by CDO -Laxmi Raj Sharma Gautam, DSP -Basanta

Ranjit and DLSO -Dr Guru Prashad Khakural. Altogether 41 people from local government bodies, veterinary professionals, LDO, DHO, DADO, DEO, Armed Police Force Office, District Soil Conservation Office, local journalists, media persons, local political leaders, NTNC-ACAP Jomsom Unit Conservation, NGO Federation, other governmental and non-governmental organisation representatives, CBO representatives, locally respected persons, local farmers, parents and students were participated with their keen interest.

During the event Bhupal Nepali, the field officer of BCN presented on Vulture, its importance and need of Vulture Safe Zone (VSZ) in Nepal. With brief history of Vulture conservation dealings in South Asia, the PI (Dikpal Krishna Karmacharya) presented on current updates and strategies of VSZ in Nepal. The Chairperson, DLSOs stated their reports of Diclofenac monitoring in Manang and Mustang districts and harmful effect of Diclofenac to Vultures. They added the current law and punishment for use of banned Diclofenac. A short documentary film of "Saving Asia's Vulture from Extinction" (SAVE) was shown for refreshment and to make the participants commitment for Vulture conservation. During occasions the chief guest and all participants signed in Diclofenac-Free District Declaration banner. The programmes were closed with birding and Vulture observation through binoculars in nearby area.

### Evaluations

Objective	Achievement Fully/Partially/Not	Comments
Capacity building of local community	Fully Achieved	Three capacity building training events for local community groups from seven conservation units covering 57 VDCs of ACA were conducted successfully with field-based observation making them able to carry out monitoring and conservation activities in local level.
Extensive exploration and research monitoring	Fully Achieved	Preliminary survey was done by the team identifying potential Vulture colonies and extensive replications were made by locally trained field biologists using direct sighting technique on road transects.
Coordination with government authorities and monitoring of veterinary drug-NSAIDs	Fully Achieved	Co-ordination with District Livestock Service Offices (DLSOs), Local Development Offices (LDOs), District Development Offices (DDOs), District Police Offices (DPOs), VDCs and veterinary practitioners of Manang and Mustang was well established conducting continuous monitoring of banned NSAIDs veterinary drug - Diclofenac.
Production of awareness and promotional materials	Fully Achieved	Relevant awareness materials (posters, leaflets, pocket calendars, T-shirts, awareness flex, hoarding boards) were developed which were distributed during each activities of the project. Outreach materials were also attached on the notice board of most of the schools, hotels and restaurants of the project area. These were also kept in the information centres of ACA and other conservation agencies spreading conservation messages in mass.

Objective	Achievement Fully/Partially/Not	Comments
Awareness campaigns and educational outreach	Fully Achieved	Project supported for celebration of World Environment Day, International Vulture Awareness Day, and Wildlife Week in Pokhara in coordination with 10 local environmental organisations organising conservation rally, street drama, documentary shows, birding and presentations. Vulture conservation slides were presented in seven local schools and two community groups. More than 2,500 people including local students, farmers and community organisation members got benefit from the events.
Formal declaration of "Diclofenac Free Zone" through district level workshops	Fully Achieved	Manang and Mustang districts of ACA were formally declared as 'Diclofenac Free Districts' by government's Chief Officers from DLSOs, LDOs, DDOs, DPOs which were jointly organized by Global Primate Network (GPN)-Nepal, Bird Conservation Nepal (BCN) and DLSO with support from veterinary community, media, political parties, community-based organisations and local conservation agencies.
Publication and dissemination	Fully Achieved	All the activities of project were disseminated in the forms of formal and informal reports and articles by partner organisations in local FM, radio, daily papers and bulletins. Moreover, the field data was gladly accepted and successfully published as online <b>METADATA</b> by Scholar Works, University of Alaska making the global access of data for concern researchers and decision makers. <a href="https://scholarworks.alaska.edu/bitstream/handle/11122/2592/Vultures%20Annapurna_FH4.xml.html?sequence=6">https://scholarworks.alaska.edu/bitstream/handle/11122/2592/Vultures%20Annapurna_FH4.xml.html?sequence=6</a> )

## Results

We have recorded the four species of Vultures. The maximum 183 count for the HV, 12 for EV and BV similarly least two for critically endangered White rumped Vulture.

We recorded 22.9 HV per day (183 HV) and 1.525 HV per km line transect covering an eight-day extensive exploration period. This was almost twice as many recorded during surveys that were conducted between 2002 and 2006 where the mean number of HV was 12.4 per day (Fig.1). Our results suggest a healthy population of HVs in the Annapurna Conservation Area of Nepal after the implementation of conservation programs in the area. We recorded 14 species of birds of prey (Table 1.)

Table 1. Raptor count 2013-2014 in ACA					
S.N.	Species	No.	S.N.	Species	No.
	Himalayan Vulture	183		Bonelli's Eagle	3
	Bearded Vulture	12		Black Kite	21
	Golden Eagle	15		Crested Serpent Eagle	1
	Common Kestrel	15		Mountain Hawk-Eagle	2
	Peregrine Falcon	2		Spotted Owlet	3
	Egyptian Vulture	12		Western Osprey	1
	Shikra	6		White-rumped Vulture	2

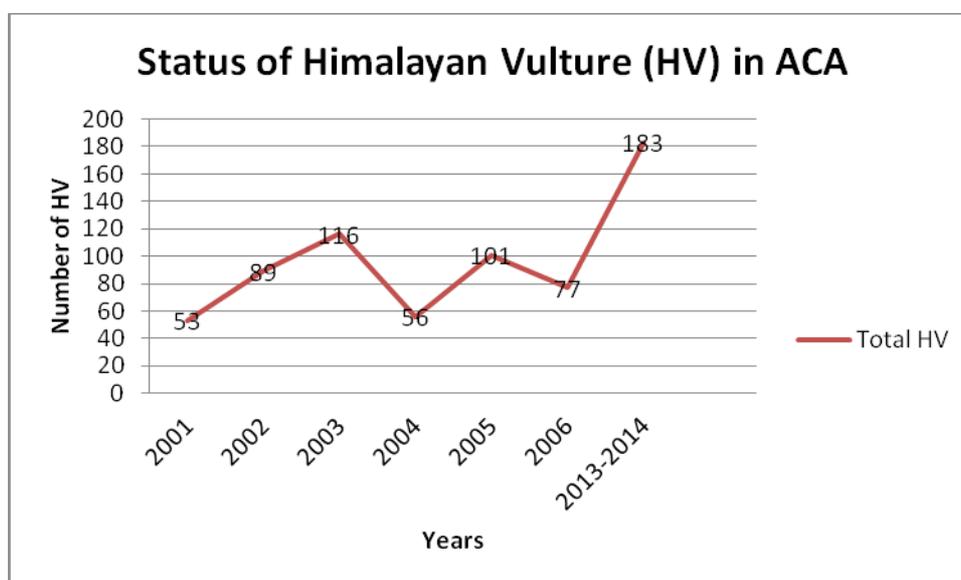
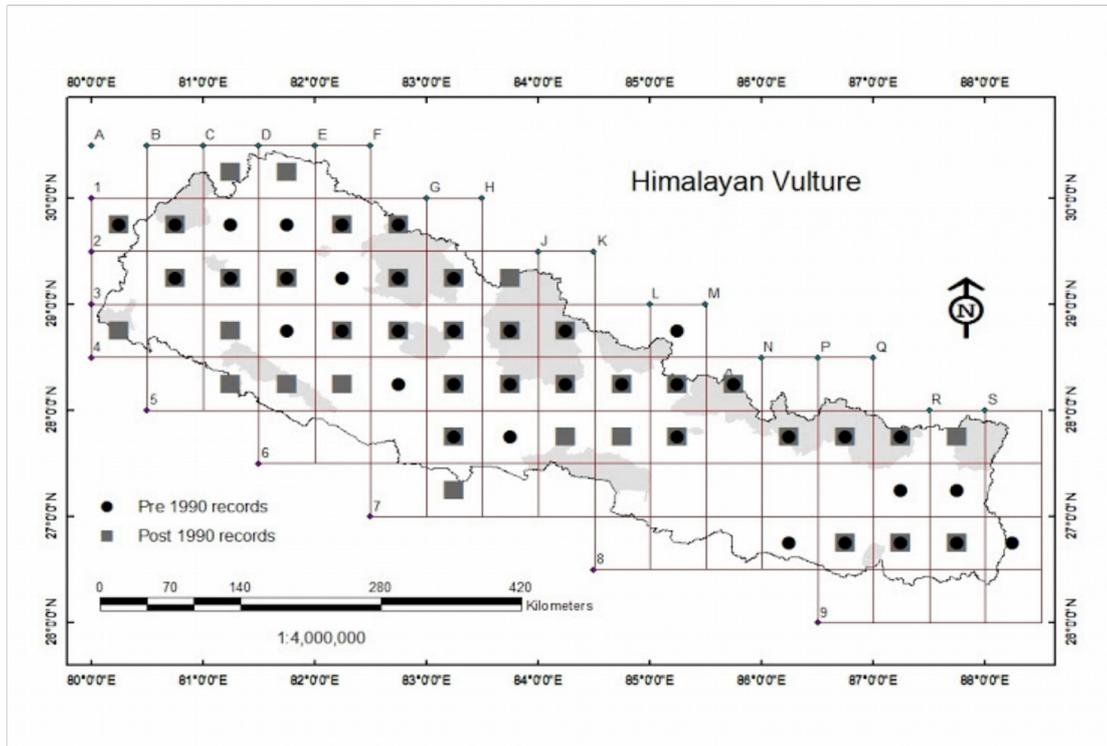


Fig. 1. Status of HV in ACA (Source: Virani et al 2008 and Karmacharya et al 2014.)



**Fig.2. Distribution of Himalayan Vultures in Nepal (Source: Himalayan Nature, Red data map)**

We recorded only four abandoned nests of HV. No occupied and productive nest of HV were recorded in 2013 count period but two productive nests of HV with fledged chicks were recorded near Pairothapla during 2014 count period. Two incubating nests of EV were also recorded near Tatopani.

We did not see any dead Vulture and livestock carcass during the survey period. No more stock of banned veterinary drug Diclofenac was observed in agro vet shops in the area due to extended survey of the drugs by local authorities

The absence of Diclofenac drug and increasing number of Vultures shows the area is now safe for the existing population with the implementation of this conservation project which was completed very successfully.

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## Snaps



Snap 1. Annapurna Conservation Area, Habitat of Himalayan Vulture



Snap 2. Participants in Diclofenac Free District Declaration program in Manang



Snap 3. Participants in Diclofenac Free District Declaration program in Mustang



Snap 4. Capacity building training on vulture conservation.



**Snap 5. Students focusing on outreach materials**



**Snap 6. Community outreach program**



Snap 7. HV with egg in nest



Snap 8. HVs in cliff