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VULTURE : *An Endangered Bird*

Photo : Rajat Bhargava

Status of Environment & Related Issues

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EDITORIAL

Since times, vultures being 'keystone' scavengers play a critical role in nutrient cycling as they are positioned at the top of the food chain. They play major role in disposing off the carcasses of dead animals, both wild and domestic, along with other scavengers such as jackals, hyenas, dogs, crows and kites. Their adapted lifestyles ensured that no decaying carcasses remained. Thus, the vultures are most recognized scavengers which have ecological, economic & cultural significance.

A decade ago, three species of South Asian vulture faced near-extinction because of widespread use of diclofenac to treat livestock, the carcasses of which were their main food source. According to the International Union for Conservation of Nature's (IUCN), 2015 Red List of threatened species, 9 species of vultures have been recorded from India. Out of these, 6 vulture species are threatened and further from these 6 Vulture species, 4 species are on the verge of global extinction. The near extinction species include, White-rumped/White backed Vulture (Gyps bengalensis), Long-billed Vulture/ Indian vulture (Gyps indicus), Red-headed vulture (Sarcogyps calvus) and Slender-billed Vulture (Gyps tenuirostris).

A serious decline in the population of the main species of vulture has led to a series of meetings and seminars internationally including India in order to address the need for vulture conservation. The major initiatives taken to conserve vultures in India are, ban on the veterinary use of diclofenac drug, establishing vulture conservation breeding centres and vulture safe zones. However, a lot more needs to be done to save the diminishing populations of vulture and which requires an integrated approach of conservation breeding, research, monitoring and public awareness.

The present issue is being published with as special focus on this magnificent bird, which not only fulfils a vital function in our ecosystem, but also a part of our culture. The article covers scientific classification, geographical range, phenotypic features, habits, ecological & cultural significance, present status & threats and initiatives being taken up for conservation of vultures throughout the world especially in India. It is hoped that information compiled in the newsletter will further enhance the knowledge of readers about vultures & motivate them to get involved in conservation, restoration and protection of vultures and their natural habitats.

Editors

ENVIS Centre, PSCST is a partner of Regional Centre of Expertise (RCE) Chandigarh. RCE Network is an initiative of United Nations University - Institute of Advanced Studies, Japan, which focuses on Education for Sustainable Development (ESD). This article on Vulture, the endangered bird endeavor to create awareness & motivation for conservation and preservation of this bird towards bio-diversity conservation initiatives for sustainable growth.

Introduction

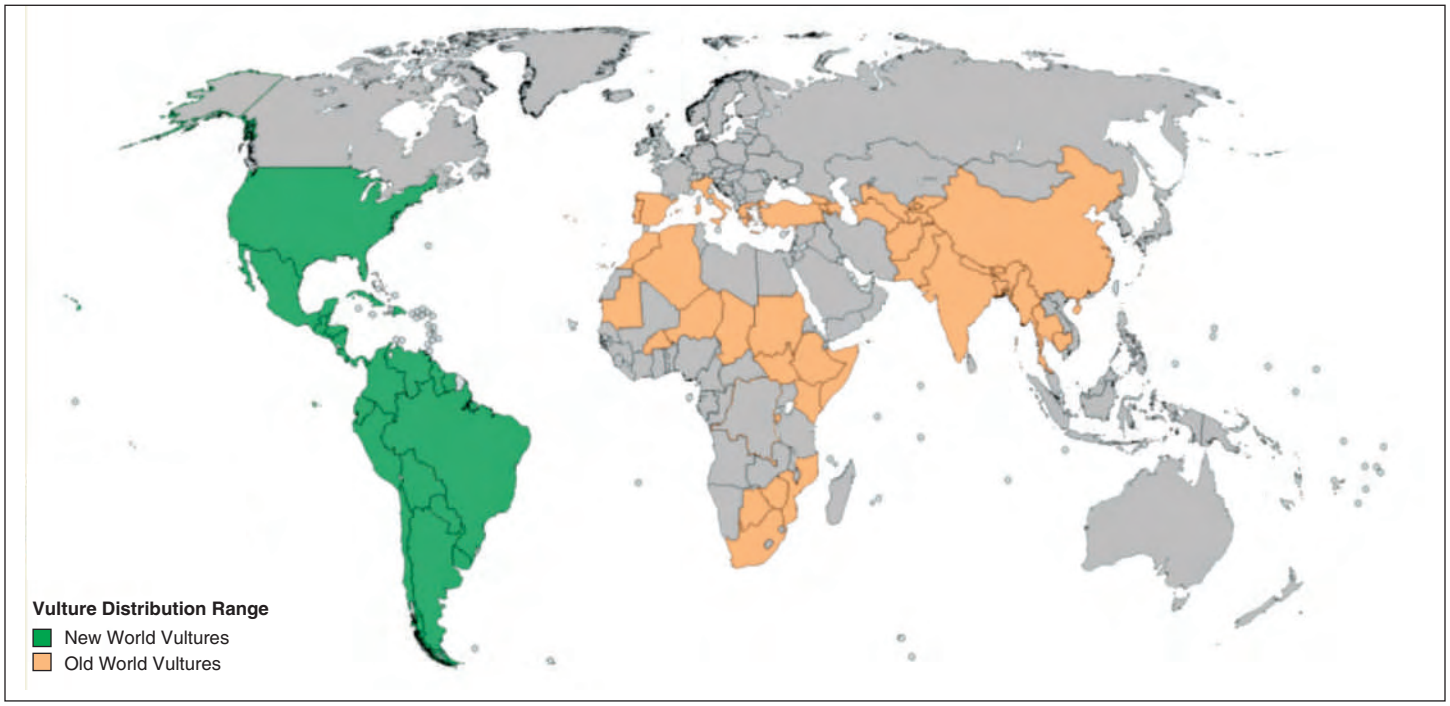
Our environment consists of biotic and abiotic components and the balance between them is vital for the subsistence of life and ecosystems on earth. Besides other plants and animals the large-size birds, such as vultures are also an essential component of the biotic system in the ecosystem. Vultures are often termed as Nature's guardians of cleanliness as for centuries they have been silently performing a very important task in the cycle of nature.

Vultures are often termed as birds of prey or raptors .The term "raptor" is derived from the Latin word ''rapere" (meaning to seize or take by force). These birds are typically large and robust in size characterized by keen vision that allows them to detect prey during flight, large wing span, powerful talons, sharp beaks and bald featherless head & neck. These birds of prey can be classified as diurnal (Vulture, Hawk, Eagle, Buzzards, Harriers, Falcons, Kites) and nocturnal (mainly Owls). The major types of raptors are given in Box 1 and Plate 1 & 2.

Indian White-backed Vulture with Eurasian griffon vulture

Vulture is widely distributed around the world on almost every continent except the Antarctic & Australia and islands that surround it (Map1). They inhabit open country, often roosting in groups on cliffs, in tall trees, or on the ground.

Map 1. Distribution Vulture around the World



Box 1. Major Types of Raptors

Classification - Kingdom: Animalia, Phylum: Chordata, Class: Aves

Raptors	Features
Order : Falconiformes (Diurnal Raptors)	
Family : Cathartidae (includes New World Vultures)	
Vulture	Vultures are large & robust birds with relatively weak legs & feet with blunt talons, powerful hooked bills and bald & featherless heads. They boast large wingspans.
Family : Accipitridae (includes Old World Vultures & other birds as under)	
Eagle	Eagles are differentiated from other broad-winged birds of prey mainly by their larger size, more powerful build, and heavier head and bill. Most eagles are larger than any other raptors apart from the vultures.
Hawk	They are mainly woodland birds that hunt by tearing away prey from hidden branches. They usually have long tails and high visual insight. Hawks are named among the most intelligent birds.
Harrier	They are birds of prey with a special facial disc of feathers round the eyes which helps it to locate prey in long graves / vegetation. It has long broad wings but light weight body.
Kite	Kites are raptors with long wings and weak legs which spend a great deal of time soaring. In general they will take live prey but mostly feed on carrion.
Buzzard	A medium to large bird of prey identified by its white iris to the eye and the white throat and dark stripe. They take crabs and fish from wetlands and can also take larger prey like rabbit, the Indian hare as their food.
Family : Sagittariidae	
Secretary bird	It is large (Eagle like), long legged (Crane liked) bird which has hooked beak and rounded wings. It is mostly terrestrial in nature. Tale has two elongated central feathers that extend beyond the feet during flight.
Order: Strigiformes (Nocturnal Raptors)	
Family : Falconidae	
Falcon	These birds have thin, pointed wings, which allow them to dive at extremely high speeds. Peregrine Falcons, the fastest birds on Earth, are said to have reached stoop speeds of up to 200 mph.
Caracaras	It has small size, long legs, reddish naked skin on the cheeks and throat. It is slow flying bird and dominates the other vultures during feeding. It is National bird of Mexico.
Family : Pandionidae	
Osprey	The Osprey is a medium large raptor which is a specialist fish-eater with a worldwide distribution.
Family : Tytonidae	
Barn owl	Medium Sized, pale coloured having long wings. It has most marked facial disk giving them a distinctive heart shaped look. It has strong hearing abilities.
Family : Strigidae	
Eared owl	It includes larger grouping of owls known as typical owls having ear-tufts with conspicuous iris colour.

Box 2 : Scientific Classification and Geographical Range of Old & New World Vultures

Classification	New World Vultures	Old World Vultures
Kingdom	Animalia	Animalia
Phylum	Chordata	Chordata
Class	Aves	Aves
Order	Falconiformes	Falconiformes
Family	Cathartidae	Accipitridae
Geographical Range	America	Africa, Asia, Europe

Vultures are classified into two groups: Old World Vultures and New World Vultures. The scientific classification of old world vultures and new world vultures is given in Box 2.

Although all vulture species are similar, these two groups actually belong to different families. There are sixteen (16) species of Old World vultures that inhabit Africa, Asia, and Europe which belong to the *Accipitridae* family and seven (7) species of New World Vultures (members of the *Cathartidae* family) can be found throughout the America. The Vultures found in India are Old world vultures.

Old World Vultures are closely related to eagles, kites, buzzards and hawks. They have feet like eagle and we can see through their nostrils. Vultures belonging to this family rely on excellent eyesight to locate dead and dying animals for food. However, New World vultures are considered to be related to storks and in contrast to the Old World species, they have an amazing sense of smell to locate food (unusual for raptors). They have the ability to find their food from several kilometres away. We cannot see through New world vulture's nostrils. New World vultures lack a syrinx and are nearly silent. They have typical vocalizations like grunts, hisses and similar sounds. All species of vultures are very intelligent (http://wildliferesearch.org).

Vulture : Some Interesting Features and Habits

- The vultures being powerful fliers (fly 60% of their lifetime) soar on thermals (air columns heated by solar radiation) while they look for food, but when they locate a carcass, they approach it quickly to begin feeding before other predators find it. If a carcass is too stiff for them to rip open, they wait for another predator to open the flesh before they feed, hence vultures are often seen in the company of other carrion-eating animals.

White backed vulture

- They built nest in trees like Banyan, Peepal, Neem, Pine, Oak and Semal.
- Vultures caw feed on rotting carcasses because their stomach acid is strong enough to kill life threatening bacteria in carcasses.
- Vultures often prey on extremely sick, wounded prey, when the food is scarce and there are no carcasses nearby.

White-backed vulture in Nest

Long-billed vultures on a hill

- Vultures have bare heads and often bare necks so that when they feed on rotting carcasses, bacteria and other parasites cannot burrow into their feathers to cause infections. This allows the birds to stay healthier while feeding on material that would easily infect other animals.
- Vultures do not carry prey back to their chicks (because of weak feet and legs) rather they gorge (eat a large quantity of it greedily until it cannot eat anymore) at a carcass and regurgitate (bring swallowed food up again to the mouth) food from their crop to feed their young ones.
- A vulture can eat up to 1 kilogram i.e. about 2 pounds in a single meal i.e. over 10% of their body weight and then can remain without food for 15-20 days.
- When threatened, vultures vomit to lighten their body weight so they can escape more easily into flight. Vomiting also serves as a defence mechanism to deter predators that may be threatening the birds.
- Vultures urinate on their legs and feet to help cool off on hot days(often termed as urohidrosis) and their urine also helps kill any bacteria or parasites they've picked up from walking through carcasses to help keep the birds healthier.
- They are social animals, a groups of vultures are often seen circling prey from the sky above. This movement of the vultures is called a “Kettle” and a group of vultures resting together on tree is known as a “Venue” (or Committee or Volt). The group of vultures feeding together is termed as “Wake”.
- It can soar to the height of 7000 feet high and swiftly covers distances of 100 km.
- Vultures can live to be 70 years old and the male & female are monogamous. The males assist the females in incubating the eggs and caring for the chicks. Vultures mostly lay one egg every year in January.

Juvenile of White rumped vulture

- If the egg is destroyed due to natural reasons Vulture destroys its nest too.
- Most of the Vultures can mate throughout their life.
- Relationship between Lion and Vulture is the best example of Commensalism (where one organism benefits from the other without affecting it). Once the lion has finished its meal, the vulture swoops down and finishes off the carcass. The lion is not affected by this while the vulture gets to eat.
- Vultures have a very interesting relationship with Hyenas. They follow vultures to know the presence of carcass in forest.

Ecological Significance of Vulture

Vultures as scavengers have an important ecological role by maintaining equilibrium in the ecosystem. The necrophagous (feeding on carrion/ decaying flesh of dead animals or corpses) behaviour of vultures is repulsive but they act as environmental cleansers and reduce the risk of contamination by pathogens by quickly consuming decomposing carcasses.

- Vultures remove animal waste like carcasses of livestock & wild animals and carrion from the environment that would otherwise rot and spread disease such as anthrax and rabies.
- Vultures control the populations of disease-carrying scavengers such as feral dogs and rats.

Cultural Significance of Vultures

Vulture has been revered in most ancient civilizations due to their associations with different cultures as under

- The Egyptian vulture was most sacred to the ancient Egyptians.
- The vultures have cultural association with the country's Parsis (Zoroastrians) whose religion demands that they leave the bodies of their dead above ground, to be picked clean by the birds (Box 3). Parsis also believe that the vultures help release the spirit or soul of the dead.
- In India, epic Ramayana in hindu religion has signifies of vulture (Gidh/ Grudhaha) and the bird is also depicted as the vehicle of Ketu, considered as the planet controlling deeds of a person (www. ecoheritage.cpreec.org).

Adult White backed vulture feeding on carcass

Box 3 : Vulture and its association with Parsis

According to Parsi "The vulture, the first scavenger of the world should be brought back for a sustained ecological balance." The Parsis, who fled Persia –the present day Iran — centuries back and made India their permanent homeland, practice the religion of Zoroastrianism. About 100,000 live in major cities like Mumbai, Hyderabad and Kolkata. According to their religious practice, the dead bodies cannot be buried or burnt because the corpses could pollute the *Panchabhootam* (earth, water, air, ether and fire). Hence their bodies are left in a high-rise 'Tower of Silence *(dokhma)'* to be consumed by the scavengers.

The dokhma, usually built on a hilltop, is a round stone or brick structure about 15 meters high and perhaps 100 meters across, with an internal platform on which sit three ranks of stone slabs, for the bodies of men, women, and children, sloping down toward a central dry well. The bearers place a body there and within an hour or so vultures reduce it to bones. Some days later the corpse bearers return and throw the bones down the central well. It has sand and charcoal in it, the purpose of the charcoal being to protect the earth from the pollution of death.

Source: http://www.asiasentinel.com

Species Distribution & Population Decline

About thirty years ago, among raptors vultures and eagles were the most abundant birds of prey.

Table1. Old World Vulture and their Conservation Status (Family : Acciptridae)

Name of Species	Conservation Status
Cinereous vulture *(Aegypius monachus)*	NT
Griffon vulture (*Gyps fulvus)**	LC
White-rumped vulture *(Gyps bengalensis)**	CR
Rueppell's vulture *(Gyps rueppelli)*	NT
Indian vulture *(Gyps indicus)**	CR
Slender-billed vulture *(Gyps tenuirostris)**	CR
Himalayan vulture *(Gyps himalayensis)**	LC
White-backed vulture *(Gyps africanus)*	NT
Cape vulture *(Gyps coprotheres)*	VU
Hooded vulture *(Necrosyrtes monachus)**	EN
Red-headed vulture *(Sarcogyps calvus)**	CR
Lappet-faced vulture *(Torgos tracheliotus)*	VU
White-headed vulture *(Trigonoceps occipitalis)*	VU
Lammergeier vulture or bearded vulture *(Gypaetus barbatus)**	LC
Egyptian vulture *(Neophron percnopterus)**	EN
Palm-nut vulture *(Gypohierax angolensis)*	LC

LC- Least Concern, EN- Endangered, CR-Critical, NT-Near Threatened, VU- Vulnerable

***Vulture species found in India**

Source: IUCN, 2015.

However, during the 20th Century the vulture population had a sudden decline.

There are 23 vulture species in the world (16 Old world vulture and 7 New world vulture species) as shown in Table 1 & 2. Though vultures are relatively adaptable birds found in a range of habitats, including suburban regions, but 14 species are considered either threatened or endangered (Table 1 & 2).

From India, nine species of vultures have been documented of which five belong to the genus *Gyps* (Prakash 1999). Six *Gyps* vultures, namely the Oriental White-rumped vulture *(Gyps bengalensis)*, Long-billed vulture *(Gyps indicus)* and Slender-billed vulture *(Gyps tenuirostris)*, Egyptian vulture *(Neophron percnopterus)* Lammergeier vulture or bearded vulture *(Gypaetus barbatus)* and Red-headed vulture *(Sarcogyps calvus)* are resident species. The remaining three namely, Eurasian griffon *(Gyps*

Table 2: New World Vulture and their Conservation Status (Family: Cathartidae)

New World vultures	Conservation Status
Black vulture *(Coragyps atratus)*	LC
Turkey vulture *(Cathartes aura)*	LC
Lesser yellow-headed vulture *(Cathartes burrovianus)*	LC
Greater yellow-headed vulture *(Cathartes melambrotus)*	LC
California condor *(Gymnogyps californianus)*	CR
Andean condor *(Vultur gryphus)*	NT
King vulture *(Sarcoramphus papa)*	LC

LC- Least Concern, EN- Endangered, CR-Critical, NT-Near Threatened, VU- Vulnerable

Source: IUCN, 2015.

IUCN Red List Critically Threatened Vulture Species

Four species of vulture in Asia are now classified by the IUCN as Critically Endangered as under :

White-backed vulture or White-rumped vulture *(Gyps bengalensis)*

Indian vulture / Long-billed vulture *(Gyps indicus)*

Slender-billed vulture *(Gyps tenuirostris)*

Red-headed Vulture or King vulture *(Sarcogyps calvus)*

fulvus), Cinereous vulture *(Aegypius monachus)* and Himalayan *Griffon (Gyps himalayensis)* are largely migratory species (Prakash *et al. 2003, 2007).*

Out of nine species in India, six vulture species are threatened and further, out of these four species are under the high risk of global extinction. As per IUCN Red data list 2015, four vulture species namely, the Oriental White-rumped vulture *(Gyps bengalensis)*, Long-billed vulture/ Indian vulture *(Gyps indicus),* Red-headed vulture *(Sarcogyps calvus)* and Slender-billed vulture *(Gyps tenuirostris)* are critically endangered. The Egyptian vulture *(Neophron percnopterus),* & Hooded vulture *(Necrosyrtes monachus)* have been categorized as endangered. The three species namely, Griffon vulture (*Gyps fulvus*), Himalayan vulture *(Gyps himalayensis)* and Lammergeier vulture or Bearded vulture *(Gypaetus barbatus)* have least concern status.

In 1980s, Indian/Oriental white-backed vulture was thought to be the most common large bird of prey in the world with a population of tens of millions (Houston, 1985 & Thakur *et al.,* 2012). However, during 20th century, Gyps vulture populations were reported to be declining slowly

in many parts of the world, but in India, Pakistan and Nepal large populations of Indian/Oriental white-backed) vulture and Long-billed vulture were reported till 1990's (Thakur *et al.,* 2012). The *Gyps* vulture densities in India were very high (due to large availability of carcases of domestic animals) in some regions that they were considered danger for aircrafts (Grubh *et al.,* 1990). During late 1990s i.e. between 1992 and 2007, a large-scale decline in vulture numbers was seen across Asia. The White-rumped Vulture *(Gyps bengalensis),* the Indian vulture *(Gyps indicus)* and the Slender-billed vulture *(Gyps tenuirostris)* suffered about 97% decline in population numbers.

Various newspapers had reported the declining trend of vulture population in Punjab during 1995 and it was cause of concern for Department of Forests and Wildlife Preservation, Department of Animal Husbandary and general public in Punjab(Singh, 2015). Later a major vulture population decline in India was reported by Bombay Natural History Society's (BNHS) Principal Biologist Dr Vibhu Prakash at Keolodeo National Park in India (Prakash *et al.* 2003).

Subsequently, these declines were found to be occurring throughout India, Pakistan and Nepal. Further, to study the problem the researchers from BNHS, Bird Conservation (Nepal) and Ornithological Society (Pakistan) and international researchers from the Royal Society for the Protection of Birds (UK), Zoological Society of London (UK) and the Peregrine Fund (USA) also joined in to account for speedy decline of vulture population @ 50% per year. (www.vulturerescue.org). As per personal communication with Dr. Vibhu Prakash the current vulture population in India is less than 1 lakh.

Causes & Effects of Vulture Population Decline

For several years, researchers struggled to understand the cause of the vulture deaths. The decline of vulture populations, the dead birds were tested for pesticides, herbicides, toxic heavy metals and other environmental pollutants. Though trace levels of some of these compounds were detected but in the majority of the vultures there were insufficient levels to cause physiological damage and there was no link between these compounds and the gout found in most dead birds. As a result, a strong hypothesis was put forth that a new infectious disease agent was responsible for these deaths of vultures. The various studies conducted in this regard are summarized below:

A dead vulture

Stray dogs eating a dead cow

In, India, Pakistan and Nepal, 284 post-mortems were carried out on vultures and gout was found in 84% of birds and they had extensive visceral gout (Oaks *et al.* 2004 & Shultz *et al.* 2004). Visceral gout is caused by a build up of uric acid in the body, which at very high levels crystallises in the body coating all internal organs in a white paste-like coating. The presence of visceral gout in vultures suggested that the cause of death was mostly related to kidney failure.

In 2003, the major finding was made by researchers working for the Ornithological Society of Pakistan, The Peregrine Fund, and led by Professor Lindsay Oaks from Washington State University, USA. It was found that the pain killers known as Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) had been linked to kidney failures and cases of visceral when some of these drugs were given to birds. The team carried out major research on vultures in Pakistan (Oaks *et al.* 2004).

However, in 2004, the results of above work were published in “Nature” which reported diclofenac (Box 4) as the main cause of the vulture declines (Oaks *et al.* 2004). The diclofenac drug was widely used across South Asia to treat livestock whose carcasses were consumed as food by Gyps vultures. Further, researches established the same correlation between gout and diclofenac in birds from India and Nepal (Shultz *et al.* 2004). The study in Journal of Veterinary Medicine reports that the toxicity testing of diclofenac in four species of *Gyps* vulture caused dose-dependent mortality(amount of diclofenac per kg weight) and identical clinical signs(visceral gout) to those found in carcasses of wild birds. In carcass dumps, it was observed that detectable diclofenac in 10.1% of 1848 domestic ungulate carcases was the important and only cause of vulture population decline. Other causes or hazards including food availability, loss of breeding habitat and disease did not have sufficient evidence (Cuthbert *et.al.,* 2009)

Box 4 : Diclofenac Drug

Diclofenac is a common anti-inflammatory drug administered to livestock. It is used to treat the symptoms of inflammations, fevers and/or pain associated with disease or wounds of live stock. The name "diclofenac" derives from its chemical name: 2-(2,6-dichloranilino) phenyl acetic acid. Diclofenac was originally developed by Ciba-Geigy (now Novartis) in 1973. It was first introduced in the UK in 1979.

It was widely used in India beginning in 1990s and had been associated with Vulture population decline. Vultures are supposed to have renal (kidney) failure, however toxicity may be due to direct inhibition of uric acid secretion and they got poisoned by the accumulated chemical, because they do not have a particular enzyme to break down diclofenac.

Source: SAVE, 2014 a & b

It was reported that most of the Oriental White-rumped and long-billed vultures found dead in the wild had suffered severe visceral gout (Prakash *et al.,* 2007). Further, the simulation modelling results indicated that less than one percent of the livestock carcasses eaten by vultures need to contain levels of diclofenac lethal to vultures to cause the recorded rates of vulture populations decline across the India (Thakur *et al.,* 2012). The other vulture-toxic Nonsteroidal anti-inflammatory drugs (NSAIDs) reported were

Vultures & Crows feeding on carcass

aceclofenac (Sharma, 2012) and Ketoprofen (Naidoo *et al.,* 2010).

In India, between 2005 to 2009, the number of vultures dying from diclofenac contamination reduced by more than two- thirds, according to a study published in an issue of the journal Philosophical Transactions of the Royal Society (B) on the risk and impacts of pharmaceuticals in the environment.

In 2006, the number of livestock carcasses found containing the drug has halved with the banning of the vulture-toxic veterinary drug in the country, However, experts say that by 2009 6% of carcasses were still contaminated with diclofenac, despite its ban for its use to treat livestock.

Scientists sampled thousands of cattle carcasses dumped in the open and therefore available to vultures throughout India between 2004 and 2010. They found that in 2009, the proportion of carcasses positive for diclofenac was 49% lower than four years earlier. Using these data, in conjunction with information on the concentration of the drug, scientists calculated that the probability per meal of a vulture being killed had fallen by 65% (www.save-vultures.org).

The decline in vulture population resulted effected directly affected the human life as under:

White-backed vulture feeding on carcass

- Feral dogs moved into carcass dumps increasing the spread of diseases such as rabies.
- Traditional sky burials of some Himalayan and Parsi communities cannot be carried out.
- Life became harder for local hide and bone-collectors relying on cleaned carcasses in order to earn a living. And many cattle owners had to pay to have livestock carcasses buried or burnt.
- After 2011, no sharp decline in vulture population has been observed, the reason being the overall population size has decreased (Prakash, 2015).

Vulture Conservation in India

During the end of year 1999, the Zoological Society of London (ZSL) was working closely with Bombay Natural History Society (BNHS) and the Royal Society for the Protection of Birds (RSPB) to examine the problem of vulture decline. After identification of problem , they started the conservation work including, organization of high-level advocacy programme to manufacture and use of veterinary diclofenac, setting up of captive breeding centres to establish a source of birds for reintroduction into the wild in future, monitoring level of diclofenac in cattle carcasses and identifying alternatives (only veterinary NSAID known to be 'vulture safe' is meloxicam) and reduce exposure of wild vultures to diclofenac contaminated food. (www.save-vultures.org)

In 2006, it was observed that with the banning of the vulture-toxic veterinary drug in India, the number of livestock carcasses found containing the drug has halved. However, as per experts till 2009, 6% of carcasses were still contaminated with diclofenac, despite its use to treat livestock now being illegal (www.save-vultures.org).

Further, according to a new study published in the journal Philosophical Transactions of the Royal Society (B) on the risk and impacts of pharmaceuticals in the environment it was reported that the number of vultures dying from diclofenac contamination in India has reduced by more than two thirds between 2005 and 2009.

BNHS has reported that the surveys have shown that there is a gradual decrease in the prevalence of diclofenac drug (i.e. from 11.1% in 2006 to 6% in 2011) in livestock carcasses since the government ban on veterinary diclofenac in 2006. Further, the results have also pointed that there has been an increase in use of meloxicam drug (considered vulture-safe drug) to treat livestock as an alternative to diclofenac. However, the study of toxicity of other NSAIDs on vultures has shown that apart from diclofenac, there are several other veterinary NSAIDs in use as well that must be checked. The drugs which have not been tested for their impact on vultures like nimesulide, are also available in the market. Further, other alternative drugs which are fatal for vultures are still being used and are not banned like Ketoprofen (http://bnhs.org).

In 2011, a consortium of organizations, the Saving Asia's Vultures from Extinction (SAVE) was established to prevent the extinction of Gyps vultures in South Asia (Box 5). A major step towards vulture conservation in South Asia was taken by the Governments of Bangladesh, India, Nepal and Pakistan adopting a Regional Declaration on the Conservation of South Asia's Critically Endangered Vulture Species, in New Delhi on 4th May, 2012. The Governments also pledged to develop and promote active partnerships amongst state, national and international organizations to further accelerate vulture conservation in the region. The vulture monitoring in India, Nepal, Pakistan and Bangladesh indicates that the population declines have slowed or reversed. In India the regular monitoring of vultures using the repeated surveys of road transect counts shows that the vulture declines have slowed or ceased (SAVE 2014b.).

Box 5. Saving Asia's Vultures from Extinction (SAVE)

In 2011, SAVE – Saving Asia's Vultures from Extinction – was established. SAVE is a partnership of organisations established to provide a strategic framework through which the vulture-diclofenac problem can be addressed across national boundaries. SAVE coordinates and provides technical advice for *in situ* and *ex situ* vulture recovery efforts across the countries where Asia's vultures range. Further, SAVE enhances promotion of and support for these efforts.

SAVE has following partners which may expand in future :

- Core Partners: Bird Conservation Nepal (Nepal), Bombay Natural History Society (India), International Centre for Birds of Prey (UK), National Trust for Nature Conservation (Nepal), Royal Society for the Protection of Birds (UK), World Wide Fund (Pakistan) and Bangladesh National Vulture Recovery Committee (BNVRC).
- Project Partner : Zoological Society of London (ZSL, UK), The Peregine Fund (USA), The Hawk Conservancy Trust (UK), Wild Life Conservation Society (USA), Birdlife International Cambodia.
- Research Partners : Indian Veterinary Research Institute (IVRI), Uttar Pradesh, India.
- Government Partners : Bangladesh Forest Department.
- Funding Partners / Supporting Partners (Major) : Darwin Initiative (UK), Haryana State Forest Department (India), Central Zoo Authority, MoEF&CC, (Government of India), SOS Initiative (IUCN, GEF & World Bank), Royal Society for the Protection of Birds & Rufford Foundation (UK) & Boehringer Ingelheim (Germany).

Source : www.save-vultures.org

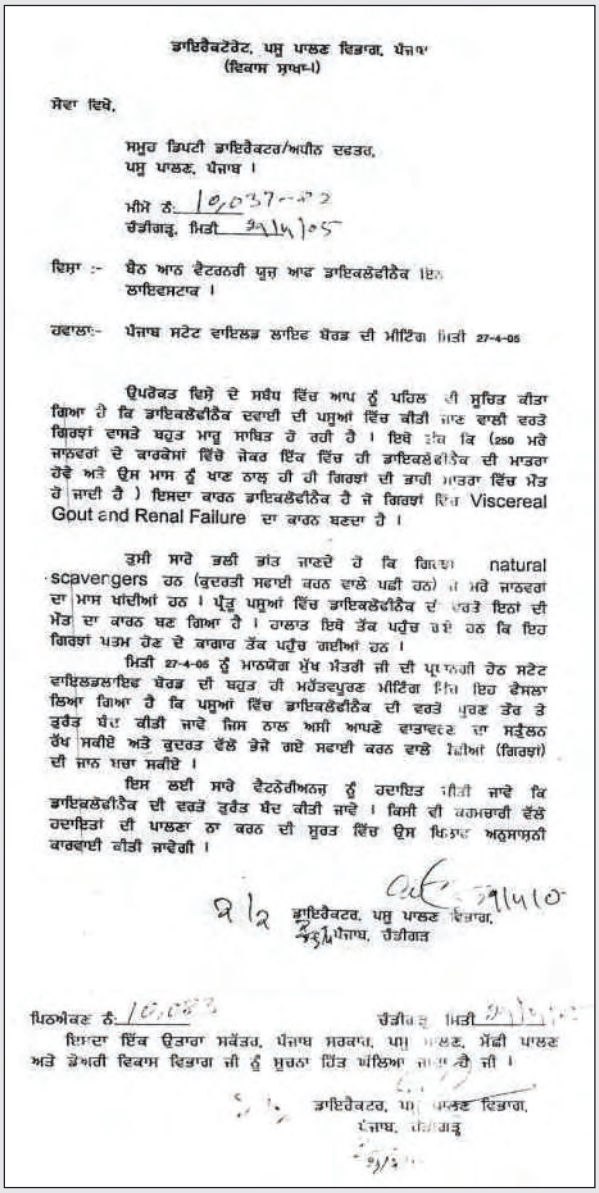
The SAVE consortium reports that the various conservation actions are undertaken with following achievements (SAVE, 2014b.):

- The veterinary use of diclofenac drug was banned in all vulture range states in the Indian subcontinent (Box 6).
- Regular monitoring of NSAID residues in cattle carcasses shows that the level of diclofenac contamination of the vulture food supply has fallen substantially.
- Identification of alternative drug to diclofenac like meloxicam available in Nepal & Bangladesh and monitoring of NSAID drug in cattle.
- Development of Vulture conservation areas or Safe Zones, which were pioneered in Nepal, are being introduced in other states, and expanded, tested, and developed.
- VSZ have been initiated at various places.
- The endangered 3 *Gyps* species being bred in captivity .
- In India, Nepal, Pakistan, Bangladesh and Kambodia regular monitoring of vulture shows vulture declines have slowed down.

Box 6 : Ban of Diclofenac in India and Punjab

The National Board for Wildlife, India in a meeting on March 17, 2005, recommended a ban on veterinary use of diclofenac. Further, the license to manufacture the drug diclofenac was withdrawn by the Drug Controller General of India vide letter dated May 11, 2006 addressed to all the State Drug Controllers (Prakash *et al.,* 2007). This directive was further strengthened in 2008, when the manufacture, sale or use of diclofenac for veterinary purposes was made an imprisonable offence.

The Punjab Government banned the use of Diclofenac for cattle w.r.t 29 April, 2005 to save the fast dwindling population of vultures in the region.



ਡਾਇਰੈਕਟੋਰੇਟ, ਪਸ਼ੂ ਪਾਲਣ ਵਿਭਾਗ, ਪੰਜਾਬ
(ਵਿਕਾਸ ਸ਼ਾਖਾ-I)

ਸੇਵਾ ਵਿਖੇ,

ਸਮੂਹ ਡਿਪਟੀ ਡਾਇਰੈਕਟਰ/ਅਧੀਨ ਦਫ਼ਤਰ,
ਪਸ਼ੂ ਪਾਲਣ, ਪੰਜਾਬ ।

ਮੀਮੋ ਨੰ: 10/037-42
ਚੰਡੀਗੜ੍ਹ, ਮਿਤੀ 29/4/05

ਵਿਸ਼ਾ :- ਬੈਨ ਆਨ ਵੈਟਰਨਰੀ ਯੂਜ਼ ਆਫ ਡਾਇਕਲੋਫੀਨੈਕ ਇੰਜ
ਲਾਇਵਸਟਾਕ ।

ਹਵਾਲਾ:- ਪੰਜਾਬ ਸਟੇਟ ਵਾਇਲਡ ਲਾਇਫ ਬੋਰਡ ਦੀ ਮੀਟਿੰਗ ਮਿਤੀ 27-4-05

ਉਪਰੋਕਤ ਵਿਸ਼ੇ ਦੇ ਸਬੰਧ ਵਿੱਚ ਆਪ ਨੂੰ ਪਹਿਲ ਹੀ ਸੂਚਿਤ ਕੀਤਾ ਗਿਆ ਹੈ ਕਿ ਡਾਇਕਲੋਫੀਨੈਕ ਦਵਾਈ ਦੀ ਪਸ਼ੂਆਂ ਵਿੱਚ ਕੀਤੀ ਜਾਣ ਵਾਲੀ ਵਰਤੋ ਗਿਰਝਾਂ ਵਾਸਤੇ ਬਹੁਤ ਮਾਰੂ ਸਾਬਿਤ ਹੋ ਰਹੀ ਹੈ । ਇਥੇ ਇਹ ਕਿ (250 ਮਰੇ ਜਾਨਵਰਾਂ ਦੇ ਕਾਰਕੇਸਾਂ ਵਿੱਚੋ ਜੇਕਰ ਇੱਕ ਵਿੱਚ ਹੀ ਡਾਇਕਲੋਫੀਨੈਕ ਦੀ ਮਾਤਰਾ ਹੋਵੇ ਅਤੇ ਉਸ ਮਾਸ ਨੂੰ ਖਾਣ ਨਾਲ ਹੀ ਹੀ ਗਿਰਝਾਂ ਦੀ ਭਾਰੀ ਮਾਤਰਾ ਵਿੱਚ ਮੌਤ ਹੋ ਜਾਦੀ ਹੈ) ਇਸਦਾ ਕਾਰਨ ਡਾਇਕਲੋਫੀਨੈਕ ਹੈ ਜੋ ਗਿਰਝਾਂ ਵਿੱਚ Viscereal Gout and Renal Failure ਦਾ ਕਾਰਨ ਬਣਦਾ ਹੈ ।

ਤੁਸੀ ਸਾਰੇ ਭਲੀ ਭਾਂਤ ਜਾਣਦੇ ਹੋ ਕਿ ਗਿਰਝਾਂ natural scavengers ਹਨ (ਕੁਦਰਤੀ ਸਫਾਈ ਕਰਨ ਵਾਲੇ ਪਛੀ ਹਨ) ਜੋ ਮਰੇ ਜਾਨਵਰਾਂ ਦਾ ਮਾਸ ਖਾਦੀਆਂ ਹਨ । ਪ੍ਰੰਤੂ ਪਸ਼ੂਆਂ ਵਿੱਚ ਡਾਇਕਲੋਫੀਨੈਕ ਦੀ ਵਰਤੋ ਇਨਾਂ ਦੀ ਮੌਤ ਦਾ ਕਾਰਨ ਬਣ ਗਿਆ ਹੈ । ਹਾਲਾਤ ਇਥੇ ਤੱਕ ਪਹੁੰਚ ਗਏ ਹਨ ਕਿ ਇਹ ਗਿਰਝਾਂ ਖਤਮ ਹੋਣ ਦੇ ਕਗਾਰ ਤੱਕ ਪਹੁੰਚ ਗਈਆਂ ਹਨ ।

ਮਿਤੀ 27-4-05 ਨੂੰ ਮਾਨਯੋਗ ਮੁੱਖ ਮੰਤਰੀ ਜੀ ਦੀ ਪ੍ਰਧਾਨਗੀ ਹੇਠ ਸਟੇਟ ਵਾਇਲਡਲਾਇਫ ਬੋਰਡ ਦੀ ਬਹੁਤ ਹੀ ਮਹੱਤਵਪੂਰਣ ਮੀਟਿੰਗ ਹੋਈ ਜਿਹ ਫੈਸਲਾ ਲਿਆ ਗਿਆ ਹੈ ਕਿ ਪਸ਼ੂਆਂ ਵਿੱਚ ਡਾਇਕਲੋਫੀਨੈਕ ਦੀ ਵਰਤੋ ਪੂਰਣ ਤੌਰ ਤੇ ਤੁਰੰਤ ਬੰਦ ਕੀਤੀ ਜਾਵੇ ਜਿਸ ਨਾਲ ਅਸੀ ਆਪਣੇ ਵਾਤਾਵਰਣ ਦਾ ਸੰਤੁਲਨ ਰੱਖ ਸਕੀਏ ਅਤੇ ਕੁਦਰਤ ਵੱਲੋ ਭੇਜੇ ਗਏ ਸਫਾਈ ਕਰਨ ਵਾਲੇ ਮਿੱਤਰਾਂ (ਗਿਰਝਾਂ) ਦੀ ਜਾਨ ਬਚਾ ਸਕੀਏ ।

ਇਸ ਲਈ ਸਾਰੇ ਵੈਟਨੇਰੀਅਨਜ਼ ਨੂੰ ਹਦਾਇਤ ਕੀਤੀ ਜਾਵੇ ਕਿ ਡਾਇਕਲੋਫੀਨੈਕ ਦੀ ਵਰਤੋ ਤੁਰੰਤ ਬੰਦ ਕੀਤੀ ਜਾਵੇ । ਕਿਸੀ ਵੀ ਕਰਮਚਾਰੀ ਵੱਲੋ ਹਦਾਇਤਾਂ ਦੀ ਪਾਲਣਾ ਨਾ ਕਰਨ ਦੀ ਸੂਰਤ ਵਿੱਚ ਉਸ ਖਿਲਾਫ ਅਨੁਸਾਸ਼ਨੀ ਕਾਰਵਾਈ ਕੀਤੀ ਜਾਵੇਗੀ ।

ਡਾਇਰੈਕਟਰ, ਪਸ਼ੂ ਪਾਲਣ ਵਿਭਾਗ,
ਪੰਜਾਬ, ਚੰਡੀਗੜ

ਪਿਠਅੰਕਣ ਨੰ: 10/037- ਚੰਡੀਗੜ੍ਹ ਮਿਤੀ
ਇਸਦਾ ਇੱਕ ਉਤਾਰਾ ਸਕੱਤਰ, ਪੰਜਾਬ ਸਰਕਾਰ, ਪਸ਼ੂ ਪਾਲਣ, ਮੱਛੀ ਪਾਲਣ ਅਤੇ ਡੇਅਰੀ ਵਿਕਾਸ ਵਿਭਾਗ ਜੀ ਨੂੰ ਸੂਚਨਾ ਹਿੱਤ ਭੇਜਿਆ ਜਾਂਦਾ ਹੈ ਜੀ ।

ਡਾਇਰੈਕਟਰ, ਪਸ਼ੂ ਪਾਲਣ ਵਿਭਾਗ,
ਪੰਜਾਬ, ਚੰਡੀਗੜ

Source: SAVE, 2014 a& b and Tiwana et al., 2007

Vulture Conservation Breeding Centres and Vulture Safe Zones

In India, BNHS initiated the movement of vulture conservation highlighting the issue of vulture decline and to save vultures from extinction through an integrated approach of conservation breeding, research, monitoring, public awareness, advocacy for policy interventions, etc. *In situ* and *ex situ* conservation initiatives have been taken by BNHS in India (Map 2).

The *ex situ* conservation of vulture has been started by establishing Vulture Conservation Breeding Centres (VCBCs) to save the threatened species from extinction. In total there are 8 VCBCs within the country which have been set up by the Central Zoo Authority (CZA) along with the state governments and with technical support from BNHS. The first South Asia's VCBC was set up in 2004 in Pinjore, Haryana to study byps species and later three more VCBCs were set up in Assam (Rani), West Bengal (Rajabhatkawa) and Madhya Pradesh (Van Vihar National Park, Bhopal). The other four VCBCs are in Andhra Pradesh (Nehru Zoological Park, Hyderabad), Odhisa (Nanankanan Zoo, Bhubaneshwar), Jharkhand (Mutta Zoo, Ranchi) and Gujrat (Sakkarbaug Zoo, Junagarh) (Bonal & Prakash, 2014 and Prakash, 2015).

The VCBC has enclosures called aviaries of different types for breeding, nursing, looking after sick/injured vultures and artificial incubation of vulture eggs and rearing of vultures (http://bnhs.org). A working manual on the conservation breeding programme has been produced. The release programme is expected to begin in 2017 in the Vulture Safe Zones established by *In situ* efforts.

In India, the *In situ* conservation is being undertaken in the Vulture Safe Zone (VSZ). VSZ consists of natural habitat of wild vultures with availability of diclofenac free animal carcasses (the major food of vultures) within atleast 100 Km radius. VSZ has two conservation purposes:

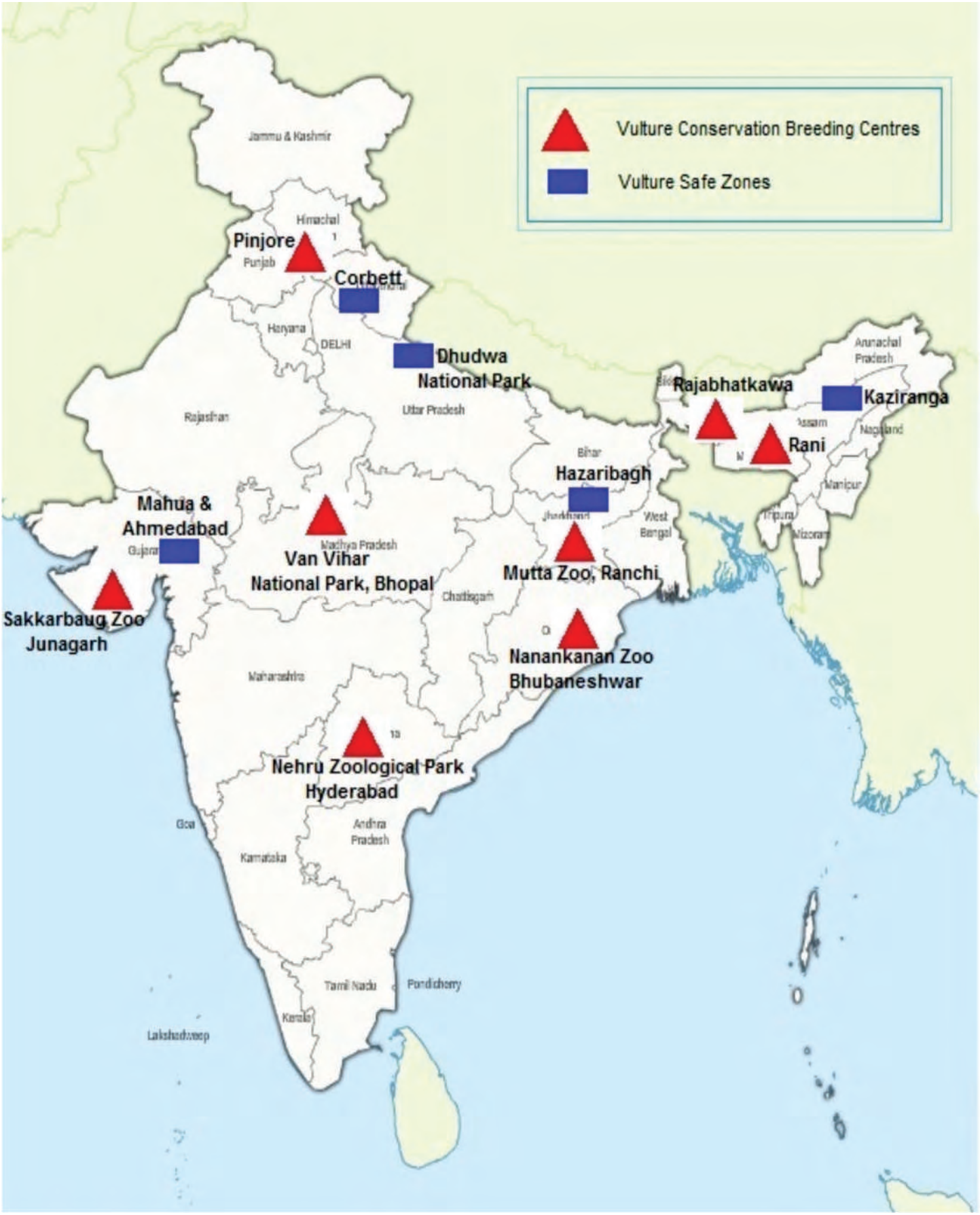
- At key geographical areas: to protect and increase remaining vultures.
- For populations' captive-bred vultures: to act as future release sites.

With concerted efforts of BNHS, currently five states–Gujarat (Mahua and Ahmedabad), Jharkhand (Hazaribagh), Uttarakhand (Corbett), Uttar Pradesh (Dhudwa National Park) and Assam(Kaziranga) have declared VSZs across seven locations. Insitu conservation efforts of BNHS have led to stabilisation of vulture population in designated VSZs in Gujarat and Jharkhand and increase in vulture population in the VSZ in Uttarakhand in recent years (http://bnhs.org). VCBCs and VSZ located in India are shown in Map 2.

Colony Aviary at VCBC, Pinjore

Nursery Aviary at VCBC, Pinjore

Map 2. Vulture Conservation Breeding Centers & Vulture Safe Zones in India



Long-billed vultures (3 years old) in Holding Aviary at VCBC, Pinjore

Long-billed vulture (80 days old) nestling at VCBC, Pinjore

Further, various nation-wide researches are being conducted like transect surveys, surveys in national parks, vulture nesting colonies, pharmacy surveys to study the use of toxic veterinary drugs beyond VSZs and recovery of vulture carcasses for further lab investigations. The nation-wide road transect survey of vultures is undertaken every four years to record number of birds observed along these roads across rural India, within and near national parks and other protected areas by BNHS.

Vulture Conservation Initiatives in Punjab

To conserve vulture population, the Punjab Government banned the use of Diclofenac for cattle in 2005 (refer Box 5). During 2008-09 and 2010-11, Ministry of Environment, Forest and Climate Change supported the Vulture conservation activities under the 'Recovery Programme for Critically endangered Vulture species and habitats in Punjab' along with other two states of Haryana and Gujarat.

The Department of Forests and Wildlife Preservation, Punjab in collaboration with BHNS undertook rigorous activities like awareness workshops, showcasing documentary, puppetry shows and field visits to Vulture feeding sites during the above mentioned period i.e. 2009-2011 (Singh, 2015).

In order to provide the vultures a meal that is free from chemicals, 3 vulture restaurants were set up in Punjab (and 1 in Maharashtra). The vulture restaurants were at three strategic places near rivers (Ravi and Chaki) namely Kathlore, Chandola and Chamraur. These locations have been chosen to not only be a good feeding ground but provide vultures place to nest and breed. It has also been taken into consideration that there is ample water in the neighbourhood. The Wildlife Department provided carcasses of dead buffaloes, cow and bulls from villagers' everyday and place them on bricked platforms with boundary walls that serve as the vulture restaurants. The forest officers test for the safety of the carcasses before they are fed to the vultures.

During this period the four vulture species, including the Griffon Vulture and the Himalayan Vulture have been sighted more than 300 times by the Pathankot Wildlife Division, which has provided medically tested safe carcass.

The Vulture population showed positive results as the number of vultures grew to 700-800 in the area. Further, this increase in Vulture population

Vultures at Dhar Block, Punjab

Vulture Observation by Students during Nature Camp

also gave a way to enhance the Vulture numbers in surrounding states.

Punjab State Council for Science & Technology under "National Nature Camp Scheme" organized a special session on vultures for Eco-club students (under National Green Corps Programme) of Hoshiarpur district during May 2014. About 150 students & teachers participated in the sessions and were taken for field visit to observe them at vulture restaurant.

Though previously some Vulture conservation related actions have been taken in Punjab but presently there is an urgent need to catalyse and to take up new initiatives/activities within the state to preserve this critically endangered bird. The white backed vulture *(Gyps bengalensis)* has been notified on the verge of extinction as per notification of Ministry of Environment, Forests & Climate Change, Govt. of India (No. S.O. 492(E) dated 4th February, 2014). The collection of the white backed vulture *(Gyps bengalensis)* is prohibited, except with the approval of the Punjab Biodiversity Board for the purposes namely, scientific research, herbarium & museum of scientific and academic institutions, propagation and other any other scientific investigation.

Way forward

As per “A Blueprint for the Recovery of South Asia's critically Endangered Gyps Vultures” published in MISNET (Vol. 15, No. 3 July 2014) the serious concerns that still remain about vultures are mainly, the small vulture populations and their vulnerability to adverse events, less availability of carrion (the major food of vulture) due to changed way of disposal of carrion like burring, increased predators, increased use of other harmful drugs (like Ketofenac & Aceclofenac), efficient regulatory mechanism to regulate the harmful drugs and disturbance to vulture nests (like due to tree felling). However, it suggests action timelines covering the period upto 2025 to support large and self-sustaining vulture populations and this would be possible only if the partnerships among conservationists, government /non-government agencies and pharmaceutical agencies are strengthened. A major step for the future of vultures in India has just been announced on the Ministry of Health website, posting the gazetted notification restricting human formulations of injectable diclofenac to 'single unit dose pack only' (i.e. 3 ml). The multidosage i.e. 30 ml is banned. The notification takes immediate effect (dated 17 July 2015) and it is hoped that this step will make illegal veterinary use more difficult and the continuous monitoring would handle the vulture decline problem.

MAJOR TYPES OF RAPTORS

Plate-1

Vulture

Eagle

Hawk

Harrier

Kite

Buzzard

Secretary Bird

Falcon

Caracaras

Osprey

Barn Owl

Eared Owl

Source : www.walkthroughindia.com & www.raptorsresearchfoundation.org

Long billed vulture at VCBC, Pinjore

General Vulture Facts

Diet	Carnivore & Scavenger
Size	47–122 cm
Wing Span	1.7 m (5.6 feet) to 2.8 m (9.5 feet)
Soar	4,500 m to 11,300 m
Weight	1.5 kg – 15 kg
Top Speed	50-55km/h (but can reach upto 90 km/h)
Life Span	38 years (in captivity) & about 70 years (in wild)
Lifestyle	Social (moves in flocks)

MAGNIFICENT VULTURES IN THE WORLD

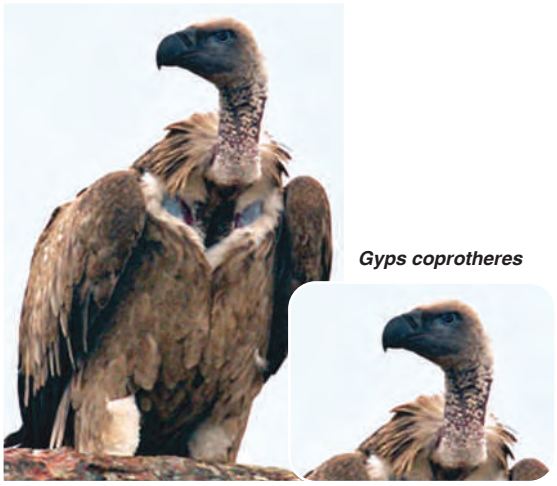
OLD WORLD VULTURES

Bearded vulture / Lammergeier

Gypaetus barbatus

- Found in high mountainous regions of Europe, India and Tibet.
- Unlike most vultures, the bearded vulture does not have a bald head which is relatively small & feet are large and powerful.
- It has reddish yellow or white plumage on the head and breast with a grey black tail and wings. In the adult individual the black strip over the eyes and the bristles at the base of the beak form the distinctive appearance of a beard.
- This is the only living bird species that specializes in feeding on marrow.

Cape vulture / Cape griffon / Kolbe's vulture


Gyps coprotheres

- It is found in Southern Africa. Roosts and nests mainly on large cliffs in mountainous or hilly country.
- This large vulture is dark brown except for the pale wing coverts.
- The head and the neck are covered with sparse white down. Bare skin is bluish. The neck-ruff is pale greyish buff. Upperparts of the body and wings are pale buff or stone colour which contrasts with dark spots along trailing edge of the wing-coverts and dark flight-feathers.
- The two prominent bare skin patches at the base of the neck, also found in the white-backed vulture, are thought to be temperature sensors and used for detecting the presence of thermals.

Cinereous vulture / Eurasion black vulture

Aegypius monachus

- Large raptorial bird that is distributed through parts of Eurasia.
- It inhabits hilly, mountainous areas, especially favoring dry semi-open habitats. Found in undisturbed, remote areas with limited human disturbance.
- It is the largest vulture in old world vultures & is believed to be the largest true bird of prey in the world.
- It has distinctly dark, body brown with pale head covered in fine blackish down. The skin of the head and neck is bluish-gray and a paler whitish color above the eye. From a distance, flying birds can easily appear all black.

Egyptian vulture / White scavenger vulture / Pharaoh's chicken

Neophron percnopterus

- Found from south-western Europe and northern Africa to India.
- The contrasting underwing pattern and wedge-shaped tail make it distinctive in flight as it soars in thermals during the warmer parts of the day.
- Their plumage is all white or dusty colored, has bare face & has feathers on mane.
- The orange faces is believed to be due to its habit of eating mammalian feces which contains carotenids from carrots and shell fish.
- It is the smallest vulture amongst old world vultures.

Griffon vulture / Eurasian griffon

Gyps fulvus

- Found in southern Europe, north Africa, and Asia.
- Roosts and rests on large cliffs and soars over surrounding open countryside in search of food but avoids woodlands.
- It has a very white head, very broad wings and short tail feathers. It has a white neck ruff and yellow bill. The buff body and wing coverts contrast with the dark flight feathers.
- It has a weak beak so it is unable to break through the tough hide of a dead animal and wait for other species to open the carcass, or for the sun and time to soften the skin.

Himalayan vulture

Gyps himalayensis

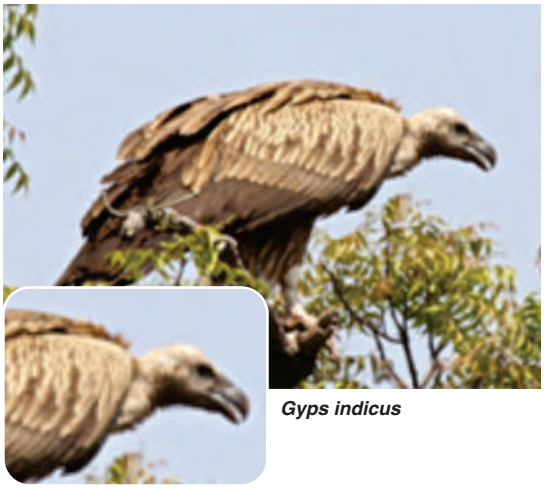
- It is found mainly in the higher regions of the Himalayas and in the Central Asian mountains. It may occasionally migrate to Northern India.
- The Himalayan Griffon Vulture is the largest of the genus Gyps and is considered to be the largest and heaviest bird found in the Himalayas.
- The body is whitish to creamy-white. The plumage and underparts are very pale, with white thighs and underwings, and creamy-white body. The ruff feathers are long and spiky. The head is covered in yellow down.
- This vulture is dominant at carcasses, except over *Aegypius monachus* which is almost as large as him.

Hooded vulture / Monk vulture

Necrosyrtes monachus

- It is common across sub-Saharan Africa. Habitats include open plains, savannas, forests, coastal areas and villages.
- The hooded vulture is the smallest vulture of crow size.
- It is a typical vulture, with a bald head that is usually white, but flushes red when agitated and a greyish “hood”.
- The common name of the bird is derived from the hood which is wool-like down that covers the lower throat and rear of the neck.
- It has broad wings for soaring and short tail feathers.

Indian vulture / Long-billed vulture



Gyps indicus

- It is found mainly in central and peninsular India. The species breeds mainly on cliffs
- Typical Gyps vulture. Robust, strong features giving eagle-like bearing. Perched adults have pale-yellowish bill, large white neck-ruff; and buff back.
- Its thighs are heavily feathered and not comparable with the rest of the underparts.
- It is distinguished from that species by its less buff body and wing coverts.
- Juveniles have a dark bill, pinkish head & neck with pale down and brown & cream streaked undersides.

Lappet faced vulture / Nubian vulture

Torgos tracheliotos

- Patchily distributed in Africa & prefers to live in dry savannahs. Resident in semi-deserts, open bush, or thorn scrub but prefers arid conditions.
- This is the largest African vulture and among the rarest of all vulture.
- It is easily identified by its bare pink head and large, fleshy lappets (folds of skin) on sides of its neck.
- The wings are very broad and designed to allow long periods of gliding and soaring without wasting energy in flapping.
- Of all the vultures the Lappet-faced have the most formidable bill.

Palm-nut vulture / Vulturine fish eagle

Gypohierax angolensis

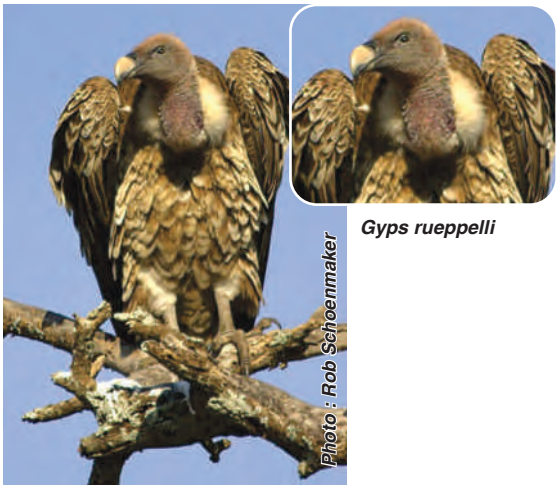
- It breeds in forest and savannah across sub-Saharan Africa, usually near water. It is most common in coastal forests and mangrove swamps.
- It is a large bird of prey but this is the smallest in Old World vultures.
- It is frugivorous, unusual habit for birds of prey. It feeds mainly on the fruit of the oil palm, though it also feeds on crabs, molluscs, locusts, fish and has been known to occasionally attack domestic poultry.
- Its plumage is all white except for black areas in its wings. It has a red patch around the eye.

Red-headed vulture / Asian king vulture / Indian black vulture / Pondicherry vulture

Sarcogyps calvus

- Found in the Indian subcontinent with small populations in some parts of Southeast Asia in open country & in cultivated & semi-desert areas.
- It is a sedentary bird and has a black body with pale grey band at the base of the flight feathers.
- It has a bare red head, neck and legs which has white thigh-patches and ruff.
- In overhead flight, the white breast, thigh patches and grey-white band along wings are distinctive.
- The species has experienced a dramatic decline in both population size and distribution. In India it has been estimated that the population decreased by over 90% in just 10 years.

Rüppell's vulture



Gyps rueppelli

- It is a large vulture that occurs throughout central and western Africa. They prefer grasslands and dry, arid areas where they can easily spot carrion.
- It is noticeably outsizing the closely related white-backed vulture, with which they often co-occur in the wild.
- It is mottled brown or black overall with a whitish-brown underbelly and thin, dirty-white fluff covering the head and neck. The base of the neck has a white collar, the eye is yellow or amber, the crop patch deep brown.
- They have backward-pointing spines on the tongue to help remove meat from bone.
- It is considered as the highest flying birds in world .

Slender-billed vulture

Gyps tenuirostris

- These vulture species are distributed in India, Nepal, Bangladesh, Cambodia, Laos and Myanmar.
- It inhabits dry open country, partly wooded country and forested areas usually away from human habitation.
- The slender-billed vulture is medium sized vulture.
- The head and neck are black and lack feathers. The neck skin is thickly creased and wrinkled. The bill is dark with pale culmen and black cere. The thin long bill and snake-like long neck are its distinguishing characters.
- In flight, the white downy thigh patches are distinctive.

White backed vulture / White rumped vulture

Gyps bengalensis

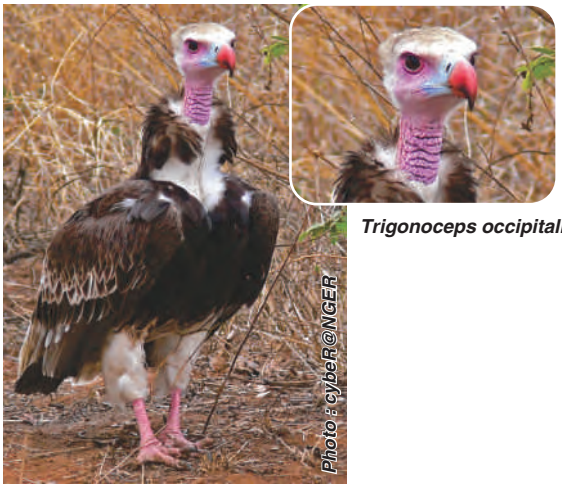
- Found in Southern and South-eastern Asia. It builds its nest on tall trees often near human habitations
- Medium-sized vulture, with an unfeathered head and neck, very broad wings, and short tail feathers. It has a white neck ruff.
- This is the smallest of the *Gyps* vultures, but is still a very large bird.
- Formerly described as the most abundant large bird of prey in the world, this species global population almost certainly numbered several million individuals. However, following dramatic declines through the 1990's across its range.

White backed vulture

Gyps africanus

- It is found in west and east Africa. It breeds in trees on the savannah.
- The white-backed vulture is a typical vulture, with only down feathers on the head and neck, very broad wings and short tail feathers. It has a white neck ruff. The adult's whitish back contrasts with the otherwise dark plumage.
- It is closely related to the European griffon vulture, G. fulvus. Sometimes it is called African white-backed vulture to distinguish it from the Oriental white-backed vulture.

White-headed vulture

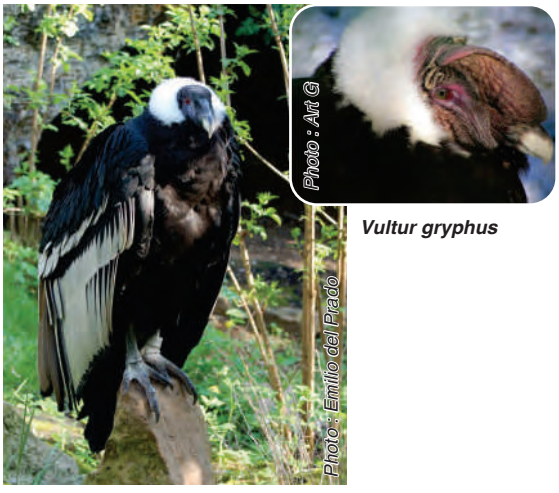


Trigonoceps occipitalis

- It is found in Asia, Africa and Europe mostly in dry regions, in open areas such as plains, even desert.
- It is a medium-sized vulture having bare, pink face and bright orange-red bill with a peacock blue base, has dark brown upper parts, black tail feathers, belly and thighs are white and its legs are pale pink.
- This vulture is usually the first to find a carcass, and to land and start feeding. It prefers to walk off with a piece and feed alone. However, it also hunts live prey to supplement its diet.
- It is able to eat any piece of carcass, except the skin, and include ligaments and bones, but they are "clean" feeders, without blood on their feathers.

NEW WORLD VULTURES

Andean condor



Vultur gryphus

- Found in the Andes mountains and adjacent Pacific coasts of western South America.
- It is large black vulture with a ruff of white feathers surrounding the base of the neck and especially in the male, large white patches on the wings.
- It is the largest vulture among the New world vultures.
- It has largest wingspan among birds.
- They are soarers rather than fliers.
- They are considered a symbol of power and health by Andean cultures, many of whom killed them for their bones and organs to use medicinally.

Black vulture / American black vulture

Coragyps atratus

- Found from the south-eastern United States to the middle of Central America in open areas within forested landscapes.
- Black vultures are large raptors but are the smallest amongst the New world vultures. It has sooty black plumage, a bare black head, and neat white stars under the wingtips.
- Their flight style is distinctive: strong wingbeats followed by short glides, giving them a batlike appearance.
- During the day, Black vultures soar in flocks, often with Turkey vultures and hawks.

California condor

Gymnogyps californianus

- Largest bird in North American & lives in rocky shrubland, coniferous forests, and oak savannas
- It has uniform black colour with large triangular patches or bands of white on the underside of the wings.
- The head is largely bald, with skin color ranging from grey on young birds to yellow and bright orange on breeding adults.
- Historically, the bird has associations with mythology and an important symbol to Native Americans. This bird takes on different roles in the story telling of the different tribes.

Greater yellow-headed vulture

Cathartes melambrotus

- Also known as the forest vulture and is found in the Amazon Basin of tropical South America.
- It has similar feeding habits as lesser yellow-headed vulture but is larger than the lesser yellow-headed vulture, with a longer, broader tail. The plumage is a dark, glossy black in contrast to the lesser yellow-headed vulture's browner plumage. Its legs are darker in color and its head is more yellow and less orange/pink than that of the lesser yellow-headed vulture.
- It roosts on high, exposed dead trees to observe surrounding terrain.

Lesser yellow-headed vulture

Cathartes burrovianus

- Found in Mexico, Central America, and South America in seasonally wet or flooded lowland grassland.
- Large bird, body plumage is black and head & neck, are featherless, are pale orange with red or blue areas.
- The lesser yellow-headed vulture feeds on carrion and locates carcasses by sight & by smell (rare in birds).
- It is dependent on larger vultures (like king vulture), to open the hides of larger animal carcasses as its bill is not strong enough to do this.
- This vulture rarely soars high in the air, preferring low altitudes.
- This bird is believed to be migratory in response to the changes in water level where it lives.

King vulture

Sarcoramphus papa

- Found in the lowland tropical forests of Central and South America .
- It is most colorful vulture & has a very noticeable yellow fleshy caruncle on its beak.
- It often makes the initial cut into a fresh carcass.
- It has association with Mayan Civilization (portrayed as a god with a human body and a bird head) & bird's blood and feathers were also used to cure diseases.
- It is a popular subject on the stamps of some countries like El Salvador in 1963, Belize in 1978, Guatemala in 1979, Honduras in 1997, Bolivia in 1998, and Nicaragua in 1999.

Turkey vulture / Turkey buzzard / Buzzard

Cathartes aura

- It inhabits from southern Canada to the southern most tip of South America in open and semi-open areas, including subtropical forests, shrublands, pastures, and deserts.
- It has bald red head and dark plumage like male wild turkey. It has longer, straighter wings and longer tails than Black Vultures. They hold their wings upward, in a V-shape, and don't angle them forward as much as Black Vultures.
- The turkey vulture does not kill live animals but will mix with flocks of black vultures and will scavenge what they leave behind.

Timeline: Major Milestones related to Vulture and its Conservation

1998	Anecdotal observations and counts of vultures at Keoladeo National Park indicated a decline in numbers in India.
1999	Decline in vultures numbers in India was matched by similar decline in Pakistan and Nepal
2000	Research into cause of the decline initiated in South Asia
2003	Nationwide surveys indicated vultures have declined by more than 90% in comparison to populations in the early 1990s but an abundance of carcasses and breeding habitat (large trees and cliffs) indicated that these factors were not important for the decline in numbers.
2004	• Asia's first Vulture Conservation Breeding Centre was set up at Pinjore, Haryana, India
	• International Workshop held at Parwanoo, Himachal Pradesh to develop a recovery plan for the vultures in South Asia i.e. White-backed Vulture, Slender billed Vulture and Long billed Vulture focusing on (i) veterinary drug use, (ii) monitoring and research, (iii) public awareness and training and (iv) population status
	• MOEF organised a National Workshop at New Delhi to prepare a National Action Plan for conservation of the three species of vultures.
	• International workshop at Kathmandu to work out an implementable action plan for phasing out the use of Diclofenac and simultaneous substitution with viable and effective alternates.
2005	Second Meeting of the National Board for Wildlife (NBWL) to identify specific measures for phased withdrawal of veterinary Diclofenac and its substitution with tested alternatives.
2006	• Manufacture and Importation of veterinary diclofenac banned.
	• International Conference on Vulture Conservation at New Delhi for exchange of information on the status of the vulture population in the Range countries of the region.
	• Safety testing on African and Asian vultures demonstrated that an alternative veterinary drug, Meloxicam, is safe for vultures and other scavenging birds as well as effective for treating livestock
2007	Repeat nationwide surveys of vultures across India confirmed the continued decline of vultures, with numbers of Oriental white-backed vultures reduced by 99.9% in comparison to 1992.
2008	• Vulture Conservation Breeding Centres breed its first two Oriental white-backed vultures.
	• Breeding activity commences at Breeding Centres in Assam and West Bengal
2009	Breeding Centres in India produced 3 White-backed vulture fledglings (young bird with recently acquired flight features) and two slender-billed vulture fledglings, the first time that this species had ever been bred in captivity.
2010	• The signs of decline in the use of veterinary diclofenac in India and Diclofenac levels in animal carcasses.
	• Successful fledging of three captive bred Long-billed vultures along with three more Slender-billed and four Oriental White backed vultures successfully demonstrated that all three species can be successfully bred at the Centres.

	• The Bombay Natural History Society agreed to establish Vulture Safe Zones in India with the help of local partners and the Royal Society for Protection of Birds (RSPB).
	• The UK Government's Darwin Initiative provided generous support to both *in situ* (Vulture Safe Zone) and *ex situ* (Vulture Conservation Breeding Centres) conservation action in India and Nepal through the RSPB.
2011	• SAVE (Saving Asia's Vultures from Extinction) is formed to bridge international boundaries, coordinate conservation action and enhance promotion and support for our cause.
	• Nov. 2011 marked the first SAVE meeting organised by BNHS in Pinjore, Haryana
	• A network of Provisional Vulture Safe Zones (PVSZs) develops in India. Teams meet to discuss best practice for conservation action within PVSZs.
2012	• A symposium to develop a regional response to vulture conservation bring the governments of Bangladesh, Indian, Nepal and Pakistan together and declared that they will work together to prevent the extinction of the three most threatened vultures in South Asia.
	• The IUCN, Central Zoo Authority (India) and Wildlife Institute of India started playing more active role in vulture conservation.
	• The first vulture safe zone workshop was held in Lucknow, Uttar Pradesh to raise the profile of vulture conservation work in UP.
2013	• South Asia's Vulture Conservation Regional Steering Committee meeting at New Delhi.
	• Vulture Restaurant established at Ramdhuni Community Forest, Mahendranagar, Sunsari, with joint effort from Himalayan Nature and Ramdhuni Community Forest.
2014	Workshop on Role of veterinary technicians and local community in vulture conservation organized by Himalayan Nature (NGO) at KoshiTappu Wildlife Reserve (KTWR) headquarter, Kusaha.

Source: MoEF, 2006, www.vulturerescue.org, www.save-vultures.org & http://bnhs.org

International Vulture Awareness Day

The International Vulture Awareness Day, is celebrated on the first Saturday of each September. The International Vulture Awareness Day has grown from Vulture Awareness Days run by the Birds of Prey Programme in South Africa and the Hawk Conservancy Trust in England, who decided to work together and expand the initiative into an international event.

It is now recognised that a co-ordinated international day publicises the ecologically vital group of these birds that face a range of threats in many areas that they occur and mark upon the need for conservation of vultures and highlight the important work being carried out by the world's vulture conservationists.

On the first Saturday in September, each participating organisation carry out their own activities that highlight vulture conservation and awareness.

Source: www.vultureday.org

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www.vultureday.org
International Vulture Day

http://www.vulturerescue.org
Vulture Rescue

www.walkthroughindia.com

Walkthrough India

www.wildliferesearch.org
Wildlife Research and Conservation

OTHER IMPORTANT WEB LINKS

www.allaboutbirds.org
The Cornell Lab of Ornithology: All About Birds

www.beautyofbirds.com
Avian Web, North America

www.birds.iitk.ac.in
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Kangra has India's largest Asian white-backed vultures

Dharamsala : Kangra district now has the highest population of Asian white-backed vulture in the country. The bird has been enlisted as a critically endangered species in the International Union for Conservation of Nature (IUCN) red list.

In 2004-05, the Wildlife Department of Himachal had recorded about 33 nests of white-backed vultures in Kangra district. In 2012-13, 273 nests were recorded.

It was estimated by the department that the population of the vultures would be around 1,100 in Kangra district, which is the highest in the country. This also indicates that while the population of the white-backed vultures is still in a critical state in the plains, it has bounced back in lower areas of Himachal. As per the estimate of wildlife officials, about 200 white-backed vultures are taking birth every year in the state.

Sources in the Wildlife Department said 44 breeding sites of the white-backed vultures had been recorded in the Shivalik Hills of Himachal, which is a very healthy sign for the survival of the critically endangered species. The pine forests in the Shivalik Hills are serving as a habitat for the white-backed vultures in the state. However, the habitat of the vultures also carries a threat for their survival.

The pine forests in Himachal are prone to forest fires as pine needles that deposit on the ground are highly inflammable. Almost every year, the pine forests catch fire, which besides destroying the forest wealth also destroys the habitat of the white-backed vultures.

The only conservation that the vultures need in the state is that the pine forests should be protected from forest fires. Regular removal of pine needles from the forest ground and some kind fire-fighting mechanism in the area can help reduce danger to the population of the white-backed vultures in Himachal.

The Wildlife Department has set a feeding station for white-backed vultures in the Nagrota Surian area of Kangra district. Dead stray animals are left in that feeding station after skinning.

SD Sharma, Chief Conservator, Wildlife, Dharamsala circle, said, "The white-backed vultures can scavenge on dead animals only if they are skinned. So we have hired a local cobbler to skin the animals. The feeding station of white-backed vultures has been barbed to protect competition to them from stray dogs. Stray dogs that have been increasing are posing serious competition to these vultures in wild."

DS Dadwal, Assistant Conservator, Wildlife, said, "We are going to carry out a fresh survey for assessing the population of the white-backed vultures in Kangra district."

The population of the Asian white-backed vultures crashed in North India and Pakistan bringing them to the category of critically endangered species.

The scientists later found that diclofenac, a medicine that was used in the treatment of domestic animals, was the basic reason for the decline in the population of the white-backed vultures. The use of diclofenac was banned for treatment of animals.

Source: 5th March 2015, The Tribune

Saving vultures the need of the hour: GADVASU expert

Ludhiana **:** In the last decade, vultures nearly vanished from India and now they are listed by World Conservation Union as 'critically endangered'. These views were expressed by Dr Kirti Dua, in-charge, Wildlife Centre of Guru Angad Dev Veterinary and Animal Sciences University (GADVASU) and professor Veterinary Medicine. He was discussing the matter in context with the World Earth Day.

He said vultures are magnificent birds as they not only fulfill a vital function in our ecosystem, but are a part of our culture. "The initial hypotheses for the

drastic decline in population were non-availability of food (dead livestock) as they were perhaps being removed for commercial purposes, or an unknown viral epidemic disease. But subsequently it was detected diclofenac; a frequently used painkiller in domestic animals, is the main and probably the only cause of the crash in vulture numbers across South Asia," he said.

He added that experiments have shown that captive vultures are highly susceptible to diclofenac, and are killed by kidney failure within a short time of feeding on the carcass of an animal treated with the normal veterinary dose. He said removal of a major scavenger from the ecosystem will affect the equilibrium between populations of other scavenging species and/or result in increase in putrefying carcasses. In some areas the population of feral dogs, being the main scavenging species in the absence of vultures, has been observed to have increased, resulting in disease risks for wildlife, livestock and humans like rabies, anthrax etc. The decline in vultures has also affected the traditional custom of the Parsis of placing their dead in the 'Towers of Silence' for vultures to feed upon, he said.

Removing diclofenac from the environment will allow the eventual recovery of vulture populations which, may, however, take several years. "The government has banned the use of this drug in domestic animals. Meloxicam is a safe alternative to the diclofenac," the expert added. In order to ensure vulture survival it is necessary to bring them into captivity for breeding purposes, he said.

Source: 25th April 2015, The Tribune

Vulture culture atop coconut palms sends bird numbers soaring

NAVI MUMBAI: Around 200 km south of Mumbai in the picturesque coastal town of Shrivardhan in Raigad district, a meticulous Vulture Conservation Centre is slowly but surely taking shape atop tall coconut trees.

Forest officials of Roha taluka informed that at present there are 30 nests of white backed and long billed vulture species at their Shrivardhan centre which was started around three years back with the sole purpose of increasing the vulture population.

"A few NGOs and bird experts are also helping us in this drive to increase the vulture numbers at Shrivardhan in Raigad. We are so far satisfied as the results are good," said the assistant conservator of forests (Roha range) Deepak Sawant.

The deputy conservator of forests, Vijay Suryawanshi, added that today Shrivardhan has the highest number of white backed vulture nests very close to human habitation, which is why they have also started `vulture eco-tourism' at the venue to further boost the drive.

Another vulture eco-tourism site has also been initiated at the Mhasala range along the Konkan belt.

Environmentalist and bird expert, Bhau Katdare, of Sahyadri Nisarg Mitra group, which is assisting the forest department, said: "The fact that vultures lay just one egg per year, a lot of care has to be taken to ensure that there are successful hatchings in every nest on the coconut trees. That is why, the locals are being paid a compensation amount of around Rs 500 per head so that they do not climb up these trees to pick the coconuts as that can disturb the birds."

Katdare added that the success of the Shrivardhan centre can be reviewed by the fact that only recently an entire colony of vultures shifted from their base in Ratnagiri to Shrivardhan due to the adequate food available here.

Around 100 white backed and long billed vultures are presently seen here.

Earlier this year, in January, the nature group along with the forest department had also hosted the `Jatayu Festival' at Shrivardhan so as to involve the locals, the municipality, schools and also the hotel owners to raise awareness about the importance of vultures in our biodiversity. In the mythology of Ramayan, the huge Jatayu bird which tried to stop

Ravana from abducting goddess Sita, was in fact a vulture species. Hence, the fest has been so named.

Experts at the Bombay Natural History Society (BNHS) informed that there was a drastic 99% drop in vulture numbers in India for a period of 20 years since 1998, which had set alarm bells clanging among ornithologists the world over.

Research later confirmed that the presence of the veterinary drug, Diclofenac, among the cattle carcasses was responsible for the death of vultures. This non-steroidal anti-inflammatory drug administered to cattle proves to be deadly to the birds if they try to ingest the drug laced carcass. That's why, experts had urged the government to ban this drug and instead recommend another anti-inflammatory compound which would not be as dangerous for the vulture species.

BNHS too has started vulture breeding centres in Haryana, Assam, West Bengal and Madhya Pradesh. Five other breeding centres are being managed by Central Zoo Authority (CZA).

The forest officials informed that the Pune based expert, Dr Satish Pande, of Ela Foundation, is also actively helping them for vulture breeding along the Konkan coast.

Source : 27th April 2015, The Times of India

Nature's scavengers' number on the rise

The number of vultures has shot up from 30 in 2004 to over 900 in 2013: Survey

Shimla : There has been a dramatic increase in the number of vultures in the past one decade with huge flocks of even 175 scavengers becoming a common sight.

Reason: These scavengers are feasting on diclofenac-free carcasses specially supplied at the feeding stations in Dehra area of Kangra.

It is due to the efforts made by the Wildlife Wing of the Forest Department that the number of vultures has shot up from a mere 30 in 2004 to over 900 in 2013 as per vulture survey undertaken by the authorities. The number of nests and fledglings has also risen from a mere 26 and 23 to 271 and 234, respectively, between 2004 and 2014.

The population of vultures considered as natural scavengers had plummeted drastically, largely due to overuse of an anti-inflammatory veterinary drug diclofenac, which the birds consume from the carcass. The in-situ conservation project was launched in Himachal in 2004 to save vultures from a possible extinction and banning the use of diclofenac by India, Pakistan and Nepal helped in this endeavour.

Tarun Shridhar, Additional Chief Secretary (Forest and Revenue), said: "We set up breeding and feeding points after marking the potential nesting sites concentrated in Parol, Salol, Chadevh, Daulatpur, and Mastgarh in Kangra as these areas have ample mother pine (chir) trees which vultures find the most suitable for setting up their nests."

The master birds are breeding in colonies of about three to 30 nests per colony with each breeding area spread over an area of five to 20 hectare.

He emphasised that the setting up of two feeding stations near Pong Dam and at Nagrota Suriyan and another recent addition at Jawali had helped in the rise of vulture population.

There is an arrangement with cobblers who bring the dead animal and skin them inside the feeding stations, which are enclosed with the help of interlinked fence to keep stray dogs away.

The Wildlife Department had initially set up a protected area of over 200 hectare for the protection of the oriental white backed vultures in Lunj area of Kangra.

Source: 18th June 2015, The Tribune

Vultures bred in captivity to be released this Dec

Chandigarh : After setting up the countries first vulture-breeding centre almost 10 years ago in Bir Shikargah Wildlife Sanctuary, the Haryana Wildlife Department is all set to reintroduce its first pair of

vultures, bred in captivity at Jatayu (vulture) Conservation Breeding Centre, Pinjore, in the wild this December.

Out of the eight states taht have set up vulture-breeding centres after the population of this majestic creature dwindled drastically in the mid 90's due to rampant use of diclofenac (a drug used in treating cattle), Haryana bred 215 vultures at the centre and now, will take lead to release the first pair to its natural habitat in the Morni Hills.

Initially, a pair of Himalayan Griffon vulture (in captivity for many years) would be released as surrogate in a pre-release programme. The pre-release will be done to ensure that captivity had not altered their behaviour and the birds were fit to be released.

To monitor their behaviour and area of operation in the wild within a radial distance of 100 km from the release aviary, the department will fit satellite transmitters on the birds.

For the pre-release of the birds, the department will set up a release-aviary in Badisher village in Morni Hills where the birds would be kept for two –three months. After the successful reintroduction of the Himalayan Griffon vultures, about 10 to 15 white-backed vultures would be released. The decision was taken in a meeting of the governing council of the Jatayu Conservation Breeding Centre, chaired by Amit Jha, Principal Secretary, Forest and Wildlife, Haryana, at Pinjore, on Tuesday.

Apart from the top brass of the Haryana Wildlife, Animal and Husbandry, Food and Drug Administration, Health and Family Welfare of Haryana government, and representatives of Ministry of Forest and Environment, Dr Vibhu Prakash, principal scientist from Bombay Natural History Society (BNHS), who is handling the project from the beginning and Chris Bowden, of The Royal Society for the Protection of Birds, UK, which is funding the vulture-breeding project, also attended the meeting.

Jha disclosed that a team comprising officials from the Forest, Wildlife, Animal Husbandry and Food and Drug Controller Department would be constituted for the evaluation of 100 km area covering Haryana, Himachal Pradesh, Punjab, Uttaranchal, Uttrakhand and Uttar Pradesh for the availability of food, habitat and prevalence of diclofenac and any other potential threat to vultures before their release.

Source: 25th June 2015, The Tribune

Punjab, Haryana to carve out Vulture Safe Zone

Chandigarh: Punjab and Haryana have decided to create a Vulture Safe Zone over 100 km radius where birds bred in captivity at country's first Jatayu (vulture) centre in the Bir Shikargah wildlife sanctuary in Pinjore will be released. The proposal aimed at preserving the dwindling species has been discussed by the two states and a formal notification is expected shortly.

Apart from a survey of the area for availability of food, the wildlife department concerned will ensure that there is no use of the already-banned drug diclofenac, which reaches vultures through animal carcasses. As per the plan, a dedicated team of experts and NGOs will be roped in to ensure safety of the birds once these are set free. The partners will assess the success of the project and any new threats

by monitoring the vulture population with the help of the locals.

"The Haryana wildlife department came up with the proposal so that two vultures (Himalayan griffons) could be released in their natural habitat but without the danger of banned drugs which led to their near extinction," said Dharinder Singh, chief wildlife warden, Punjab.

Madhya Pradesh has already decided to come up with a safe zone in the Bundelkhand region last year. For this, BirdLife in India, in association with Rio Tinto and Bird Life International identified an area of 30,000 km.

"Although a safe alternative drug, meloxicam is available, the wild population continues to be under

constant threat of diclofenac poisoning, because people are unaware of its link with the disappearance of vultures. Vultures are known for their scavenger service and help in keeping an entire area free from diseases like rabies," said Dr Kamal Aneja, a veterinary surgeon.

In the coming years, adjacent areas could be converted into similar Safe Zones, creating a much larger diclofenac-free zone and enabling the vultures to once again establish self-sustaining populations. Haryana wildlife department has decided to release two vultures to begin with by putting satellite transmitters on them. In the last one year, 35 vulture nestlings have hatched. Nestlings of the first clutch are reared by the parents and the nestlings of the second clutch are hand-reared.

As part of the save vulture programme in the country, diclofenac/meloxicam swapping work is followed up with an extensive education and awareness programme on the value of vultures for the local community as they act as scavengers and therefore help reduce the risk of disease and increasing numbers of feral dogs.

Source :7th August 2015, The Times of India

Fed poison by poachers, vulture numbers fall

Kenya : Death feeds life on the Mara. Each summer, 5,00,000 wild beasts die along the treacherous migration from the Serengeti National Park in Tanzania to the Masai Mara National Reserve in Kenya. And with death come the scavengers, none more important than the vulture.

But the birds that once feasted on that misfortune, the janitors that clean the grassy plains, are collapsing with — part of a broader decline in vulture populations that throws off ecosystems and illustrates how far-reaching the effects of poaching, poisoning and other human interventions, harming the vulture population. can be. "The overall global picture for vultures is abysmal," said Darcy Ogada, the assistant director of Africa programs at the Peregrine Fund, an organization dedicated to saving birds of prey. "Does this story echo that of the canary in the coal mine? Sure does."

In the first major study of the 30-year decline of Pan-African vultures, Dr. Ogada and other scientists found that populations of eight species of vultures had declined at an average of 62%, with seven of those them species had declining at a rate of 80% or more over three generations. according to the study, published this summer in the journal Conservation Letters.

In some parts of Africa, vultures are targeted by poachers who poison carcasses hoping to kill the birds so they will not circle overhead and signal park rangers. A vulture can spot a dead elephant in less than 30 minutes, but it can take a poacher more than an hour to hack off ivory tusks. No vulture, no warning.

Here on the Mara, one of the greatest natural strongholds left on the planet, the vultures are not directly targeted but are the unintended victims of poisoning of carcasses that is meant to kill large carnivores, like hyenas, in an effort to protect livestock. Across Africa, the threats to wildlife are myriad, but much of the attention is focused on the stately animals of the savanna, like lions and elephants. Vultures do not make for pretty postcards, and the local authorities are already stretched thin trying to protect the animals that tourists come to see.

"Everyone forgets about the Ugly Bettys of this world," said Munir Z. Virani, who directs the Africa and South Asia programs for the Peregrine Fund. "We are told all the time by the authorities that they are so busy working to protect elephants and rhinos and other animals that when it comes to the vultures, they are exhausted."

Anthony Ole Tira, who is Masai and was raised on these lands and is now the co-owner of the Matira Bush Camp in the heart of the reserve, stood by a river crossing and pointed to scores of rotting carcasses.

One week earlier, 900,000 wildebeests, long in the face and often short on luck, had plunged headlong into the river in a panic. Thousands were trampled to death. That was normal. The rotting remains were not.

"Ten years ago, this would have been cleaned by now," he said. "There are a lot of places along the Mara River that are not as clean as they once were because there are not enough vultures."

In 2000, Dr Munir Z Virani, who directs the Africa and South Asia programs for the Peregrine Fund, was dispatched to India, where vultures were dying in great numbers but no one knew why. "Everywhere I went, there were dead vultures. But, their remains were in good condition," he said. "But everywhere, their remains were in good condition." The initial hypothesis was that some type of infectious disease was behind the deaths. Soon it became clear that the killer was man-made, in which a painkiller was widely used to treat livestock, that was poisoning the birds that fed on their carcasses. One carcass with the painkiller in its system could poison hundreds of birds, Dr. Virani said, and By 2006, when the painkiller was officially banned, the vulture population had already declined by 97%, Virani said. Over the same period, there was a drastic rise in cases of rabies in India, with feral dogs taking advantage of the decline in vultures and often spreading the disease to humans.

Dr Virani described what he called apocalyptic scenes, with hordes of wild dogs numbering in the thousands, scavenging the remains of livestock. Estimates vary, but some put the feral dog population in India now as high as 25 million.

Roughly 36 percent of the world's rabies deaths — the majority of them children — occur in India, according to the World Health Organization. The battle against the virus is costing the government billions of dollars.

Over tens of millions of years, Vultures have evolved into the most efficient cleaners in the natural world. because of their highly acidic gastric juices, due to which they can eat flesh infected with a variety of diseases without getting ill. When the vultures feast on diseased meat, picking the carcass clean, Thus, the threat of wider infection ends. But once the vultures are cleared from the skies, they are very hard to bring back.

Dr Virani explained that said vultures, despite their powerful digestive systems, are fragile and in their first year of life, vultures they have a n extraordinary 90% mortality rate.

Source : 28th August 2015, The Times of India

Ban on diclofenac, a lifeline for vultures

Kozhikode: The Union government decision to ban multi-dose vials of painkiller drug diclofenac has sparked fresh hopes for the survival of three critically-endangered vulture species in the state, the combined population of which is currently below 50 inside the Wayanad Wildlife Sanctuary (WWS). Their breeding population at last count was estimated at 35 Oriental white-rumped vultures, four Indian long-billed vultures and five red-headed vultures.

The government had banned the veterinary use of diclofenac in 2006 after it was found that the once-thriving vulture population in the country was near extinction after eating the carcasses of animals that were illegally treated with human formulations of the drug. A recent field study conducted by ornithologists in Wayanad found that despite the ban, a medical shop in Sultan Bathery was still selling human diclofenac in large 30 ml vials for veterinary use.

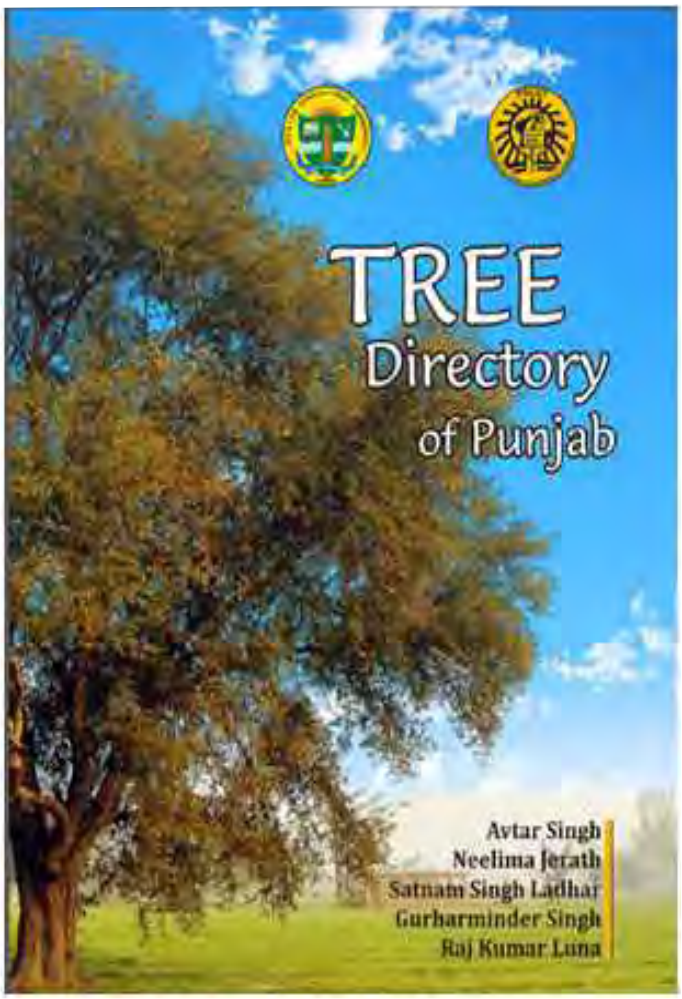
Ornithologist C K Vishnudas - who had been monitoring the vulture population in the sanctuary for the past many years - said that the Centre's decision to restrict the production of human formulation of injectable diclofenac to 'single unit dose pack' was an important step in ensuring the continued survival of these three critically endangered species. The drug - which is used to treat inflammation in livestock - is fatal for vultures as they experience acute kidney failure leading to death when they eat the carcasses of animals treated with the drug.

Source: 2nd , September 2015, The Times of India

Release of 'Tree Directory of Punjab' by Hon'ble Chief Minister, Punjab

Realizing the crucial role of trees in maintaining the ecological balance in the state, a scientific study was undertaken for documentation of tree diversity of Punjab jointly by ENVIS Centre, Punjab State Council for Science & Technology (PSCST) and Punjab Agricultural University and published it in form of book titled 'Tree Directory of Punjab'. Valuable inputs have also been taken from experts of Department of Forest & Wildlife Conservation, Punjab. The study was sponsored by Department of Science, Technology & Environment, Goverment of Punjab under Annual Plan Scheme. First time, this kind of exercise has been taken up in the state of Punjab. Extensive filed surveys were carried out throughout the state to document the first hand information about existing trees in forest divisions, wildlife sanctuaries, botanical gardens, zoological parks, wetlands, along the rivers,

S. Parkash Singh Badal, Hon'ble Chief Minister, Punjab releasing the Publication" Tree Directory of Punjab"



national & state highways and in universities & agricultural areas. The study was conducted by Scientists of PSCST namely Dr. Neelima Jearth, Dr. S.S Ladhar, Dr. Gurharminder Singh; Dr. Avtar Singh of PAU and Dr. R.K Luna, IFS, Rtd. PCCF. The study described distribution and occurrence of tree species all over the State apart from describing their economic and ecological significance.

The publication highlights unmatched environmental significance of native tree species which are particularly resistant to various environmental factors. Trees, unlike field crops, are largely undomesticated and provide habitats and support for animals, plants and fungi including symbiotic partners. Unlike most agricultural plants, forest trees can persist and thrive in unmanaged ecosystems and thus they can easily spread into areas for which they were not necessarily intended. Today, their value continues to increase and more benefits of trees are being realized as their role expands to satisfy the needs created by our modern lifestyles. These renewable resources are, however, under tremendous stress. Therefore, there is a need to introspect and take corrective measures for their conservation, management & sustainable utilization.

Punjab is primarily an agriculture state with about 83% land area under agriculture. The publication indicates that the state has only 6.49% of area (3271 sq.km) under forests which include 2.98% (1499 sq. km) of tree cover outside forests and 3.56% (1772 sq. km) forest cover. The State Govt. has launched "Green Punjab Mission" to increase forest cover in the state to 15%. In all, 165 tree species have been documented which include 117 native and 48 exotic species. Further, these tree species have been categorized into fruit (26), ornamental (74) and timber (65) species. Beside these, 11 species of palms, which are botanically not trees, have been also identified and recorded.

S. Parkash Singh Badal, Hon'ble Chief Minister, Punjab released the publication in a special function organized at his residence on 24.05.2014 to mark the International Biodiversity Day, 2015, described the trees as the most precious gift of nature to the mankind as these have supported and sustained life throughout our existence. He commended the role of PSCST and PAU for documenting the tree wealth of the State. He also congratulated all the authors of the publication. Dr. S.K Raju, Special Principal Secretary to CM; Sh. K.A.P Sinha, IAS, Secretary, Science, Technology and Environment(STE); Dr. B.S Dhillon, VC, PAU; Dr. R.K Luna, IFS, Principal Chief Conservator of Forests(Rtd), Dr. Neelima Jerath, Executive Director, PSCST and Team of scientist involved in study, were also presented on the occasion. Hon'ble CM has directed the scientists to indentify the suitable area especially around Anandpur Sahib and South Western Punjab for further propagation on important native tress species identified during the study.

It is hoped that present publication will serve as useful resource for policy makers & planners, forestry scientists, officers of State Forest Department & Punjab Biodiversity Board, , students, researchers, field level workers and other stakeholders, who are directly and indirectly involved in management & conservation of trees & forests.

ENVIS Staff Visit to VCBC, Pinjore

ENVIS staff visited Jatayu, VCBC, Pinjore to study the vultures being bred in captivity there. Total of 281 vultures having three species (White backed vulture, Long filled vulture & Slender billed vulture) are being bred in captivity to save them from looming extinction. The Centre has 6 Aviaries for taking care of vultures namely, Quarantine (for monitoring health for 45 days before bringing the vulture in captivity), Nursery, Holding, Colony, Hospital aviaries. Further, it has laboratory & veterinary care facility, incubator & brooder room facilities also. The birds are observed through CCTV cameras. The visit to facility provided a first hand experiences to observe vultures habits and have a discussion session with experts of BNHS namely Dr. Vibhu Prakash, Dr. Nimita, and other Research Scientists to compile the same in the article covered in this newsletter.

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