

Report on the Status of Indian White-backed and Slender-Billed Vultures, and of the Continued Availability of Diclofenac in Terai West Forest Division, Uttarakhand, 2009

Compiled by the Society for Mahseer Conservancy

FULL REPORT



CONTENTS		<i>Pg</i>
1.	PREAMBLE	3
2.	PROJECT AIMS AND OBJECTIVES Study Area Project Aims Objectives	4
3.	OBJECTIVE 1: SURVEY OF POTENTIAL WBV/SBV COLONIES Target Species Step 1: Preliminary Surveys Step 2: Monitoring of Important Vulture Sites	5
4.	MAJOR FINDINGS OF OBJECTIVE 1: SURVEY OF POTENTIAL WBV/SBV COLONIES	9
5.	OBJECTIVE 2: DICLOFENAC AND MELOXICAM MARKET SURVEY Veterinary Medicine Market Route Retail outlets for survey Veterinary drugs containing Diclofenac Diclofenac availability survey protocol Results of the Diclofenac availability survey	10
6.	MAJOR FINDINGS OF OBJECTIVE 2: DICLOFENAC / MELOXICAM MARKET SURVEY	14
7.	CONCLUSION OF OBJECTIVES 1 & 2	14
8.	PRORITY ISSUES IDENTIFIED Awareness of the Banned Status of Veterinary Diclofenac Awareness of availability of Meloxicam in retailers Human Diclofenac / Meloxicam price comparison Legal deterrent for selling human Diclofenac for veterinary purposes	15
9.	PROPOSED ACTION PLAN Awareness raising of the danger to vultures Veterinary community Meloxicam awareness campaign and promotion Reducing the market viability of human Diclofenac Increasing the deterrence to veterinary retailers Creation of a 'vulture restaurant' Scope of measures	17
10.	REFERENCES AND SOURCES	18

LIST OF TABLES AND GRAPHS		<i>Pg</i>
<i>Table 1, Counts for Ringora WBV Observations</i>		6
<i>Table 2, Counts for Ringora SBV Observations</i>		7
<i>Table 3, Counts, Dates and Times of Observation of Vultures at Tumeria</i>		7
<i>Table 4, Results of Observations at Hatidagar</i>		8
<i>Table 5, Results of Diclofenac Availability Survey</i>		13
<i>Table 6, Market Price Comparison of Meloxicam and Diclofenac</i>		15
<i>Chart 1, Presence/Absence of WBV During Observations</i>		6
<i>Chart 2, Ratio of Ages Forms, Ringora</i>		7
<i>Chart 3, Adult/Juvenile WBV recorded in Tumeria</i>		8
<i>Chart 4, Responses to Diclofenac Purchase Request.</i>		11
<i>Chart 5, Overview of the Responses Recorded</i>		12
		2

1. PREAMBLE

Three species of vultures in Asia are in grave and imminent danger of extinction across the Indian subcontinent. Populations of Indian White-rumped Vulture, *Gyps bengalensis* (**WBV**), Long-billed Vulture, *Gyps indicus* (LBV), Slender-billed Vulture, *Gyps tenuirostris* (**SBV**), have in the last 20 years experienced the most rapid declines ever observed in any animal species.

India has the highest number of domesticated cattle in the world, and being a largely non beef consuming Hindu country most of these are not kept for human consumption. India's cattle and buffalo population was estimated at over 307 million as of 1998, of which only 4% was destined for slaughter (FAS, 2003). This therefore leaves a massive amount of carcasses that need disposing of in some way, and the amounts of carcasses have increased along with the burgeoning human population.

This vast potential food resource had been efficiently dealt with until recently by vultures. Vulture numbers in India had increased to the point where by the mid 1980's the population of the most numerous species of vulture, the Indian White-backed Vulture (*Gyps bengalensis*), was estimated at well in the tens of millions, making it probably the most numerous raptor in the world at that time. Groups of up to 15,000 vultures were reported from the abattoirs around Delhi and northern India (Naoroji, 2006). Now, barely 20 years on, vultures particularly the *Gyps* or griffon species of vultures have all but vanished from the Indian sub-continent.

Studies by the BNHS put the minimum decline in populations for Indian White-backed vultures at 99.7% and 97.4% for Long-billed/Slender-billed vultures just between the years of 1992-2003, and the populations have continued to decline since (BNHS, 2007). The decline in WBV is now thought to be perhaps the fastest recorded population decline in any species.

All three species have now been placed under Schedule I of the Indian Wildlife (Protection) Act in 2002, and are listed as Critically Endangered by the IUCN.

The Drug Controller General of India implemented an order that the 'Licenses to manufacture veterinary Diclofenac should be withdrawn and the marketing of such products phased out within three months' on the 11th May 2006.

2. PROJECT AIMS AND OBJECTIVES

This project has been conducted by Mahseer Conservancy, a conservation focused NGO based in Ramnagar, Uttarakhand. Research staff consist of Mahseer Conservancy members, local naturalists, and specifically trained international students and volunteers. Additionally much information, logistical help and investigation was carried out by a variety of people from the business, agriculture and conservation network around Corbett.

The program was originally intended as a joint conservation and eco-tourism venture with the aim helping conserve and protect local vulture colonies. However after receiving information that Diclofenac might still be being used by the livestock holders in the area it was modified to include an investigation into the prevailing use of Diclofenac in the area. Therefore the current aims and objectives were modified to the following.

Study Area

The area covered in this report consists of essentially a fairly wide area east and south of Corbett Tiger Reserve. The survey area falls into two districts of Uttarakhand, Nainital district and Udam Singh Nagar. Being based out of Ramnagar, our investigations essentially have covered an area within a 30-40km of Ramnagar. Nearly all of the study area falls under the Terai West Forest Division.

The study area is the Terai and Bhabar tracts and is classed as the 'Upper Gangetic Plains' biotic zone and is characterised by two main habitats; semi-tropical, moist-deciduous forest (predominantly Sal, *Shorea robusta*). This is typically forested and hilly and climbing in altitude from around 400m above sea level to around 800m. Heading south of the foothills the landscape becomes predominantly flat and mostly taken up with agriculture, interspersed with areas of teak and eucalyptus plantations.

Project Aim

'To assess the threat to vulture colonies in the vicinity of Ramnagar due to the possible continued use of Diclofenac'

Over most of the Indian sub-continent vultures have completely died out, but around CTR there still remain a few healthy, if small, colonies, representing a crucial, wild population of these most endangered birds. What is currently uncertain, at least in the Corbett area, is whether there still exists a route whereby old, foreign or other stock of Diclofenac can find its way to livestock under the counter or through the black market. It is possible that human-use Diclofenac which is still legally manufactured and distributed could find its way to veterinary outlets.

The vultures surviving around Corbett Tiger Reserve are still present but the past decline shows that if Diclofenac is still being used even in extremely small quantities, they could be wiped in a very short time. After some co-ordination with the BNHS and Vulture Advocacy this project by Mahseer conservancy has been intended to ensure that any threat to small populations here can be evaluated and quickly responded to.

Objectives

1. To survey and monitor potential breeding populations of WBV and SBV
2. To assess the compare the availability and usage of Diclofenac and Meloxicam
3. To increase awareness of the ban on Diclofenac and promote usage of the safe alternative Meloxicam

The exact details of how these objectives have been realised are discussed below.

3. OBJECTIVE 1: SURVEY OF POTENTIAL WBV/SBV COLONIES

Target Species

The species focused on in this survey are the *Gyps* species present in the survey area which have suffered the most severe and acute population crashes, namely Slender-billed vultures, *Gyps tenuirostris* (SBV) and Indian White-backed vultures, *Gyps bengalensis* (WBV) vultures. Long-billed vultures, *Gyps indicus* is not found in the study area, and Himalayan griffons, *Gyps himalayensis* are uncommon near to the plains and Eurasian griffons, *Gyps fulvus* are also uncommon in this study area.

Identification of birds was achieved with help from various field guides, and on advice of nationally renowned birding guides, to ensure that species were not mis-identified. Raptors are generally regarded as difficult to identify, and this is especially true for the *Gyps* vultures for two main reasons, they are often observed soaring many kilometres up in the sky and *Gyps* family juveniles can be quite easily confused.

There are 6 other species of vulture recorded in or close to the study area and when observed they are noted. These species are;

- Egyptian vulture, *Neophron percnopterus* (EV)
- Red-headed vulture, *Sarcogyps calvus* (RHV)
- Cinereous vulture, *Aegypius monachus* (CV)
- Himalayan griffon, *Gyps himalayensis* (HG)
- Eurasian griffon, *Gyps fulvus* (EG)
- Bearded vulture, *Gypaetus barbatus* (BV)

This survey has progressed via a number of steps thus far;

Step 1: Preliminary Surveys

To enable us to quickly identify populations and nesting or roosting sites we followed a two main areas of investigation;

Direct Enquiries

Corbett is blessed with many knowledgeable nature guides and forest guards, so we pursued a line of enquiries with these contacts as well as with many people from farming and village communities. These yielded some results in at least we were notified of a regular feeding site at a carcass dumping ground which may be important as it acts as an unintentional 'Vulture Restaurant'.

Another interesting aspect of this approach was that the vast majority of rural villagers stated that whilst they remembered seeing vultures many years back, not a single one said that they had seen them recently. Although obviously some identification problems exist with rural village folk this gives the impression that the populations in this survey may be quite isolated.

Transect Surveys

A number of transect surveys were carried out on the roads bordering and outside Corbett Tiger Reserve. Whilst one trip back in November 2008 did uncover a very promising nesting site, not a single WBV or SBV has been sighted more than a couple of miles from the known colonies since. Locations where vultures may regularly nest or feed sites were identified by a combination of local and historical knowledge (garnered through a network of local contacts), and transect surveys. The methodology for the transect surveys conforms to recognised methodology as described in 'Birds of Prey of the Indian Subcontinent' (R. Naoroji), specifically open-top jeep covering large areas around Corbett Tiger Reserve. Roads along the periphery are covered at a steady speed, and when specific habitats are encountered they are intensively surveyed on foot.

Step 2: Monitoring of Important Vulture Sites

Surveys of these sites were in the form of direct observations, made on foot using 8x40 and 10x50 magnification binoculars and recognised field guides (namely; Birds of Prey of the Indian Subcontinent, R. Naoroji & Birds of the Indian Sub-Continent, Grimmett, Inskipp & Inskipp).

Data was collected at various times of day to try and gather data both when the maximum number of vultures were present roosting and when there was the most activity such as take-offs and landings to gather precise data on foraging patterns and numbers. Preliminary surveys showed these times to be that WBV and SBV spend the morning roosting till and are active between roughly 1000hrs and around 1500hrs and often return to the roosts between 1500hrs and 1900hrs in the evening.

Observations lasted between around 30mins to 1hr 30mins. The protocol for the observations at all sites was to attempt to record the maximum number of vultures seen perching and flying *at one time*. This was done to avoid double counting, so the total number of vultures recorded should be regarded as the minimum number of vultures present at the time of survey.

Three important sites were recognised where WBV and SBV vultures were regularly recorded.

1. **Ringora Village.** 29°26'4.50"N, 79° 7'48.34"E

Ringora is a village of encroachment status housing around 25 families situated either side of NH121 about 3km North of Ramnagar in the Nainital District. A few years back Ringora residents kept a fair quota of cattle, however as of now the amount of cattle is less than in many similar rural villages. At this site there has been a constant presence of vultures for at least 2-3 years however before then it is said by the villagers that the vultures had been absent.

Between 18 June and 24 August 2009 a total of 60 separate observations were made.

The maximum number of Indian white-backed vultures recorded at one time at Ringora was 15 individuals on the 23rd of June.

In this village WBV are seen almost on a daily basis roosting in four trees, all of which are large *Adina cordifolia*. Chart 1 shows that on 85% of surveys WBV were present.

Chart 1, Presence/Absence of WBV During Observations

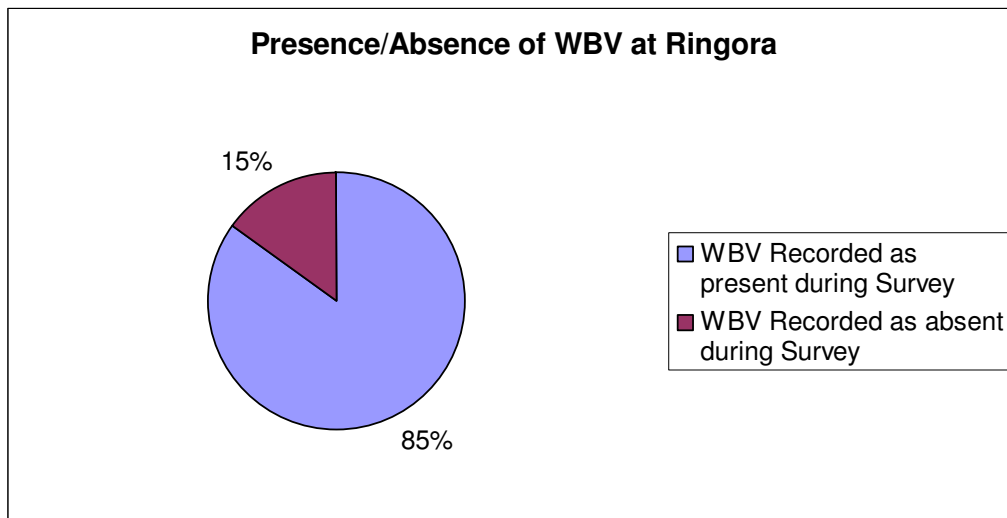


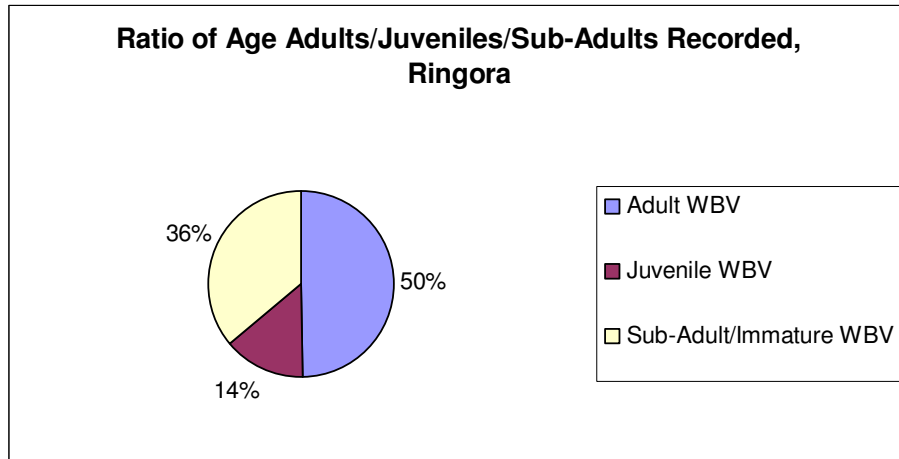
Table 1 shows the total number times recorded in one of these four trees for WBV, the total number of adult, juvenile and sub-adult/immature WBV, plus the average number of WBV observed per observation over the duration of the survey.

Table 1, Counts for Ringora WBV Observations

Total WBV Recorded	235
Total Adult WBV	117
Total Juvenile WBV	33
Total Sub-Adult/Immature WBV	85
Average Number of WBV per Observation	3.9

Chart 2 displays the ratio of each age category recorded at Ringora.

Chart 2, Ratio of Ages Forms, Ringora



Three of four regular roosting trees contain four nests between them, in all of WBV were recorded. In one nest WBV were recorded on 22% of observations, and once in the other three.

Slender-billed vultures were recorded on a couple of observations also at Ringora, albeit very occasionally, Table 2 displays the same data sets for SBV as Table 1 displays for WBV.

Table 2, Counts for Ringora SBV Observations

Total SBV Recorded	5
Total Adult SBV	4
Total Juvenile SBV	1
Total Sub-Adult/Immature SBV	0
Average Number of SBV per Observation	0,08

Over the 60 observations a single cinereous vulture and red-headed vulture were recorded once roosting in one of the trees, and Egyptian vulture was recorded four times in the trees, once landing and roosting for a short period in one of the nests.

2. Tumeria Village. 29° 18' 14.72"N, 78° 54' 55.58"E

Bordering Tumeria Dam, 22.5km south west of Ramnagar in Udam Singh Nagar District of Uttarakhand is a village of Van Gujjars, of between 10 to 20 families. Van Gujjars are well known for their large holdings of buffalos for dairy. Herds of hundreds can be seen grazing in and around the reservoir.

The village is surrounded on three sides by degraded sal forest (*shorea robusta*) and in these trees large numbers of WBV and upwards of five nests occupied by WBV can be seen. The people of the village say that the vultures have been constantly roosting in the village for a number of years.

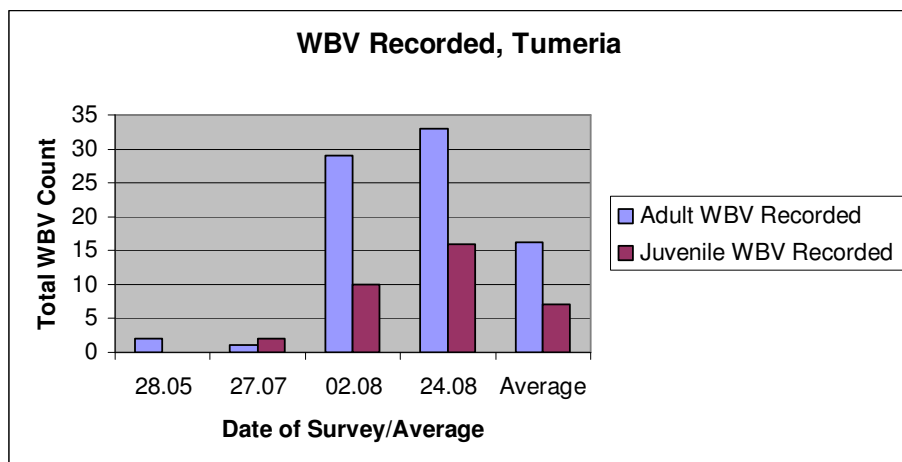
Between 28 June and 24 August 2009 a total of 4 separate observations have been made. After the first two observations, which took place in the morning, the villagers informed us that after 1600hrs there could be upwards of 40 vultures roosting. This certainly proved to be true as can be seen in Table 3 which shows the large numbers of vultures observed on two occasions after 1600hrs.

Table 3, Counts, Dates and Times of Observation of Vultures at Tumeria

Date	28/06/2009	27/07/09	02/08/09	24/08/09
Time Started/Finished Observation	1030-1130	1015-1045	1700-1800	1730-1830
Total WBV Observed	2	4	39	49

During the visits only WBV were observed at Tumeria. They all roost in the upper canopy of the *shorea robusta* trees in the village. All vultures appear to nest within the approximate boundaries of the village. Below Chart 3 illustrates the numbers of WBV recorded at Tumeria.

Chart 3, Adult/Juvenile WBV recorded in Tumeria



The villagers state that this population is present every day and there is no reason to doubt this. Also they usually have reports of a dead carcass nearby which may have been attracting very large numbers of vultures.

There general attitude seems quite pro-vulture, and in the village there is an old government poster dating at least ten years old giving information on Rajasthani vultures.

3. Hatidagar. 29° 21' 39.00" N, 79° 02' 21.30"

Hatidagar is a scattered village 9.2KM south-west of Ramnagar in Nainital District. The site referred to here is not situated within the village but is an area close to a gurdwara next to a drying riverbed, where cattle carcasses are regularly left. The surrounding area is mostly agricultural fields and eucalyptus plantations. The exact area where carcasses are left could be on the riverbed itself, or in adjacent areas of open scrub with many large *Bombax ceiba* trees. Egyptian vultures and black kites are regularly encountered here.

Carcasses appear to be deposited every three or four weeks.

Between 28 June and 24 August 2009 a total of 6 separate observations have been made, the results shown in Table 4.

Table 4, Results of Observations at Hatidagar

Date	28/06/09	23/07/09	27/07/09	27/07/09	02/08/09	24/08/09
Total SBV Recorded		17				
Total WBV Recorded		12				17
Total WBV / SBV		30				17
EV	12	4			2	3
OTHER	1 RHV					1 RHV
Number Observed Feeding	4 EV	4 WBV, 8 SBV, 2 EV				
Food present	Old Carcass	Litter	Litter	Litter	Litter	Carcass
Dogs Present		1				2

On the 23rd of July 17 SBV and 12 WBV were recorded (the majority observed feeding on the remains of a carcass) and on the 24th of August 17 WBV were present at the site. Information from local naturalists suggests that the vultures have been frequenting this site regularly for at least the last couple of years.

The both species appear to use the *Bombax ceiba* trees as temporary roosting spots whilst there is food

available at the site.

The three sites basically then fall under two separate categories;

- *Regular Nesting Sites* (Ringora and Tumeria)

Locations where vultures are consistently seen roosting and occupying nests throughout the year, so are therefore which are likely to be important breeding sites. As this monitoring has been carried out during the monsoon period, further monitoring during the breeding period (September to June, peaking between October and March) would be worthwhile.

- *Regular Feeding Sites* (Hatidagar)

Sites often where cattle carcasses are regularly left and vultures are commonly observed feeding.

4. MAJOR FINDINGS OF OBJECTIVE 1: SURVEY OF POTENTIAL WBV/SBV COLONIES

1. There is **at least two resident populations** of Indian White-backed vultures (*Gyps bengalensis*) residing within 30 minutes drive of Ramnagar.
2. There is at least one population of Slender-billed vultures (*Gyps tenuirostris*) residing within foraging distance of the vicinity of Ramnagar.
3. The populations regularly use at least one particular feeding site, Hatidagar.
4. The populations of WBV and SBV appear to be isolated populations. Numerous transect surveys and enquiries failed to turn up any more sightings of or reports of vultures within quite a distance of Ramnagar.

5. OBJECTIVE 2: DICLOFENAC AND MELOXICAM MARKET SURVEY

This investigation was focused locally in the areas of Nainital and Udam Singh Nagar districts, close to where we had identified existing WBV colonies.

The purpose of this objective was to ascertain whether Diclofenac continues to find its way on to the veterinary drug market and to the consumer endpoint of local livestock holders.

The first step was to build up a local profile of the veterinary drug market and the channels that livestock-holders use to obtain medicinal treatment for cattle. If it was found that somehow Diclofenac was still in sale and in use then the next step would be to investigate the reasons and channels whereby this was happening.

Through local contacts, business people, members of the farming community and veterinary practitioners who knew about the vulture crisis and were willing to lend their invaluable help and local knowledge, we were able to build up a good profile of the products and supply chain of Diclofenac in the area, including a comprehensive list of village outlets. A list of the Diclofenac-containing veterinary medicines that were previously in use before being banned was obtained, and information gathered as to the supply chain of said products, including small village shops.

Veterinary Medicine Market Route

From the manufacturer the veterinary medicine products are distributed to large wholesalers situated in major transport hubs. From this main distributor they are sold to *wholesalers* in most medium sized towns. From here the drugs are available to smaller *veterinary medical outlets* (small shops) in many villages, to persons operating as *veterinarian practitioners*, and to the livestock holders as customers as well.

Drugs therefore are obtainable by the livestock holders from the small village outlets, veterinarian practitioners or from larger local distributors in towns.

Note that this is specifically for veterinary Diclofenac. Human Diclofenac may have alternative channels for distribution. Also blackmarket stocks of either human or veterinary versions would have a different supply chain.

Veterinary drugs containing Diclofenac

AGILE K SWIFT, VOVESON, BIDMAC, BUTA M, DICLOFAM, DICLOFEN, DICLOMAT, DICLONAC, DICLOSAN, VESARTAN, LUFFAVET, NUFENAC, PYRNERC, RESTAMIN, ULFENAC, ZEBID, BUTAGENIC, 3DVET, CATLOFENAC, CICLOFEN D, CLOGIL, DICLODIN, DICLOFENAC, DICLOVET, DICLO ZEN, DISOVET, DICLONOT, ZIBID, D. P. FORMULA LOC.

Retail outlets for survey

Again local veterinary contacts supplied us with a comprehensive list of outlets in villages. The villages surveyed to date are; Kotabagh, Chandpur, Owlakhet, MoosaBhangar, Kaladunghi, Kaladunghi 2, Kamola, Damola, Belparau, Gehbowa, Choi, Malden chaur 1, Malden chaur 2, Malden chaur 3, Kila waly, Purnduara, Sultan purpatti, Jaspur 1, Jaspur 2, Patrampur 1, Patrampur 2

Diclofenac availability survey protocol

A researcher visited the veterinary medical outlets (the small village shops) passed on to us and attempted to purchase Diclofenac on the pretence that he was a livestock holder with a sick cow.

Essentially the protocol used was for the researcher to enter the premises, explain that they have a sick cow or buffalo and that they need medicine, and to mention they have used 'Diclovet' before. If probed they were equipped with a scrap of paper with the word 'Diclovet' written on it as a 'prescription'.

This undercover approach is the only way to obtain a true representative of whether these types of outlet

do still retail Diclofenac in an 'under the counter' way, a more open approach would result in outlets being dishonest and denying that they sell the banned substance.

Our researcher is a trained naturalist who is from the area and is familiar with agricultural practises, his family having livestock of their own. Therefore there was no reason for any store owner to assume he was anything other than a local person who was trying to get treatment for a sick cow or buffalo. 26 outlets were visited, of which 5 were closed or the owner not present.

Data Collected

Date, Name of Researcher, Name of Outlet, Type of outlet, Products Stocked, Price, Result of Purchase Attempt, Whether the Ban was mentioned, Any Other Comments

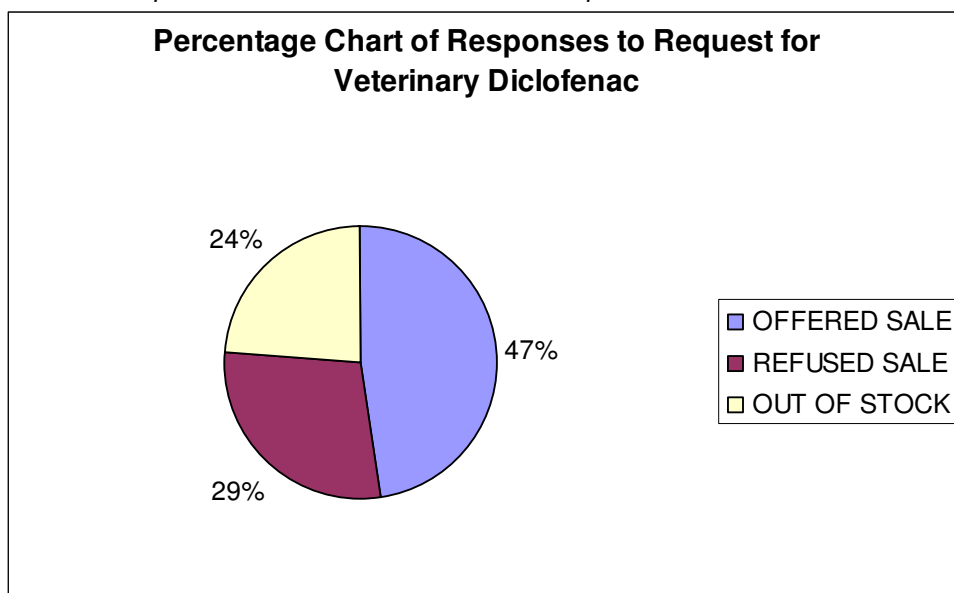
Results of the Diclofenac availability survey

The result of this survey was conclusive and alarming,

Out of the 21 visits our researcher was offered the human version of Diclofenac in no less than 10 outlets. Human Diclofenac products are for extensive purposes identical to veterinary Diclofenac but the dose is 3ml for a human and 10ml for cattle.

The three responses to the attempt to purchase Diclofenac can be categorised as either offered the sale of human Diclofenac, stated that they couldn't because it was out of stock or simply declined/refused to sell Diclofenac for whatever reason as shown in Chart 4.

Chart 4, Responses to Diclofenac Purchase Request.



Out of 21 outlets he was sold 30ml bottles of Diclofenac in 8 outlets. These bottles are all Diclofenac Sodium Injections for intra-gluteal use.

All the bottles were manufactured in Uttarakhand (UK) or the neighbouring states of Himachal Pradesh (HP) or Uttar Pradesh (UP), and the dates of manufacture range from Jan 2008 to Apr 2009.

All the bottles are marked as a Schedule H drug and not for sale without a prescription, and all bottles except two state that they are not for veterinary use.

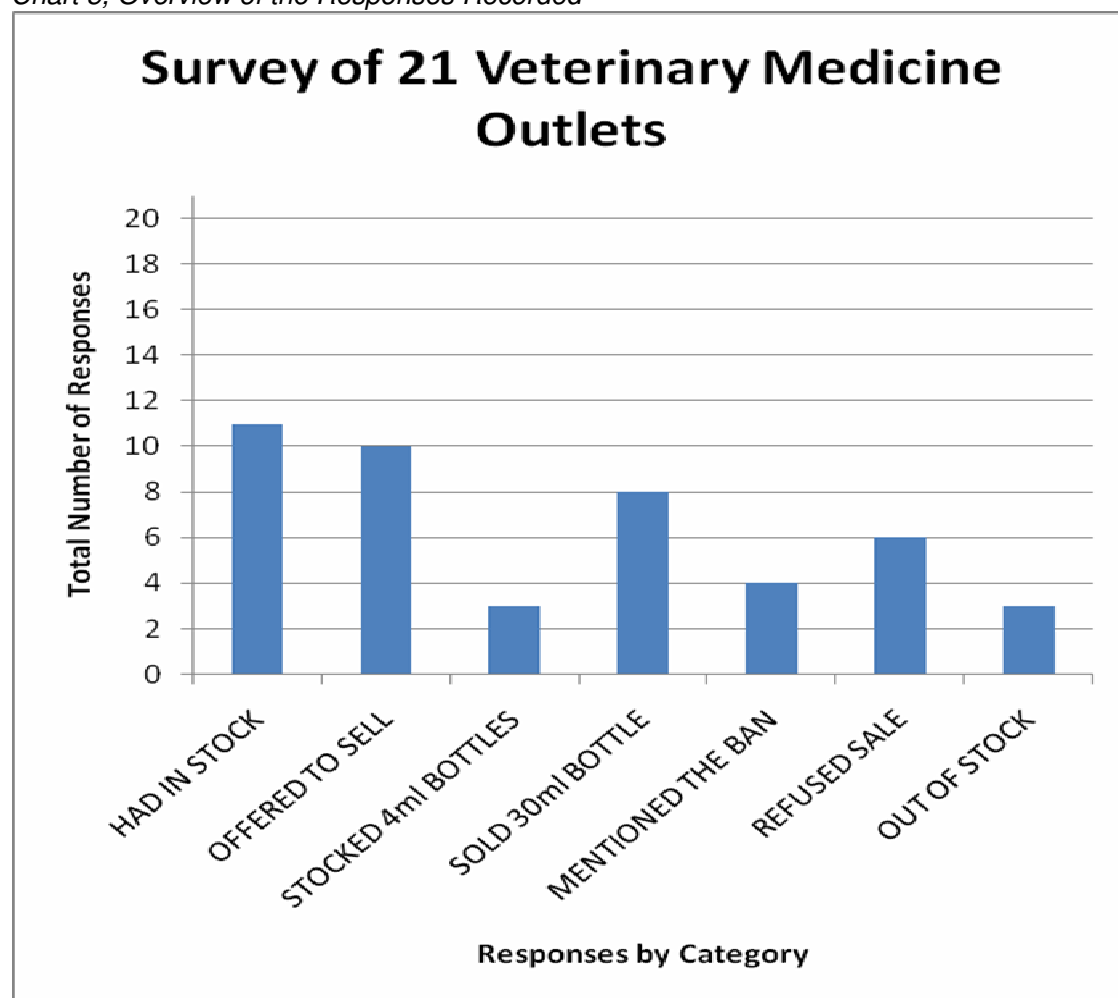
The price range was between 20 and 40INR. The average price for a 30ml bottle was 27INR, and this is the price to a man off the street, so to a known customer the price would more likely be closer to 20INR.

Twice the researcher was offered 3ml bottles. Full results can be seen in Table 5.

Due to the necessity of maintaining a cover the researcher did not want to ask too many questions or risk arising suspicion, however of the 10 outlets which offered the human Diclofenac, 5 volunteered that it was the human so he would need to administer a triple dose. In 4 stores he was told that it was banned for veterinary use, in one of these instances he was then still sold a 30ml bottle.

Chart 5 gives an overview of the responses received by the researcher.

Chart 5, Overview of the Responses Recorded



It is worth considering two parameters of this survey;

- 1. The outlets are all known and recognised veterinary outlets, supplied to us by a practising veterinarian**
- 2. The researcher clearly stated from the outset it was for veterinary use**

It is very important that not in a single outlet did a single retailer even mention Meloxicam.

The villages in these rural areas are very small and close communities, and anyone from outside the surrounding villages might arise suspicion. The researcher has confirmed that in at least a couple of shops this probably was the case. In that case it is probable that many more retailers do retail human Diclofenac for veterinary use.

Communication with the farming community and information gained through this investigation suggests that it is not the very small livestock holders (two or three domestic cattle) who would be using Diclofenac, but livestock holders for whom the cattle are for commercial dairy purposes.

Table 5, Results of Diclofenac Availability Survey

DATE	LOCATION	TYPE OF OUTLET	BRAND, DATE & STATE OF MANUFACTURE	ml	PRICE	OUTCOME	BAN MENTIONED
08-août	Kotabagh	Medical Store				Refused sale	No
08-août	Private Practitioner, Chandpur	Private Practitioner	4ml Diclofenac	4ml		Sale offered	No
08-août	Private Practitioner, Owlakhet	Private Practitioner	4ml Diclofenac	4ml		Sale offered	No
08-août	MoosaBhangar	Private Practitioner				Refused sale	No
08-août	Kaladunghi Medical store	Medical Store	4ml Diclofenac	4ml		Refused sale	Yes
08-août	Kaladunghi	Private Practitioner				Refused sale	No
08-août	Kamola	Private Practitioner				Closed/Owner not present	No
08-août	Damola	Private Practitioner				Closed/Owner not present	No
08-août	Belparau	Medical Store				Refused Sale	Yes
08-août	Gehbowa	Private Practitioner				Closed/Owner not present	No
08-août	Choi	Private Practitioner				Closed/Owner not present	No
09-août	Malden chaur Store 1	Medical Store				Refused Sale	Yes
09-août	Malden chaur Medical Store	Medical Store	Disic, 04/2009, UP	30ml	25INR	Sold	No
09-août	Malden chaur Store 3	Private Practitioner				Closed/Owner not present	No
09-août	Kila waly Medical Store, Kily waly	Medical Store	Voviben, 12/2008, UK	30ml	40INR	Sold	No
09-août	Shubum Medical Store, Purnduara	Medical Store	Eldofen, 01/2008, HP	30ml	27INR	Sold	Yes
11-août	Shubum Medical Store, Kundesori	Medical Store	Diclolab, 10/2008, HP	30ml	20INR	Sold	No
11-août	Agarwhal Medical Store, Sultan Purpatti	Medical Store	Dicloflame, 05/2008, UK	30ml	25INR	Sold	No
11-août	Doraha	Medical Store				out of stock	No
11-août	Bazpur Store 1	Medical Store				out of stock	No
11-août	Bazpur Store2	Medical Store				out of stock	No
11-août	Bed Medical Store, Bazpur	Medical Store	Diclonova, 10/2008, HP	30ml	30INR	Sold	No
25-août	Jaspur Store 1	Medical Store				out of stock	No
25-août	Jaspur Store 2	Medical Store				out of stock	No
25-août	Chakrawatri Medical Store, Patrampur	Medical Store	Arofen, 12/2008, HP	30ml	25INR	Sold	No
25-août	Singh Medical Store, Patrampur	Medical Store	Arofen, 12/2008, HP	30ml	25INR	Sold	No

6. MAJOR FINDINGS OF OBJECTIVE 2: DICLOFENAC / MELOXICAM MARKET SURVEY

1. **Human Diclofenac is regularly sold for veterinary purposes**, in a number of locations within just a few kilometres of the two known vulture colonies and a regular feeding site.
2. Human Diclofenac sale for veterinary purposes is fairly geographically widespread, at least in this survey area.
3. The banned use of Diclofenac for veterinary purposes is known by many of the retailers selling it.
4. **Meloxicam is not offered as an alternative.**
5. Very few village people are aware of the specific reason (Diclofenac) for the vulture decline.

7. CONCLUSION OF OBJECTIVES 1 & 2

There is definitely a strong possibility that in this area, vultures may be at risk of local extinction via Diclofenac poisoning.

The Eight 30ml Bottles Purchased from Veterinary Medical Stores



8. PRORITY ISSUES IDENTIFIED

The findings of this report categorically show that at least in this survey area and almost certainly much further a field in the Terai belt that human Diclofenac is being sold for veterinary purposes, and that Meloxicam is not widely sold or used. The question as to why the sale of human Diclofenac for veterinary purposes instead of Meloxicam must be down to either one or a combination of the following factors;

a. Awareness of the Banned Status of Veterinary Diclofenac

During the surveys we spoke to a large number of village people and it was certainly true that there exists an almost complete lack of awareness about the effects on vultures of Diclofenac. In fact virtually every villager we spoke to expressed some sorrow that vultures had disappeared, and in the villages where vultures remain the people are quite fond and proud of them.

However there is also almost no doubt that lack of awareness is not the case with the veterinary medical outlets or private practitioners that continue to supply human Diclofenac are unaware of the ban (private practitioner refers strictly to the type of unlicensed, unqualified vets known locally as 'quacks'). Whilst our researcher was not necessarily told the human Diclofenac he purchased was banned, he stated that certainly all the retailers supplying it were almost certainly aware. So therefore if the retailer is aware that the product is banned but the customer is not he can take advantage of this, especially as the customers are often isolated rural communities, the Van Gujjars being a prime example.

b. Veterinary medicine retailers are unaware that Meloxicam is available

As not a single outlet mentioned Meloxicam, even the ones that said Diclofenac was banned and refused to supply it, this is quite a possibility.

c. Human Diclofenac may be more profitable to sell the Meloxicam

A price comparison between the average cost of human Diclofenac during our survey of veterinary outlets, approx 25INR, and the usual market rate of Meloxicam, 60-80INR (from personal communication with Government Chief Veterinarian for Ramnagar, September 2009) reveals that the price difference to the customer is minimal.

However the problem lays in that a 100ml bottle of human Diclofenac from a non-veterinary pharmacy is as low as 20INR.

A normal single dose for cattle of Meloxicam or human Diclofenac is 10ml. Table 6 below shows a price comparison for a 10ml between Meloxicam and Diclofenac at the two different rates, one for Diclofenac bought from a veterinary retailer and one from a human pharmaceutical retailer.

Table 6, Market Price Comparison of Meloxicam and Diclofenac

Product	Quantity (ml)	Average Price per Bottle (INR)	Approx Price per 10ml (INR)
Meloxicam 100ml Bottle (from Veterinary Retailer)	100	60 - 80	7
Diclofenac 30ml Bottle (from Veterinary Retailer)	30	20 - 30	8.3
Diclofenac 100ml Bottle (from Human Pharmacy)	100	20	2
Diclofenac 3ml Bottle (from Human Pharmacy)	3	2 - 12	6 - 40

Therefore it can be seen that at these prices human Diclofenac is available at this price and quantity then profit can be made selling on 30ml bottles as a veterinary drug.

This is unfortunately evidence of the hypothesis in the 'Action Plan for Vulture Conservation in India' (*Ministry of Environments and Forests, 2006*) that;

'Any steps at terminating veterinary use of Diclofenac would be ineffective because of the possibility of diversion of human Diclofenac formulations to veterinary use'.

d. There is not a sufficient enough legal deterrent for selling human Diclofenac for veterinary purposes, or retailers are not aware of the legal deterrent for selling human Diclofenac without a prescription

The Diclofenac ban states that 'Licenses to manufacture veterinary Diclofenac should be withdrawn and the marketing of such products phased out within three months'.

Human Diclofenac is classed as a Schedule H drug under Indian law.

A retailer selling Schedule H human Diclofenac, knowingly or unknowingly for veterinary use, without a prescription is committing an offence, and is doing it at risk to himself, so therefore this is either because he doesn't know of the penalty if caught, or knows and doesn't care.

9. PROPOSED ACTION PLAN

Any action plan for the conservation of vultures must therefore aim to combat the four major issues outlined in the previous section, which are put simply;

- Lack of awareness of the dangers to vultures, and banned status of, Diclofenac amongst villagers and livestock holders
- Lack of awareness of Meloxicam by veterinary medicine retailers
- There is a market opportunity for diversion of human Diclofenac to veterinary
- Veterinary retailers are unaware, or don't care, about the illegality of supplying Diclofenac without a prescription

To tackle these issues the following corresponding measures are suggested to attempt to reduce the amount of human Diclofenac subverted for veterinary use.

Awareness raising of the dangers to vultures amongst villagers and livestock holders

Mahseer Conservancy has successful previous experience in staging and running an awareness campaigns to stop the dynamiting of fish in the Ramganga valley, and understand the importance of reaching out to people in an informal, un-preaching manner.

We are now already undertaking a grass-roots campaign to raise the awareness of the decline, its causes and its consequences in the area, and building a network between Mahseer Conservancy and important local communities. Below is the poster we have created and have already distribute in many key areas, such as in villages, to livestock holders, to veterinary practitioners, at agricultural medical outlets, around feeding and nesting sites, in schools and at tourist spots around Corbett Tiger Reserve.

Diclofenac Awareness Poster



The poster is aimed at the local livestock holders and is hopefully made in a manner that they will sympathise and relate to. The text is in plain Hindi and simply emphasises that vultures play an important role in the ecosystem, are gravely threatened by Diclofenac and that the substance is banned.

Another simple and cost-effective tactic for an awareness campaign is to establish a network of environmentally conscious and conservation-minded local people in key areas and to give them the necessary information and motivation to encourage their own communities to help save vultures.

In many areas, notably the Van Gujjar tribe villages this is especially important. These tribes keep a massive amount of buffaloes, which may be the reason for their link with the large vulture colony that is resident there.

Workshops and visits to villages can be an effective way of raising awareness in communities. Suitable venues for these visits would be local fairs (to guarantee a good turn out) and local schools (if the youth can be converted often adults quickly follow). During these workshops we will distribute printed media hold showings of the educational documentary 'Vanishing Vultures' by Mike Pandey and readings of a moving poem by a Kumaon University professor, and simply talk to people, encouraging well-known and respected role models to appear and do the same. Sports for conservation has also been shown to be a highly effective medium in the Ramganga conservation scheme.

Awareness campaign and promotion of Meloxicam amongst the veterinary community

Mahseer Conservancy has already asked the Deputy Director of Veterinary Healthcare of Uttarakhand to call together a meeting has called this meeting 19th September, which has been commendably and quickly instigated. Attending this meeting will be much of the local veterinary community, hopefully including many of the private veterinary practitioners and retailers from the small villages and key areas covered in this report.

The agenda for this meeting is quite straightforward, simply;

- i. Outline the urgency and gravity of the situation regarding vultures and Diclofenac
- ii. To emphasise the banned status of any form of Diclofenac for veterinary use
- iii. Raise awareness of Meloxicam
- iv. Discuss methods for increasing availability of Meloxicam (such as through schemes with commercial dairies).

Reduce the market viability of human Diclofenac for veterinary use

As outlined in the 'Action Plan for Vulture Conservation in India' (*Ministry of Environments and Forests, 2006*) it is difficult to make Diclofenac prohibitively expensive for human use.

The findings in the investigations suggest that the bottles that are sold on for veterinary use are usually the 30ml. As can be seen in Table 6, a 30ml bottle can be sold under the counter at a competitive rate, and if obtained at the rate for a 100ml bottle with a decent profit margin.

A 30ml bottle is about enough to give a cow or buffalo 3 separate doses, and a person 10 doses. Using 3ml bottles and person would need at least 4 bottles to successfully give a cow or buffalo just a single shot. According to our current market information from the pharmaceutical community in Ramnagar the cost of 3ml bottles can vary from 2 to 12 INR depending on which company it is manufactured by. Taking a price from the upper range of this estimate already makes this cost for veterinary use unviable.

Therefore it is surely to be recommended that Diclofenac should *only* be available in 3ml bottles, preferably with a compulsory minimum retail price of at the least 12 INR. Going back to the 'Action Plan for Vulture Conservation in India' it is suggested that for patients who need a regular supply or may suffer adverse effects from alternatives then, possibly a system could be put in place where a form of certified ongoing subsidised prescription could be put in place, if only for places in districts where vultures are present.

Additionally it would be more hassle to obtain lots of small bottles for people wishing to treat cattle with Diclofenac, especially if combined with stricter prescription control.

Increase the deterrence to veterinary retailers for selling Diclofenac without a prescription

Currently the deterrence of the illegality of selling a Schedule H drug without a prescription appears to be failing to keep retailers from selling Diclofenac under the counter. It is unlikely that any veterinary medicine retailers make so much money from the trade that they would persist if even in the face of stronger and much more visible legal deterrence. To increase this deterrence at least two simple and cost-effective actions could be instigated;

1. Government enforced signage could be displayed in shops to deter customers. Certain village veterinary medicine outlets in key areas could be forced to display small signs near the counter

(similar to ones relating to sale of tobacco or alcohol to minors) stating that Diclofenac is illegal for veterinary use to deter customers and sellers.

2. A visit from a uniformed policeman to inform and warn retailers that the ban on Diclofenac is to be taken seriously would be a highly visible and effective tool to deter sellers. This could be combined with a random checking of shops using virtually the same protocol as in Objective 2 of this report. If this checking, and the response to any sales of Diclofenac followed up, was made common knowledge, this could undoubtedly bring down the temptation to sell or stock the drug.

Creation of a 'vulture restaurant'

As well as the four previous measures which are all essentially aimed at reducing already occurring threats, a managed vulture restaurant could be set up to pro-actively help conserve these populations of vultures. Vulture restaurants are areas where carcasses are purposely and regularly left for vultures to consume. It is obviously vital that when providing carcasses they must not contain residues of any form of Diclofenac. In 2003 to 2004 a vulture restaurant was set up in Punjab, Pakistan by Birdlife International. They prevented any contaminated carcasses being put out by mistake by offering donkey carcasses (donkeys being much less likely to be treated with Diclofenac) and withholding them for a minimum of one week to ensure that any possible residues would subside. They concluded in that study although the 'Supplementary feeding may prove to be a useful management tool for slowing declines locally in the short term' it was not enough to prevent the colony from going extinct, that vultures would still potentially feed elsewhere. However the situation at a future Corbett based safe vulture restaurant would indeed decrease the amount of time and therefore chance that vulture colonies at Ringora and Tumeria find a carcass that does contain Diclofenac, which could potentially wipe them out.

The observation in objective one suggest that there is already and uncontrolled and unintentional vulture restaurant occurring at the Hatidagar carcass dumping ground already. Vultures are present very often at the site and reports of numbers of over a hundred when carcasses are left are not uncommon. If one of these carcasses does residues of Diclofenac then this could be disastrous. The only solution would probably be to test carcasses before they are left, but in reality this would not be possible, recommending that awareness raising and community-based initiatives in the surrounding area are very important.

Monitoring of resident colonies

By monitoring the nesting and roosting sites regularly this will give us the ability to quickly notice and respond if any signs that vultures are suffering from Diclofenac poisoning occurs. If signs appear then we will co-ordinate with the appropriate authorities to have the affected vultures evacuated to the breeding centre in Pinjore, Haryana for immediate treatment.

Scope of measures

The scope of these conservation measures are at present focused on the Terai West Forest Division. Terai West Forest Division is around 350km² so although this much less than the potential foraging range of the *Gyps* vultures, who can cover a 300km radius or more when foraging for food, it is a manageable size for effective conservation measures. It is also worth noting that there is extensive scope for community-involvement within the Terai West Forest Division, in particular with the Van Gujjars, who maybe are the most important group of people concerning the fate of the vultures in the region.

10. REFERENCES AND SOURCES

BNHS, 2009, [online],
<http://www.bnhs.org/article.php?cid=Mjl%3D&sid=MjU3&aid=MjYz&t=Mg%3D%3D&PHPSESSID=1ea6ab72c83f23cf4e47eb4db529c4de>

Birdlife International, 2007, [online] 'Vulture restaurant slowed deaths, but extinction looms',

Birds of Prey of the Indian Subcontinent, Rishad Naoroji, Om Books International, ISBN 8187107699

Birds of the Indian Sub-Continent, Richard Grimmett, Carol Inskipp & Tim Inskipp, *Oxford University Press*

USDA/FAS, 2003, [online], <http://www.fas.usda.gov/dlp2/circular/1998/98-10LP/beef.htm>

**Indian White-backed Vultures,
Tumeria Village, 24.08.2009**



Thank you indeed to every person involved for helping make this report.