Bats as Seasonal Sources of Meat among Poor Chepangs
Gandhiv Kafle and Prakash Limboo

Ethnozoology is the study to know how cultures use animal and animal byproducts. It includes classification and naming of zoological forms, cultural knowledge and use of wild and domestic animals. Ethnozoology is an interdisciplinary subject and combines anthropological, cognitive and linguistic perspectives with natural scientific approaches to the description and interpretation of people's knowledge and use of animals. The broader focus is on how animals are perceived, used and managed in human societies, including their use for food, medicine and personal adornment, as well as their use in divination and ritual.

This article is based on rapid assessment carried out in September 2008 on ethnozoology of bats in Chepang community of Thumka village of Bhumlichowk Village Development Committee in Gorkha District of Nepal. Direct observation and key informants' interview were the major methods used in this study.

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Chepangs are one of the tribal groups with semi-nomadic existence in Nepal. Most of them are still practicing traditional means of subsistence such as food gathering and hunting. Chepangs live in the Gorkha, Tanahun, Chitwan, Makawanpur and Dhading districts. In Thumka VDC of Gorkha District, more than 40 households of Chepangs live in poor condition. Almost all of the households have Shifting Cultivation (SC) plots. They practice slash and burning of the existing forests and shrubland in steep slopes and cultivate cereal crops such as maize and bean. Most of them have no own registered land for cultivation.

The production from the SC sites does not meet their annual food demand. To sustain their family for whole years, they do wage labour and some of them have gone to Arab countries for jobs. In the past they leave the SC sites fallow for some years to regain the soil fertility but nowadays due to more food demand to sustain increasing number of family members, they use to cultivate the SC sites regularly with no annual fallow. It has fueled up the land degradation process in this area.

Chiuri (*Bassia butyracea*) trees are naturally found in forests of Thumka village. It flowers during October and November. The juice in the flowers attracts the bats. Bats start to come at Chiuri trees after sunset, but more between 8-12 PM. Chepangs are familiar with this and they come prepared for hunting bats in this time. They use local materials to prepare net for bat trapping. The bat trap consists of two bamboo sticks of about 12-14 metres long and a net of thin plastic wire. Its structure is similar to mist net. Only one person is sufficient to...
hold the bat traps – two bamboo in two hands on cross-pattern. The net of the bat trap is kept expanded in front of the flowering branches of the Chiuri tree at about 5-8 metres distance. When the bat comes to suck flowers, it gets trapped in the net. The hunter then collapses/folds the net by bringing two bamboo sticks closer together. They use two methods to kill the trapped bats: by plucking the heart, and by biting the head. The latter method is risky because of being bitten by bats. Few Chepangs also use catapult to kill the bats in steep rocky slopes. They inform that the taste of its meat is very good and is nutritive. Bats form seasonal sources of free meat to the Chepangs. In the season, one hunter generally collects 3-5 bats a night. Chiuri trees are scarce nowadays. It is because while converting forest to shifting cultivation site, the seedlings of Chiuri trees are generally removed. Still the arrival of the bats in remaining Chiuri trees is promising. It seems essential to initiate a detailed ethnozoological study of bats amongst Chepangs in different parts of the country to understand the relationship between Chepangs, their culture and bats. Thanks to LIBIRD for arranging the resources for this short survey.

References

Author holding Least Leaf Nosed bat (Hipposideros cinneraceus) captured at the house yard of Sulubung – Tari, Ilam District of Eastern Nepal during November, 2008

“Hey! Is there batty tourist living in your home?” An old voice reached my ears from the footpath above the house compound. We were inside the home waiting for dusk so that we could set mist nets after unsuccessful efforts of the previous day. The old man did not wait for a response from the house residents but began to talk. “A few years ago, several bats could be seen in the surrounding area. Bats used to enter to our homes and light down on our kerosene lamp and candle. Peoples of the house used to be afraid of the biting of bats. The peoples used to say ‘bats urine damage the eye, so we killed many bats that entered to our houses for fear of bat borne blindness. Since that time ever since seen or heard of a bat damaging peoples eye’. The man had no time to listen to other people. We were listening with great interest from inside. He didn’t see us and we didn’t venture outside, but we let their conversation flow and were entertained to hear his experience. The old man further asked our house owner “Do you know the bat cave of the next hill behind the river? I saw thousands of bats there in my childhood. There was tons of crap in the cave. But I heard that there are no bats these days! Where they gone?” (Dhan Khane Muso chat paune Bhagyuto - a Nepali saying meaning “Mice destroy the rice, frog getting punishment”.)

Meanwhile another adult man came and joined in their talking. He said, “Young boys kills many bats these days too. He one boy had a long bamboo stick in hand, foraging bat. At the same time, another boy attacks it with a stick and enjoys killing it. People believe the flesh of bat is good to cure the bloody urine problem in cows, buffaloes and ox, and even to cure asthma of man. Last year, I fed a few bats to my cow but unfortunately the cow live no longer”. After half an hour talk,

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they ended their bat stories and moved to their destination. I was disappointed with the peoples experience. I felt these people could make a significant contribution for biodiversity conservation and ecological transformation if they knew what to do. They were unaware of the importance of bat fauna but have very interesting experience. As a researcher, it should be our duty to teach them the real story of bats.

This story was documented during a field trip of “Bat diversity hot spots and its conservation implication” a project ongoing in Makalu and Kanchenjunga Singhalila complex in eastern Himalaya. The project had financial support from Critical Ecosystems Partnership Fund (CEPF) in collaboration of World Wildlife Fund, Nepal. We surveyed the bats at Danabari, Chisapani sector, Maipokhari, Sulubung, Maimajuwa, Pyangjamuna-mabu sector of Ilam district and Yamphudin sector of Taplejung on this trip. We captured 1 bats from caves, abandoned buildings, temples, human dwellings, schools, wetlands, forests, and banana cultivation with the use of mist nets, scoop nets and harp traps. The bat echolocation sound was recorded with the help of Bat-detector for microchiropteran bats. About 22 bat caves were visited but only 9 of them were found with bats during our one month visit. The entire remaining caves contained many kilograms of old bat guano with no single bat indicating them as past bat roost. Most of the caves contained partly burned wooden pieces and coals which tell the history of cave. Till date, *Cynopterus sphinx*, *Rousettus leschelnauti*, *Megaderma lyra*, *Hipposideros armiger*, *Rhinolophus Pusillus*, *R. Ferrenquinum*, *Pipistrelus pipistrellus*

Miniopterus schrebersi, *scotophilous* spp. were identified with the help of morphometric analysis. Still some data is under analysis for suspected *myotis, pipistrellus & Hipposideros species*. In our guess, the study site must be a site for two threatened bats namely; *Myotis longipes* (kasmir cave bats) and *Myotis sicarious* (Mendellis mouse-eared bats) due to the existing ecological similarity to their originally reported sites. Hereafter, *Myotis longipes* is currently reclassified as the *Myotis csorbai* (Csorbais Nepalese Bat), and believed endemic to Nepal. We aim to find the status of these species along with the overall bat survey.

Peoples response on setting fires in the caves seemed due to conflict with a porcupine-like small mammal which destroys their crops yearly. In reality, the caves are not the primary nesting area of porcupine; it is only an emergency hideout to protect them from angry farmers. Our present evaluation of the study area is the need of a bat conservation awareness program among ignorant farmers and children to stop further anti-bat activities. Since most of the students were found to involve in aimless hunt of bats, they need to be taught different behaviour. The problem of using bat flesh to feed or cure domestic animals by the farmers is seems very dangerous. They were found feeding the uncooked bat flesh mixing with fodder. It may transmit several bat borne zoonotic disease like leptospirosis, rabies, and several viral disease.
Contents

Bats as Seasonal Sources of Meat among Poor Chepangs, Gandhiv Kafle and Prakash Limboo, Pp. 1-3

Bat Story from Eastern Himalaya, Nepal, Pushpa Raj Acharya, Pp. 3-4

Notes on Greater False Vampire bat from Lawachara N.P., Bangladesh, Mohammad Abdul Aziz, Pp. 6-7

Additional Sightings of Pteropus colonies in plains of Eastern Nepal, Sanjan Bdr. Thapa, P. 8

Notes on Indian Flying Fox (Pteropus giganteus) roosts in Bangladesh, Monsur Rahman & M. A. Aziz, P. 9


Species diversity and distribution of bat in Panchase region of Nepal, Achyut Aryal, and Sanat Kumar Dhungel, Pp. 11-14

Awareness Programme makes a difference in Madan Pokhara Valley, Nepal, Hari Adhikari, Pp. 15-16

Status and Conservation of Indian Flying Fox (Pteropus giganteus Sign.) Roosts in Karnataka, Chakravarthty, A.K., Thyagaraj, N.E and Yeshwanth H.M, Pp. 17-20

Announcing Bats in Captivity Volume 1: Biological and Medical Aspects, the first of a four-volume series covering all aspects of bat care, P. 21-22

Amazing Bat Facts from around the world, Susan Barnard, (http://www.basicallybats.org/basicallybats/index.html), P. 23

Merlin Tuttle: he has given the name Batman a whole new meaning http://www.batcon.org/news2/scripts/newsletter.asp?newsletterID=58, Pp. 24-25

Field Training and Bat Exploration by Bat Friends, Niroj Man Shrestha, Pp. 26-27

Progress of ongoing Project PteroCount www.pterocount.org, Sanjay Molur, P. 28

Long Saga of Finding South Asian Bat Photos - still pending, P. 29

Two Training Workshops for 2009, P. 29

Recent Observations of Nicobar Tree Shrew Tupaia nicobarica (Zelebor, 1869) on Great Nicobar, Island Satish Pande, Niranan Sant, and Shivkumar Pednekar, Pp. 30-31

Mating behaviour of Jungle Striped Squirrel Funambulus tristriatus at Kodanad, Ernakulam District, Kerala, Smitha. K. Komath, P. 32

Sighting of Long eared and Indian hedgehog at Morkhakhra - (Khanpur Range, Panchmahals) Gujarat, Virag R Vyas, Jayendra J Lakhmapurkar and Deepa Gavali, Pp. 33-34

Occurrence of Indian Bush Rat (Golunda elliottii) and Spiny Field Mouse (Mus platythrix) in Tiruchirappalli district, TN, India, P. Sakthivel and P. Neelanarayanan, Pp. 35-36

Opportunistic Scavenging by Lesser Bandicoot Bandicota bengalensis (Gray & Hardwicke) in Gulab Bagh Zoo, Udaipur, Rajasthan, Satish Kumar Sharma, P. 36

CCINSA and RISCINSA members, Pp. 37-45
Notes on Greater False Vampire Bat from Lawachara N.P., Bangladesh
Mohammad Abdul Aziz

Introduction: The genus *Megaderma* (Geoffroy, 1810) is a taxon of Old World bats confined to the tropics of Africa, Asia and Australia. This genus includes two species with wide geographical ranges from Afghanistan to the Molucca Islands (Koopman, 1993). The family *Megadermatidae* of the genus *Megaderma* is an ancient family of carnivorous bats which includes four genera and five species (Hill and Smith, 1984). Twenty-nine species of bats were reported to occur in Bangladesh (IUCN Bangladesh, 2000) among 123 South Asian bat species (Walker and Molur, 2003). The number of bat species in Bangladesh so far reported varied from 16 to 38 (Bates and Harrison, 1997; Sarkar and Sarkar, 1988, 2005; Khan, 2001; Molur *et al.*, 2002; Srinivasulu and Srinivasulu, 2005). The status of bat species assessed in the Red Book of Threatened Mammals of Bangladesh has just revealed the lacunae in our knowledge (83% data deficient) on this volant and least studied mammalian species. The present investigation has attempted to provide some crucial field observations on its status and distribution for the first time from Lawachara NP, Bangladesh.

Study area: The Lawachara National Park, is situated within 24°30' - 24°32' N and 91°37' - 91°39' E coordinates and is a part of the once West Bhanugach Forest Reserve. The current notified area of the park covers 1250 hectares including 281 hectares proposed area from the West Bhanugach Forest Reserve. Two ethnic Khasia villages (with 40 and 23 households) are located inside the forest since long. There are 15 houses including forest staff residences, offices and research organizations in the park areas. About half of them have been abandoned for long. These deserted houses provided a good place for many cryptic wild animals of the park including bats. The semi-evergreen forest has a rich floral diversity of about 107 plant species (Leech and Ali, 1997; Feeroz, 1999; Aziz, 2007). The canopy height of forest varies from 10 to 30 metres (Feeroz, 1999). The park area is populated with 12 species of amphibians, 27 reptiles, 93 birds, and 32 mammals (Aziz, 2007). The average maximum temperature was recorded in March (33.6°C) and the highest rainfall in June (456 mm) (Aziz, 2007).

Methods: Field visits were conducted in the Lawachara National Park between September 2005 and June 2006. Mist nets were used for trapping bats in different habitat types (Aziz *et al.*, 2007). Two 1.5 inch-meshed mist nets (20 X 12 and 10 X 30 feet) were used. These nets were deployed in the five representative areas covering forest corridor, bamboo patch, palm tree patch, ethnic homesteads (forest villages inside the park) and near forests staff houses, between 17.30 and 19.30 hours. Mist nets were deployed for seven trap nights in the above mentioned habitat types covering 22 netting hours. We netted two nights by using two nets at a time in the same study site of ethnic homesteads and forest staff house and one night with one net for rest of the study sites. Bats were collected from the net as soon as they were trapped. Bats were then measured, photographed and released immediately. A slide calipers and digital balance were used for taking measurements.

Observations: A total of seven individuals of *Megaderma lyra* were caught and five escaped from the net from two of five netting sites. The forest staff houses which have been abandoned and one house in ethnic village inside the forest were used by this bat as shelter or colony sites. The forest staff house was made up of corrugated tin sheets as roof and walls made of woven bamboo and wooden materials. Traditionally, this house also roofed with extra bamboo-woven roof under the tin to keep the house cool during hot summer. On the other hand, most of the ethnic houses were almost similar in structure except for the mud floor. *M. lyra* was found to come out from the spaces between tin shed and the bamboo woven roof. They used small opening between upper tin shed and lower bamboo-woven roof for coming out from their roost. There were, however, no trappings of this bat besides short-nosed fruit bats in the other three netting sites, viz., forest corridor, bamboo patch and palm tree patch. Brosset (1962), however, mentioned caves, temples, forts, dilapidated old buildings and underground tunnels as its diurnal roosts in India.

The greater false vampire fled out of their roost after the short-nosed fruit bat from the same house. Between 20 and 40 minutes after sunset, they came out of the roosting places. Three bats were caught near the forest staff houses and the rest four in the ethnic homesteads. The average catching rate was 1.23 individuals net/hour. The other bat species caught during this study were *Cynopterus sphinx*, and *Pipistrellus coromandra*.

The robust and stout bodied Greater False Vampire bat reacted aggressively after getting trapped in the net. The first action was to bite the entangled net around the body and then to cut it out. Surpris-
ingly, five individuals freed themselves. Its sharp, pointed incisors made it possible promptly. Observing this behaviour, I turned the net down immediately after a bat gets trapped in the net. The prominent and amazing feature was its big oval ears joined just above the forehead. Another prominent structure which characterizes and separates this species from others was its erected noseleaf with longitudinal ridges. The wings were broad. The face and upper cheeks were hairy with naked snout. The body was uniformly grey and faintly painted with brown. The average head-body length, wing span and ear length were 84.02 mm (range = 79.02 - 85.09 mm; SD = 6.03; N = 7), 421.5 mm (range: 401 - 434 mm; SD = 28; N= 7), and 39.01 mm (range: 35.02 - 42.04 mm; SD = 2.2; N = 7) respectively.

The space used as daytime roost in the forest staff house was searched with the help of local assistance. The remnants of food found out there provided some important feeding habits of this species which included legs of frogs, insects, ants, and tails of wall lizards, etc. However, an array of food items like beetles, insects, wall lizards, fishes, birds, etc., eaten was recorded elsewhere (Broset, 1962; Advani, 1981).

**Conclusion**: Present notes on the greater false vampire bat are significantly important not only as the first record from the area but also to provide information on its status and behavioural aspects. The deserted houses in the park should be maintained in their present condition. Through survey should be carried out in every possible area to know more about this least studied chiropteran fauna along with the false vampire bat of Bangladesh.

**References**


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Additional Sightings of *Pteropus* colonies in plains of Eastern Nepal
Sanjan Bdr. Thapa*

During September-December I visited some new *Pteropus* colonies at new areas of Terai (Plain) of Eastern Nepal. A population of about 2000 individuals roosting on four silk cotton trees (*Bombax ceiba*), Simal in Nepalese was found at Gadheri Tole, Prakashpur-7, Sunsari district. "The colony existed from ten years"-says Mr. Shyam Pal, the trees owner. He added, he resisted many hunters from hunting as his family takes bats leaving at his compound as Good luck. Although, two were killed for curing some patients of Asthma. He says, "But, I don't know the flying fox cures asthma or not". A group from Shantinagar, Prakashpur may have immigrated this year after the roost (simal tree) was cut down. A colony at the Mrigkunj of Koshi Tappu Wildlife Reserve, existing a few years ago has shifted there.

A population of 2000-3000 individuals stay at Jhapa, Taaghhandubba-5, formerly headquarter of Jhapa district (N 26° 17’ 35.8'', E 88° 08’ 52.8’’) at an elevation of 62m. A population of 1000-1500 individuals were seen hanging on Siris tree (*Albizia sp.*) at Kuwari Devi Tea Estate and the remaining on a Ban Peepal tree (*Sapium insigne*) aside.

The locals (Rajbanshi), an ethnic group called flying fox as chamachil. Satar, another ethnic indigenous group kills them for food and medicine. It's their favorite recipe. They remove the skin and dissect out alimentary canal, fry and mix with spices and pickles. The dish is ready.

According to Ghanshyam Choudhary, a staff at Ratuamai Reforestation Project Office, Kerkha, a small population of flying fox remains at Chitlangadh, South from Dudhe.

During my project field visit to Koshi Tappu Wildlife Reserve Headquarter, Kusaha, Sunsari, a few army men of Sri Box Coy, Kusaha informed bats presence at Nepal Army Eastern Division Headquarters, Itahari, Sunsari district. I visited the place on 8th April. The ptero-camp can be divided into three blocks viz; West-North, East-North and Southern blocks. In West-North block an estimation of 395 individuals were roosting in 22 trees i.e. 12 Sisso, six Teaks, each of Simal, Peepal, Kadam and Siris. Maximum population were roosting at Simal and Peepal trees. In East-North block around 290 individual roosts in five trees i.e. three Jamun and each of Sisso and Siris. Maximum number can be seen in Siris. In Southern block about 25 individuals were seen in four Sisso and only five in two large Simal.

Acknowledgement

**Ptero-camp at Itahari**
I would like to acknowledge family of Nepal Army, Eastern Division Headquarter, Itahari, Sunsari district, Nepal for their co-operation.

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An opportunistic survey was carried out on the roosts of Indian Flying Fox (*Pteropus giganteus*) located in different areas of Bangladesh during 2008–2009. Data were recorded on specific roost locations, and some with geographical positions, surrounding habitat types where roost trees are located along with roosting trees and roost size. We used direct and branch counting methods to determine roost size. However, present results are part of an on-going research and observations are on progress.

We have come across an array of threats to these roosts, viz., disturbance by local people, cutting down the roosting trees, unwilling to support bat roost within communities due to damage of homestead fruits, and destruction of surrounding habitats due to development of settlements and infrastructures. Mass level awareness among local people and legislative measures could help survive these roosts in the long-run.

### Notes on Indian Flying Fox (*Pteropus giganteus*) roosts in Bangladesh

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<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Location</th>
<th>Habitat types around the roost</th>
<th>GPS coordinates</th>
<th>Roosting tree(s)/bat roost</th>
<th>Roost size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vill: Khubipur Union: Khubipur Thana: Gurudaspur Dist: Natore</td>
<td>Large bamboo patches within urban areas</td>
<td>24°23'26.88&quot;N 89°15'21.54'E</td>
<td>Bambusa tulda</td>
<td>330-360</td>
</tr>
<tr>
<td>2</td>
<td>Vill: Vadash Union: Tarash Thana: Tarash Dist: Sirajganj</td>
<td>Graveyard located behind homesteads</td>
<td>24°26'8.60&quot;N 89°22'20.51'E</td>
<td>Ficus bengalensis, Bambusa tulda, Mangifera indica, Dalbergia zissoo</td>
<td>375-425</td>
</tr>
<tr>
<td>3</td>
<td>Vill: Montherpur Union: Baruhash Thana: Tarash Dist: Sirajganj</td>
<td>Bank of pond close to homesteads</td>
<td>24°28'36.65&quot;N 89°18'49.55'E</td>
<td>Eucalyptus sp.</td>
<td>45-55</td>
</tr>
<tr>
<td>4</td>
<td>Vill: Digharia Union: Baruhash Thana: Tarash Dist: Sirajganj</td>
<td>Backyard of house within homesteads</td>
<td>24°29'6.64&quot;N 89°17'25.80'E</td>
<td>Tamarindus indica</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Vill: Baranogram Union: Biyash Thana: Singra Dist: Natore</td>
<td>Near a pond within urban communities</td>
<td>24°30'33.92&quot;N 89°17'30.14'E</td>
<td>Ficus infectoria</td>
<td>125-135</td>
</tr>
<tr>
<td>6</td>
<td>Vill: Talam Union: Talam Thana: Tarash Dist: Sirajganj</td>
<td>Homesteads close to large water bodies</td>
<td>24°30'1.26&quot;N 89°19'36.46'E</td>
<td>Ficus bengalensis</td>
<td>175-225</td>
</tr>
<tr>
<td>7</td>
<td>Vill: Binojpur Union: Binshara Thana: Tarash Dist: Sirajganj</td>
<td>On the bank of a pond in village</td>
<td>24°27'0.07&quot;N 89°19'11.77'E</td>
<td>Ficus bengalensis, Borassus flabellifer</td>
<td>185-200</td>
</tr>
<tr>
<td>8</td>
<td>Boldha garden Dist: Dhaka</td>
<td>Botanical garden in old Dhaka city</td>
<td>--</td>
<td>Tectona grandis, Albizia lucida</td>
<td>170-190</td>
</tr>
<tr>
<td>9</td>
<td>Vill: Hardinz, Kathal tola Union: Dhamrai Thana: Dhamrai Dist: Dhaka</td>
<td>Fallow land close to homesteads</td>
<td>--</td>
<td>Samanea saman, Albizia lucida</td>
<td>400-450</td>
</tr>
<tr>
<td>10</td>
<td>Vill: Kandapara Union: Kaliahoripur Thana: Sirajganj Dist: Sirajganj</td>
<td>Beside pond within homesteads</td>
<td>--</td>
<td>Tamarindus indica</td>
<td>375-425</td>
</tr>
<tr>
<td>12</td>
<td>Vill: Sadarpur Union: Pathalia Thana: Savar Dist: Dhaka</td>
<td>Beside graveyard close to house</td>
<td>23°52'59.78&quot;N 90°15'31.30'E</td>
<td>Tamarindus indica, Bambusa tulda</td>
<td>180-220</td>
</tr>
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Kullu, a hilly district of northern India, also known as the valley of gods, has got so many attractions like tourism, horticulture, beautiful locations, temples, unique local culture, shawls, river beds, Great Himalayan National Park etc. The local people rear animals like sheep, goat, cattle, dogs, equines and buffaloes etc. The beautiful birds like Monal, Western Tragopan and animals like leopards, bears and Goral form an attractive component of the wild life of this area. There are also birds like crows, pigeons, and sparrows etc. which live commonly in the residential areas. At places where there is co-existence of humans and animals, we may also find human-animal conflicts of varying kinds and degrees. In this area also we observed various kinds of human-animal conflicts like human-stray cattle conflict (very common), human-stray dog conflict (very common), human-stray equine conflict (occasional), human-leopard conflict (occasional), human-monkey conflict (common), human-bear conflict (occasional), human-snake conflict (occasional) etc. In all these kinds of conflicts, people often try to resolve the conflicts in legal, humane or sometimes also inhumane and illegal ways to get rid of the problems.

Amongst all these situations of human-animal conflict in this area, we also observe a marvelous example of "living in harmony with conflict" during the time period from last week of April upto October every year.

The Fruit bats Pteropus giganteus species roost every year during this part of year at Shamshi in the campus of GHNP and Parvati forest division on the trees of Populus and Alnus species. The nearby flowing river Beas, plenty of Populus trees & enough space in the campus, fruits in the surrounding area, congenial climate and of course negligible human disturbance are the probable attractions that compel them to roost at this site every year.

These flying mammals start migrating here during the last week of April, live here for about six months and start migrating out of this location in the month of October.

Although bats do not attack human beings directly, the residents still face some trouble such as are in the form of typical continuous chap-chap noise, risk of zoonoses, soiling of the ground with bat faeces and the nuisance that they feel most unbearable is the damage to fruit crops.

The farmers feel irritated when they see the bats eating and spoiling fruits but still we do not observe anybody harming or killing the bats perhaps because they do understand their role and importance in pollination, eating insects along with the fruits and reducing breeding places for the insects (over-ripen fruits etc.) that otherwise might cause more damage directly and indirectly to the people of area in the absence of these flying foxes.

This example of harmonious living in human-animal conflict can be a sign of relief for the people working on wildlife conservation.

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Bats and People: Harmony with Conflict

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Species diversity and distribution of bat in Panchase region of Nepal
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Introduction
Bats are the second most diverse order of mammals worldwide, with close to 1,000 described species (Koopman, 1993). Although they are one of the largest groups of mammals in overall abundance, with the exception of man and possibly rodents (Nicole D, Noel S., 1977), they remain poorly studied and misunderstood in most parts of the world. They are also the most relatively inconspicuous only because they are active by night, hidden by day and wary of human contact (Malla, 2000).

The Order Chiroptera is comprised of 18 families, approximately 202 genera (Shrestha, 1997), and close to 1001 recognized species throughout the world (Koopman, 1993). In Nepal, some 50 species are known to live and breed (Walker and Molur, 2003). Bats are systematically classified into two suborders: Megachiropterans are the Old-World fruit bats and Microchiropterans are predominately insectivorous bats (Koopman, 1993). Megachiroptera contains a single family (Pteropodidae), 42 genera, and 167 species which are mainly comprised of frugivorous bats. Microchiroptera consists of 16 families, 135 genera, and 834 species. Although many microchiropterans feed on non-insect prey, all members of Microchiroptera probably originated from an insectivorous ancestor. It is worth mentioning that the taxonomy of Microchiroptera is constantly being revised, as new species are discovered and described.

Bats have been reported from almost all the geographical areas of the world, except for the Arctic, Antarctic, extreme desert areas, and a few isolated oceanic islands (Mickelburgh et. al., 1992; Hustson et. al., 2001). Bats are distributed mainly along the tropical belt of both the "Old" and "New" World, and it was probably within the tropics that they developed their present variety of species and forms. Hence, the greatest diversity of bat species is found near the Equator in the warm, tropical climates. A few families have been successful in extending their ranges into the northern and southern temperate zones. However, the number of species living in these temperate zones decrease as latitude increases.

Bats continue to be among the most misunderstood and feared animals in human society. Many people still view bats as sinister, eerie and demonic creatures. Unfortunately, this reputation has caused bats harm and ill-treatment throughout the world. This superfluous fear and superstition has contributed to the almost total destruction of several bat species, and has threatened the existence of many others (Phuyal, 2005).

Bats are natural insect predators and plant pollinators, and have been very beneficial to the human economy and the natural environment on which we depend. It has been estimated that a colony of just 150 Big Brown bats (Eptesicus fuscus) can eat enough cucumber beetles each summer to protect local farmers from 33 million root worms. These insect pests cost the United States government billions of dollars annually (Bat Conservation International). Bats also devour mosquitoes in our own backyards, and help keep vast numbers of night flying insects in balance. Additionally, bat dropping (guano) in caves supports whole ecosystems of unique organisms, including bacteria that are useful in detoxifying wastes, improving detergents and producing gasohol and antibiotics. Consequently, bats are extremely important for the economies of developing countries like Nepal.

Why BAT Conservation in Panchase?
Government of Nepal is established Department of National Parks and Wildlife Conservation area for the conservation of endangered flora and fauna. These flora and fauna are depleted day by day due to over exploitation, pollution, habitat destruction, poaching and human and livestock pressure in its habitat (MDO/UNDP, 2006). Government of Nepal is not able to protect these animals outsides of the protected area due to lack of sufficient manpower and budget and the present country situation. Panchase is one to the most important biodiversity

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hotspot of Nepal and proposed Protected Area of Nepal. Panchase forest provide significant habitat for the different flora and fauna, mostly bat. This is a most potential site for bat research and conservation which has not been documented by earlier research work. Therefore this study was to explore the present status of bat in the wild, its distribution area and local people's perception towards conservation of bat in the Panchase area. Approximately 36,759 people who live in this area (Gurung, Brahmin/Chhetri, Bishwakarma, Nepali, Pariyar and some Newar and Magar) depend on the Panchase forest for firewood/timber/livestock grazing and illegal poaching. These activities directly affect the wildlife. They think, in case of bat it is value less and they don't seems to know its importance. The habitat of bat and its fruit plants are deforested by local people for fuel wood and timber, as well as many caves of Panchase area used by livestock header. They use fire in the cave for removing bat, and making shelter for their livestock and themselves (MDO/UNDP, 2006). Therefore, the present study was able to indentify the present bat species diversity and distribution in Panchase region of Nepal which will support to further management of those species in the region.

**Table 1: Bat distribution: main potential areas**

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Place</th>
<th>V.D.C.</th>
<th>Type of Places</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alapeshor Gufa</td>
<td>Thuli Pokhari-Parbat</td>
<td>Cave</td>
</tr>
<tr>
<td>2</td>
<td>Malangdi River</td>
<td>Pipal Gachi-Parbat</td>
<td>Canal of Malangdi River</td>
</tr>
<tr>
<td>3</td>
<td>Phalebans</td>
<td>Sanakha Pokhari-9, Parbat</td>
<td>Reservoir of Phalebans canal</td>
</tr>
<tr>
<td>4</td>
<td>Tuni Khola Kalidaha</td>
<td>Wangsing-9- Syangja</td>
<td>Den/Cave</td>
</tr>
<tr>
<td>5</td>
<td>Dhundure Khola</td>
<td>Wangsing-2- Syangja</td>
<td>Sloppy Area</td>
</tr>
<tr>
<td>6</td>
<td>Tareveer CF</td>
<td>Arther Dandakharkha-6- Syangja</td>
<td>Sloppy Area/cave</td>
</tr>
<tr>
<td>7</td>
<td>Rapu Ward-4</td>
<td>Pamba Deurali-Parbat</td>
<td>Banana Leaf</td>
</tr>
<tr>
<td>8</td>
<td>Dableswara-5</td>
<td>Arther Dandakharkha- Parbat</td>
<td>Bamboo clump, Prunus tree</td>
</tr>
<tr>
<td>9</td>
<td>Bharuwaswara-5</td>
<td>Arther Dandakharkha-Parbat</td>
<td>Bamboo Clump</td>
</tr>
<tr>
<td>10</td>
<td>Tareja-4</td>
<td>Bange Phadke-syangja</td>
<td>Ceiling of live stock shed</td>
</tr>
<tr>
<td>11</td>
<td>Harpan</td>
<td>Bhadaure Tamagi, Kaski</td>
<td>Cave</td>
</tr>
<tr>
<td>12</td>
<td>Tamagi Village</td>
<td>Bhadaure Tamagi, Kaski</td>
<td>Cliff/cave</td>
</tr>
<tr>
<td>13</td>
<td>Bhadaure Deurali</td>
<td>Bhadaure Tamagi, Kaski</td>
<td>Tree roosting</td>
</tr>
</tbody>
</table>

**Table 6: Bat species diversity in Panchase region, Nepal**

<table>
<thead>
<tr>
<th>Species</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asiatic Greater Yellow House Bat</td>
<td>Scotophilus heathii</td>
</tr>
<tr>
<td>Fulvous Fruit Bat</td>
<td>Rousettus leschenaulti</td>
</tr>
<tr>
<td>Himalayan Whiskered Bat</td>
<td>Myotis siligorensis</td>
</tr>
<tr>
<td>Horseshoe Bat</td>
<td>Rhinolophus pusillus</td>
</tr>
<tr>
<td>Andersen’s Leaf-nosed Bat</td>
<td>Hipposideros pomona</td>
</tr>
<tr>
<td>Nepalese Whiskered Bat</td>
<td>Myotis muricola</td>
</tr>
<tr>
<td>Short-Nosed Fruit Bat</td>
<td>Cynopterus sphinx</td>
</tr>
<tr>
<td>Hodgson’s Bat</td>
<td>Myotis formosus</td>
</tr>
</tbody>
</table>

**Panchase Forest and region**

The Panchase Forest is located at the nexus of the districts of Kaski, Parbat and Syangja, in the western region of Nepal. Panchase Forest is a Biodiversity hotspot, a national forest, and thus owned by Government of Nepal. It is managed by the DFOs and the Ministry of Forestry and Soil Conservation (MFSC). The Panchase Forest is bordered by 10 Village Development Committees (VDCs) spread across Kaski, Parbat and Syangja Districts.

**Panchase Forest**

Panchase forest starts from 1450m to 2517m. The forest is sub-tropical and temperate mixed evergreen forest. The region is very rich in plants diversity. Red rhododendron and orchids of different species are the major blossoming plants. 400 species of orchids are found in Nepal. Out of which 112 species are available in Panchase area. Among them, 3 species are available nowhere in the world. The total area of Panchase forest is 45.93 sq km. The forest nearby the settlement and the lower part of Panchase forest has become community forest as per conservation policy. At
Figure 2: *Rhinolophus pusillus* in Panchase Cave

Figure 3: Buffalo (4 months old) horn chewing by bats
present, 68.69% forest is under protected forest and the rest of the forest managed by community as community forest. There are two patches of Panchase protected forest, one is at and around the peak and the other is in Pumdibhumdi. The panchase protected forest located in Pumdibhumdi will be converted to community forest.

Methodology: Distribution Area of Bats (roosting) in Panchase region
The distribution area was identified on the basis of direct observation, cave survey, and from interview of local herders and other knowledgeable person (key informants). These preliminary information will be vital to find out potential bat roost areas, that will also be visited later to confirm the presence of bats. In addition, the local people in the area were formally interviewed to confirm any particular bat roosts in their area. Confirmed roosting localities were recorded using a Global Positioning System (GPS) unit. (In the case of inaccessible roosts, a GPS location was taken at the closest accessible point to the bat roost). Besides, villagers were asked about their attitude towards bats, formally and informally. Conclusions concerning potential threats were drawn out at formal and informal questioning.

GIS Distribution Map
Based on GPS Point and topographical map of the project area, bat distribution maps were prepared. Data were collected during field visit, a bat distribution map of Panchase region was created using Arc GIS 9.3. (Fig. 1)

Results and Discussion
Bat Species and Distribution
Trees with roosting bats were distributed in all VDCs of Panchase region, every village of Panchase region has recorded bat in surrounding the house in late evening, especially summer time. Total 5 caves were identified but only three caves had bats in it. Other caves did not have bat because of fire inside the cave by livestock headers and MAOIST party (during political conflict time) for their shelter. Panchase forest harbours more tree roosting bat than caves roosting bats. Generally bats were distributed in all village area of Panchase region. Bats regularly come to villagers homes and livestock shed, and they are reported always chew the horns of young buffalo and cow, a reason why local people don’t like bats.

Panchase region provides important habitat of bat diversity. Because of different microclimate in Panchase region there is high diversity of bat. On the basis of field survey we found 8 species of bat in Panchase region, however, more bats should be present. An inventory is required to know the species present in this area. From the present study it can be concluded that only 10% of species found in this area has been recorded from Panchase region so future study on species diversity should be the priority research on bats for this region.

References:

Malla Rajan (2000). Diet Analysis of Hipposideros armiger and Rhinolophus pusillus (Microchiroptera) of Nagarjuna Cave. A thesis submitted to Central Department of Zoology Tribhuvan University in partial fulfillment of the requirement of the Master’s degree of Science (M. Sc.) in Zoology


Acknowledgment
We would like to acknowledge Prof. Dr. Paul for supporting identification of Bat species. We are highly indebted to Bat Conservation International (BCI), USA for providing funding for this Project.
Background

Bats are least studied and known species in Nepal. Out of 1116 species in the world only 53 species have been reported from some parts of Nepal. There are many potential sites where they have not been studied. Bat conservation in Nepal has been ignored by Government, Non-Governmental Organizations and even conservationists. Some students in parts of Nepal have started bat conservation work since 2004. There are many misconceptions regarding bats and they are often killed meaninglessly. Preliminary baseline information on bats of Nepal is limited and has not been properly documented. Conservation of these animals is only possible if it is started from the grass root level.

Project area

Palpa district is situated in the Lumbini zone of Western Development Region of Nepal. Madanpokhara Valley of Palpa District is rich in biodiversity and has an agricultural land over 2000 hectares. Along with insectivorous bats, fruit-eating bats such as Pteropus giganteus also have been roosting in that area. Other roosting sites of bats (caves and trees) are present in Palpa district, such as Siddhapani Cave, Hattilake Cave, Gure cave, Siddha Cave, Balsiddha Cave, Ridika Cave, and Siddesor Cave.

With the view of increasing awareness among students, local people, members of NGOs, CBOs, youth clubs, conservationists, volunteers, etc. an awareness campaign on bats was conducted from January 2008 to November 2008 in Madanpokhara Valley of Palpa district. Different programs were organized to make people familiar with bats. Positive impact has been observed in that area after this campaign. Now, many misconceptions related to bats have been replaced by accurate knowledge.

Objectives accomplished

1) Educate students for conservation of bats through teaching, publications, radio media and conservation activities.
2) Development and presentation of educational materials for the school children in the valley.
3) Create understanding in Palpa District about bats.
4) Provide management recommendation for future course of actions in Palpa District.

Phase I of the programme

1) Preliminary information on human attitudes and knowledge on bats was measured through a structured questionnaire/survey among students, youth clubs and community members.
2) Focus group discussions on the importance of bats were organized among community members, social worker, local conservationist, journalist, teachers, where suggestions for bat conservation were exchanged.
3) Materials on bats were developed to broadcast through different conservation related programs from two F.M. stations. Around 5 million people were reached through this programme.
4) Following articles were published in journals, magazines, newspaper, literate persons on the importance of bats.
   - “History, Importance, Status of Bats and Their Threats in Nepal” (Published In Prabhat 2007/2008, Volume 1, Publication 14, Year 15. ANNFSU)
   - “Bat Species Richness and Their Distribution in Pokhara Valley of Nepal” (Published in The Initiation 2008, SUFFREC, Volume 2, Year II)
5) 15 Students from Institute of Forestry (IoF) and other colleges from different districts throughout Nepal got of were oriented on different aspects of bats. Each was supplied with bat materials and a letter requesting school for providing one-day class.

*Coordinator of Natural Resources Research and Conservation Center (NaReCon), Email: harisubash2002@yahoo.com, narecon@yahoo.com
Phase II

1) Materials developed for Phase II were leaflets, "Bat Conservation In Palpa" and posters in English and "Bat Conservation in Nepal: An Educational Kit" in Nepali language, and posters in English language.

2) Three schools on the periphery of roosting sites of *Pteropus giganteus* were selected for teaching purpose. Representative students from Grade 5 to 10 were selected by their school. Each student was given educational materials developed for this project and additional materials supplied by CCINSA, ZOO and WILD. Students were taught about mist nets and taken to roosting areas of bats for learning bat counting, identifying threats, and describing their physical features. One full day class was conducted in each school. Essay competition, drawing competition and informal quiz were also conducted among students who were given prizes.

3) Students were assisted in making wall magazines on different aspects of bats. Group of students on bats. Introductory information was given to students, so that they could publish it in magazines.

4) During this programme we got ample opportunity to participate in assembly of guardians, which was conducted in Shree Damkada Higher Secondary Schools. During that assembly thirty minutes lectures was conducted on the importance of bats. This programme was helpful in removing misconceptions regarding bats.

5) Meetings with school headmasters of 3 schools of Palpa District were conducted with lectures on bats which had a positive impact on students. Teachers promised to provide extra lectures on bats besides their regular class in each school. Each school was given materials mentioned earlier. Especially teachers related to Environment and Science subjects were exposed to special techniques from "Bat Conservation Educator Skills Training" organised by ZOO at the Institute of Forestry in August 2008 for teaching meaningfully.

6) Impact of the overall programme was measured by using structured questionnaires both before and after the programme. Above 75% level of knowledge has been increased among this group.

Materials published and dissemination:
The materials developed were deseminated to the Department of National Park & Wildlife Reserves, Department of Parks, Recreation and Wildlife Management, research and conservation organizations working on research and conservation of mammals, around 10 other F.M. Radio of Rupendehi District, Palpa District, Kaski District and Argakhachi District, Public libraries in different areas of Nepal, Schools in Palpa District, Kaski District and Rupendehi District, Cave leaseholder in different part of Nepal, etc.

Recommendations
Broad level awareness programme on bats through radio media, television, newspaper, etc should be organized. Community based bat conservation projects should be initiated. Strict ban on deforestation and practices of using pesticides, insecticides in agricultural areas. Broad level plantation of trees should be carried out. Students and community members should act in groups to carry out conservation project for bats. Networks of bat researchers and clubs need to be formed for better sharing of findings, knowledge and information. Web pages should be designed to share information about bats of Nepal and e-discussions should be started. Communities living in the roosting areas of bats in different parts of Nepal should be organized and groups like "Friends of Bats" should be organised. Species richness and distribution of roosting sites should be identified in Palpa District as it will provide preliminary information on bats of Palpa District.

Acknowledgement:
I am indebted to Bat Conservation International (BCI): Global Grass root Award 2008 for providing me financial and technical support and Natural Resources Research and Conservation Center (NaReCon) for providing additional funds. Thanks to BCI team member, Paul A. Racey IUCN SS CSG, Sally Walker and her team at CCINSA, Dr. Allyson Walsh and team (Lubee Bat Conservancy) and NaReCon members.
Status and Conservation of Indian Flying Fox (Pteropus giganteus) Roosts in Karnataka,
A.K. Chakravarthy, N.E. Thyagaraj, and H.M. Yeshwanth

Opportunistic surveys of the roosts of Indian fruit bats (Pteropus giganteus) roosts in eleven districts of Karnataka revealed that out of 48 roosts observed, 54% were traditional roosts (Pteropus giganteus) which are more secure than smaller-sized roosts that may be formed as extensions of the main bat roosts. Traditional roosts are being displaced and disturbed, which results in the fragmentation of the original population 64.6% of bats in southern Karnataka.

In coffee, cardamom and areca plantations, severe pruning of shade trees disturbed the bats. The major threats to bat roosts, however, is destruction of habitat and tree-roosts. It is critically important to preserve existing bat roosts because bats play a vital role in the ecology of forests, seed dispersal and regeneration of forests. Many trees depend on bats for pollination and seed dispersal. Bat roosts help preserve local and indigenous elements of biodiversity. Frugivorous bats damage some fruits in orchards and farmers respond with extreme measures. Chakravarthy and Girish (2003) advocate non-lethal measures such as scaring, partially covering vulnerable portions of the canopy, use of olfaction-based repellents, erecting nets, blocking plantation, planting trap trees, etc. to divert bats from feeding on commercial fruits.

In urban areas, roost trees often include Ficus species, Delonix regia, Mango, Jackfruit, Acacia species, and Eucalyptus. In rural areas, roost trees include Ficus species, Terminalia, Casurain, Tamarind, and Eucalyptus. In all, 48 roosts in southern Karnataka have been monitored till date. The population of bats in the roosts varied from one to three thousand. There were 12 roosts varying from 500-1000 bats; 20 roosts hosting populations varying from 100 to 500 bats and 16 roosts which host within 100 bats. It is vital to conserve traditional roosts. Urbanization, widespread construction, widening of roads, tree-felling along roads and loss of wild fruits has resulted in the decline of fruit bat populations. Chakravarthy (2007), Chakravarthy et al., (2008), Molur (2007), and Venkatesan (2007) have documented the status of fruit bats in southern Karnataka. Further observations on fruit bats are in progress.

The above information was collected during Sept-Oct 2008. Some bat roosts were visited during day time and some during evening when they were about to leave the roost for foraging. Our over-all impression is that wherever cropping pattern has been changed or cardamom has been replaced with robusta coffee there is a severe impact on bat roosts. This would be due to the maintenance of shade, that is, thinning shade trees by cutting or pruning. In a few places, bats were killed for meat at their roost site itself. Some people kill bats for causing disturbance in the day with their chittering. Bat roosts in towns and urban areas are relatively safe and their number is also increasing. In fact, the original bat roosts are disturbed by different ways and their size is dwindling. There is a need to educate people about the importance of this amazing flying mammal. The role of this tiny creature in ecosystems has to be made known.

Finally, there are no bat roosts in the forest tract of Mudigere, either in the reserve forest area or in the scrub jungle.

References:


### Table 1

**Observations on bat roosts of P. giganteus in southern Karnataka, 2007-09**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Location</th>
<th>Bat Roost /tree</th>
<th>Habitat of Roost</th>
<th>Roost size</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gowdaregere, Channayapatna, Hassan (12°53'51&quot; N, 76°12'22&quot; E), road side tree</td>
<td>2. Mangifera indica trees</td>
<td>On left side of Blore - Hassan road</td>
<td>50-70</td>
<td>Temporary roosts, bats are frequently disturbed by traffic/people &amp; light.</td>
</tr>
<tr>
<td>2</td>
<td>Chilmargal Town DC's office + police station (13°18'44.35&quot; N, 75°46'15.20&quot; E)</td>
<td>Casuarina sp., Eucalyptus sp.</td>
<td>In town, Urban built up area, heavily used road &amp; residential area</td>
<td>1500-1800</td>
<td>Highly disturbed roost, jungle crows nuisance, ground littered with fecal pellets, noisy even during day</td>
</tr>
<tr>
<td>3</td>
<td>Bommendhalli, Kunigal, Tumkur (13°01'12.94&quot;N, 77°01'16.85&quot;E)</td>
<td>Ficus sp.</td>
<td>Road side tree.</td>
<td>70-80</td>
<td>Road side, disturbed, fragmented population.</td>
</tr>
<tr>
<td>4</td>
<td>Anchipura, 5 km away from Nelamangala</td>
<td>Ficus sp.</td>
<td>Road side tree.</td>
<td>50-70</td>
<td>Road side, highly disturbed by moving traffic.</td>
</tr>
<tr>
<td>5</td>
<td>Mysore Railway station (12°31'21.94&quot; N, 76°53'49.68&quot; E) (50 yrs)</td>
<td>Ficus sp.</td>
<td>Road side tree.</td>
<td>150-180</td>
<td>Temple, religious site, safe well protected undisturbed area.</td>
</tr>
<tr>
<td>6</td>
<td>Bangalore, Bugle Rock park, Basavanagudi (12°56'33.16&quot; N, 77°34'20.13&quot; E)</td>
<td>Ficus sp., Mangifera indica</td>
<td>Garden, tree groups, protected area</td>
<td>650-710</td>
<td>Main drained by BDA. Farm land before roost is undisturbed &amp; ancient one.</td>
</tr>
<tr>
<td>7</td>
<td>Padubidri, Mangalore, NH47 (12°52'09.70&quot; N, 78°50'33.22&quot; E) (5 yrs)</td>
<td>Ficus sp.</td>
<td>Night up area heavily used by traffic/human activities</td>
<td>50-60</td>
<td>Fragmented population highly disturbed.</td>
</tr>
<tr>
<td>8</td>
<td>Mangalore town, Hapmanaghatte, Mangalore-1 (12°52'09.70&quot;N, 78°50'33.22&quot;E) (50 yrs)</td>
<td>Ficus sp.</td>
<td>Tree groves amidst urban set-up.</td>
<td>50-75</td>
<td>Noisy disturbed.</td>
</tr>
<tr>
<td>9</td>
<td>Tipur town, Tumkur (13°15'12.53&quot;N, 76°28'41.48&quot; E) (5 yrs)</td>
<td>Ficus sp.</td>
<td>Outskirts of town, slightly disturbed area.</td>
<td>50-60</td>
<td>Fragmented roost, noisy, relatively undisturbed.</td>
</tr>
<tr>
<td>10</td>
<td>Malleshwaram, Railway station, Bangalore (13°00'39.10&quot;N, 77°33'42.30&quot; E) (50 yrs)</td>
<td>Ficus sp.</td>
<td>Religious site, slightly disturbed by traffic and humans</td>
<td>100-150</td>
<td>Temple, religious site, big roost with birds like Mynahs. Safe &amp; secure roost, undisturbed.</td>
</tr>
<tr>
<td>11</td>
<td>Purashanahalli / Belavanga / Doddbalapur 13°20'32.46&quot;N, 77°36'15.60&quot; E (5 yrs)</td>
<td>Ficus sp.</td>
<td>A village area</td>
<td>800-900</td>
<td>Relatively undisturbed, but threats of hunting.</td>
</tr>
<tr>
<td>12</td>
<td>Bethinagera / Nelamangala (13°05'56.51&quot;N, 77°23'13.12&quot; E) (5 yrs)</td>
<td>Ficus sp.</td>
<td>A village social forestry area</td>
<td>600-650</td>
<td>Undisturbed area, but highly threatened by hunting.</td>
</tr>
<tr>
<td>13</td>
<td>Madhipura / Nelamangala (13°05'56.51&quot;N, 77°23'13.12&quot; E) (10 yrs)</td>
<td>Ficus sp.</td>
<td>Village area</td>
<td>500-600</td>
<td>Relatively undisturbed</td>
</tr>
<tr>
<td>14</td>
<td>Byatha / Doddbalapur 13°07'32.46&quot;N, 77°36'15.60&quot; E (50 yrs)</td>
<td>Ficus sp.</td>
<td>Center of village near a temple</td>
<td>700-800</td>
<td>Disturbed by human activities, highly protected.</td>
</tr>
<tr>
<td>15</td>
<td>Andleshahalli / Doddbalapur 13°07'32.46&quot;N, 77°36'15.60&quot; E (5 yrs)</td>
<td>Ficus sp.</td>
<td>Outside the village</td>
<td>110-1200</td>
<td>Undisturbed, relatively safe.</td>
</tr>
<tr>
<td>16</td>
<td>Banavadi / Solavara 13°06'8.00&quot;N, 77°23'24&quot;E (10 yrs)</td>
<td>Ficus sp., 3 trees</td>
<td>Village area</td>
<td>1500-1600</td>
<td>Undisturbed area, relatively safe.</td>
</tr>
<tr>
<td>17</td>
<td>Betthalli / Yelahanka 13°06'27&quot;N, 77°36'00&quot;E (10 yrs)</td>
<td>Ficus sp.</td>
<td>Semi urban area</td>
<td>500-600</td>
<td>Disturbed area, with some hunting.</td>
</tr>
<tr>
<td>18</td>
<td>Giddappalya / Kunigal (13°01'12.94&quot; N, 77°01'16.85&quot; E) (50 yrs)</td>
<td>Ficus sp.</td>
<td>30 trees</td>
<td>2600-2800</td>
<td>Undisturbed, safe.</td>
</tr>
<tr>
<td>19</td>
<td>Somanahalli / Gubbi 13°01'39.28&quot;N, 76°53'20.04&quot;E (2 yrs)</td>
<td>Ficus sp.</td>
<td>NH 208</td>
<td>200</td>
<td>Highly disturbed by moving vehicles.</td>
</tr>
<tr>
<td>20</td>
<td>Bettadalahalli / Therikere / Shimoga 13°05'55&quot;N, 75°36'13.35&quot;E (3 yrs)</td>
<td>Ficus sp.</td>
<td>NH 208</td>
<td>200</td>
<td>Highly disturbed fragmented</td>
</tr>
<tr>
<td>Sl. No</td>
<td>Location</td>
<td>Bat Roost /tree</td>
<td>Habitat of Roost</td>
<td>Roost size</td>
<td>Status</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>21</td>
<td>Manasa Gangotri, Mysore University, 12°18'11.88&quot; N 76°36'45.12&quot; E (&gt;50 yrs)</td>
<td>Several species of trees</td>
<td>Inside the Mysore University</td>
<td>&gt;1000</td>
<td>Traditional roosts; undistributed, meets all requirements for bat roosts</td>
</tr>
<tr>
<td>22</td>
<td>Aranya Bhevan, University of Wood Sciences and Research Malleshwaram, Bangalore, (13°00'39.10&quot;N 77°33'42.30&quot;E) (&gt;50 yrs)</td>
<td>Several species of trees</td>
<td>Well protected, breeding occurs</td>
<td>&gt;600 &lt;700</td>
<td>Traditional roosts, undistributed bats forage long distances for food.</td>
</tr>
<tr>
<td>23</td>
<td>Birur 13°35' 51 47&quot; N; 75°58' 00, 31' E Birur- Lingadhashalli Road</td>
<td>Ficus bellerica 35m tall with well spread canopy, inside the Nagadevaru temple more than 60 years old, roost is &gt;50 yrs old, no threats</td>
<td>Well protected, breeding occurs</td>
<td>250-300</td>
<td>Traditional roost, undisturbed in the Birur town, the bats forage in the surroundings cultivated and hilly tracts covered with indigenous wild vegetation</td>
</tr>
<tr>
<td>24</td>
<td>Salapura, 13°18'32.10&quot; N; 76°14'51.89&quot;E Bana vara - Arasikere Road</td>
<td>Ficus sp. 30m tall, Road side tree, undisturbed</td>
<td>Being an avenue tree, it appears a temporary roost</td>
<td>100-150</td>
<td>An isolated, small roost, numbers although few, highly variable, surrounding vegetation not very supportive.</td>
</tr>
<tr>
<td>25</td>
<td>Arasikere town, 13°18'32.10&quot; N; 76°14'51.89&quot; E</td>
<td>Banyan tree, neem, Melia sp. Ficus religiosa trees, subject to disturbance because it's on the road side in the town, compound wall broken, cluster of trees disturbed</td>
<td>Highly temporarily, not consistently observed but traditional roost in the area, under disturbance</td>
<td>250-275</td>
<td>This is a disturbed roost, bats may temporarily roost on the cluster of trees, 8-10 numbers, need immediate protection.</td>
</tr>
<tr>
<td>26</td>
<td>Bellur cross- Hirisave, Road- Kadabhalli 12°59'00.00&quot; N; 76°43'00.00&quot;E</td>
<td>9 km before Hirisave on Bangalore-Harris town</td>
<td>Highly Temporary, not consistently observed</td>
<td>14-20</td>
<td>Appears to be a off shoot from a main traditional roosts</td>
</tr>
<tr>
<td>27</td>
<td>Bundalmutta, Bhadrav river stream in Ballehonnur town 13°14'33.43&quot;N; 75°39'14.56&quot; E</td>
<td>Banyan tree, canes and silk cotton trees at the edge of the river stream, over hanging about 20m above water</td>
<td>&gt; 1000</td>
<td>A traditional roost, not well protected although inaccessible, breeding observed, important in Malnad</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Kote Anjaneya Temple, Shimoga 13°55'20.10&quot; N; 75°34.13.35&quot; E At the outskirts of the Shimoga town Religion</td>
<td>Ficus and other species of Ficus</td>
<td>About 1000</td>
<td>A traditional roost not well protected, near Bhadrav river stream, near a temple as Well guarded</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Ginkerehalli, Arasikere, Hassan, 13°18'32.10&quot; N; 76°14'51.89&quot; E</td>
<td>In the village, a 150 yrs old Ficus religiosa tree well spread canopy, villagers are protecting the roost.</td>
<td>Ficus sp. tree, bats colonized that portion of canopy that is without foliage, breeding prevalent, roost is 12 yrs old</td>
<td>100-150</td>
<td>A traditional, well protected roost, tree holds 10-12 Apis dorsata colonies. Honey is harvested periodically.</td>
</tr>
<tr>
<td>30</td>
<td>Ramjiholly Koppalu, Gansdi, Arasikere, Hassan, 13°18'32.10&quot; N; 76°14'51.89&quot;E</td>
<td>A 250 year old Ficus religiosa tree</td>
<td>Ficus religiosa a temple tree, breeding takes place</td>
<td>150</td>
<td>The tree also parasitized by a Neem and other plant parasites. Tree is in a temple area so no shooting is done, villagers are protecting</td>
</tr>
<tr>
<td>31</td>
<td>ZARS, Mudigere</td>
<td>Ficus sp. Odar sp. Mangifera indica Artocarpus hirsutus A. indica</td>
<td>Behind laboratory building</td>
<td>1000-1200</td>
<td>Typical cardamom ecosystem, less disturbed, not followed the shade regulation practices, but hunting is seen during night not at roost site, bats have abandoned the site- heavy pruning of roosting trees and mortality due to electrocution.</td>
</tr>
<tr>
<td>32</td>
<td>Sharadamba estates, hale kote, Mudigere. Mangifera indica, Artocarpus hirsutus Ficus sp. (Basari Goni, Halasu)</td>
<td>Cardamom coffee ecosystem just 2-3 km away from ZARS.</td>
<td>Cardamom ecosystem supports roost, but Robusta coffee system affects the bat roost because of severe shade regulation</td>
<td>700-800</td>
<td></td>
</tr>
<tr>
<td>Sl. No.</td>
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<td>Habitat of Roost</td>
<td>Roost size</td>
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</tr>
<tr>
<td>33</td>
<td>Halo se estate, Mudigere</td>
<td>Silver oak, Ficus sp. (Basari, Goni, etc.)</td>
<td>Robusta coffee ecosystem</td>
<td>600-700</td>
<td>Original bat roost has been distributed by severe tree pruning (shade regulation).</td>
</tr>
<tr>
<td>34</td>
<td>Hassan town DC’s residence and hotel Ashoka</td>
<td>Eucalyptus sp</td>
<td>In town, urban built up area heavily used road school area.</td>
<td>2000-2500</td>
<td>Not much distributed releasing safe roost. Noisy even during day time particularly during mating season (sep -oct)</td>
</tr>
<tr>
<td>35</td>
<td>Kesavalalu estate Daradahalli, Mudigere</td>
<td>Ficus sp. (Basari), Artocarpus sp. (Halasu)</td>
<td>25km away from Mudigere town heavily disturbed</td>
<td>300-400</td>
<td>Planters hunt for the meat. Changed cropping situation severe shade pruning.</td>
</tr>
<tr>
<td>36</td>
<td>Bygoore estate, Chikmagalur</td>
<td>Ficus sp. (Basari, Goni, etc.)</td>
<td>30km away from Chikmagalur town</td>
<td>300-400</td>
<td>Habitat not been disturbed very ideal roost site good foraging observed.</td>
</tr>
<tr>
<td>37</td>
<td>Giri estate, Chikmagalur</td>
<td>Ficus (basari) Terminalia sp.</td>
<td>30km away from Chikmagalur town, coffee Arabica ecosystem</td>
<td>300-400</td>
<td>High elevation not much disturbed long range foraging was seen.</td>
</tr>
<tr>
<td>38</td>
<td>Byduvalli estate, Mudigere</td>
<td>Ficus (basari) Terminalia sp.</td>
<td>15 km away from mudigere town Robusta coffee-cardamom ecosystem</td>
<td>150-200</td>
<td>Robusta ecosystem holding less roost size due to severe tree pruning. People hunting for meat.</td>
</tr>
<tr>
<td>39</td>
<td>Chipregathi estate, Mudigere</td>
<td>Ficus (basari) Terminalia sp.</td>
<td>15 km away from mudigere town Robusta coffee-cardamom ecosystem</td>
<td>300-350</td>
<td>Robusta ecosystem holding less roost size due to severe tree pruning. People hunting for meat.</td>
</tr>
<tr>
<td>40</td>
<td>Mallandoor estate, Chikmagalur</td>
<td>Ficus sp. Casia sp. Mangifera indica</td>
<td>25km away from Chikmagalur town</td>
<td>700-800</td>
<td>Typical bat roost. No disturbance, no predator etc.</td>
</tr>
<tr>
<td>41</td>
<td>Sonaghattahalli, Thubkere, Doddaballapura, Bangalore rural</td>
<td>Ficus religiosa -single tree with 0.5 sq.km canopy cover</td>
<td>25km from Doddaballapura town towards west</td>
<td>800-1000</td>
<td>More than 100 years old tree with a small temple at base, public property, roost well protected.</td>
</tr>
<tr>
<td>42</td>
<td>Vishwa composit p.u college, Kempegowda road, Belur, Hassan</td>
<td>Eucalyptus sp., Tamarindus indicus, Silver oak</td>
<td>In town</td>
<td>300-400</td>
<td>Disturbed roosts the bats were a nuisance to public so tree is cut and the bats took roosting in neighbouring trees</td>
</tr>
<tr>
<td>43</td>
<td>Thungariver bridge, Thirthahalli</td>
<td>Bamboo</td>
<td>2km away from town at the edge of the river stream Bridge built in 1931 over hanging over 25 feet above.</td>
<td>800-900</td>
<td>40-50 years old, roosts appear to be safe, no disturbance. During day time noisy.</td>
</tr>
<tr>
<td>44</td>
<td>Kushal Sawmill Davanur road, near town, Banavara Hassan</td>
<td>Ficus religiosa</td>
<td>1km away from town</td>
<td>400-500</td>
<td>25-year old, roosts appear to be some well protected by sawmill owner.</td>
</tr>
<tr>
<td>45</td>
<td>Arakalgudu,Hassan,Bus stand ,Arakalgudu-Hassan road</td>
<td>Rain trees- 2 Bus stand Arakalgudu, Traditional roosts-25 years old</td>
<td>550+</td>
<td>No disturbance. Protected by public</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Srinivasapura Kolar, Near Police station</td>
<td>Eucalyptus tree-8 Near Police station</td>
<td>330-400</td>
<td>No disturbance, new and small roost.</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Kolar Town</td>
<td>Eucalyptus tree</td>
<td>Near KSRP office</td>
<td>250-300</td>
<td>New host, small hosts</td>
</tr>
<tr>
<td>48</td>
<td>Holenarasipura, Hassan</td>
<td>Ficus +rain trees -5 Govt. hospital</td>
<td>400-500</td>
<td>Traditional roost, no disturbance</td>
<td></td>
</tr>
</tbody>
</table>
Announcing Bats in Captivity Volume 1: Biological and Medical Aspects, the first of a four-volume series covering all aspects of bat care

This first volume is a comprehensive book intended for anyone maintaining bats in captivity. It comprises 44 papers by 22 contributing authors. Bats in Captivity is the only book of its kind, detailing the care of captive bats worldwide. This volume, Biological and Medical Aspects, includes a drug formulary, information on public health, anatomy and physiology, controlling reproduction, parasitology, and veterinary medicine and surgery, plus many other related subjects.

BATS IN CAPTIVITY
Volume 1: Biological and Medical Aspects
Susan M. Barnard, Editor
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Oral Findings
Chemical Restraint and Anesthesia
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Pathology: Including Necropsy Technique and Tissue Collection for the Bat Rehabilitator
Euthanasia, Parasites
Care Giver’s Guide to Calculating Drug Doses and Drug Formulary

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About the Editor
Susan M. Barnard holds a Bachelor of Science degree from the University of the State of New York. She founded Basically Bats – Wildlife Conservation Society, Inc. in 1993, and served as Executive Director until 2008. Currently retired from her position as Assistant Curator of Herpetology at Zoo Atlanta, Ms. Barnard has authored over 25 scientific papers in refereed journals and 2 book chapters. She also coauthored books on reptilian parasites and reptilian husbandry, and has appeared in numerous magazines and on television, including the National Geographic special, “Keepers of the Wild.”

A note from your Convenor, Administrator and Editor about Susan Barnard, Editor Bats in Captivity Vol. I

Hi!

I am so proud to tell you that Susan Barnard, editor of this high class book is a very old friend of mine. We are not in touch now much -- just we write to one another once in three years if we want something! When we were active friends, I was not interested in bats. And when I got interested, I didn't even think of Susan! It was only when I learned about BCI and Merlin Tuttle, I remembered Susan as she used to talk about him.

How did I meet Susan? I don't even remember but it had to be after I started living in India and working with zoos. And it was probably through the American Association of Zookeepers. However, wherever, whatever I saw her for the first time when I visited the Atlanta Zoo for the first time. I was taking a luxury tour around the United States, compliments of someone who paid for a 3 month Greyhound Bus pass for me. I used to travel on the bus at night so as to save money for a hotel and time for seeing more zoos. I'd arrange to reach a city or town morning or early afternoon, go to the zoo there and see as much as I could before the next busy. Everywhere I went people loaded me with zoo educational materials, husbandry handbooks, zoo guides, etc. and my luggage got heavier and heavier.

Susan Barnard offered me shelter in her interesting house which was filled to the brim with animals. I won't remember all but there were a variety of reptiles in glass terrariums including a very large python. There were also bats, bats and more bats. At the time (and probably now also) Susan was a bat rehabilitator, running a rescue and rehab facility for bats out of her house. She took calls from people who had bats in their house or verandah or somewhere where they didn't want them but we too scared to even run them off. Susan took them in and was nice to the people so that maybe they would have a more kindly feeling toward bats.

Susan "adopted" a zookeeper, Mr. Punderika Rao, of Mysore Zoo, giving him a membership in the American Association of Zookeepers and I believe paid his tuition fee for taking the Animal Management Course of UK. When I visited or soon after she was working on very "hi-fi" stuff ... so much so I couldn't understand it. She was several people rolled into one, a zookeeper of merit, a bat rehabilitator, an author, an researcher, a chiropterist, and a herpetologist of repute.

Susan permitted us to reprint several of her articles and handbooks over the years. Her dedication, discipline and generosity of spirit were an inspiration.

You may like to check out her website http://www.basicallybats.org/basicallybats/index.html

Sally Walker
Amazing Bat Facts from around the world
Susan Barnard (http://www.basicallybats.org/basicallybats/index.html)

A single little brown bat (myotis) can eat up to 1000 mosquitoes in a single hour, and is one of the world’s longest-lived mammals for its size, with life spans of almost 40 years.

Bats are more closely related to humans than they are to rodents. Several studies indicate that Old World fruit bats and flying foxes may actually be descended from early primates.

There are over 10,000 known species of bats, just about a fourth of all mammal species. Most of these would fit in the palm of your hand.

Most bats give birth to only a single pup each year, making them very vulnerable to extinction. They are slowest reproducing mammals on earth for their size.

The world’s smallest mammal is the bumblebee bat of Thailand which weighs about as much as a dime.

Giant flying foxes that live in Indonesia have wingspans of nearly six feet.

Bats are very clean animals, and groom themselves almost constantly (when not eating or sleeping) to keep their fur clean.

The pallid bat of western North America is immune to the stings of the scorpions and centipedes upon which it feeds.

A single colony of 150 big brown bats can protect local farmers up to 33 m or more rootworms each summer.

The 20 million Mexican free-tailed bats from Bracken Cave in Texas, eat 250 tons of insects every night. They sometimes fly up to two miles high to feed or to catch tailwinds that carry them over long distances, at speeds of more than 60 miles per hour.

These Mexican free-tailed bat mothers can find and nurse their own young, even in huge colonies where millions of pups cluster at up to 500 per square foot. The youngsters can be as curious and playful as many other animal babies.

A nursing little brown bat mother can eat more than her body weight nightly (up to 4,500 insects).

Many important agricultural plants, like bananas, bread-fruit, mangoes, cashews, dates and figs rely on bats for pollination and seed dispersal.

Tequila is produced from agave plants whose seed production drops to 1/3000th of normal without bat pollinators, such as the Mexican long-tongued bat.

Contrary to popular misconceptions, most bats have very good eyesight, have excellent echolocation so they do not become entangled in human hair, and seldom transmit disease to other animals or humans.

Fishing bats have echolocation so sophisticated that they can detect a minnow’s fin as fine as a human hair protruding only two millimeters above a pond’s surface.

African heart-nosed bats can hear footsteps of a beetle walking on sand from more than 6 feet.

Desert ecosystems rely on nectar-feeding bats as primary pollinators of giant cacti, including the famous organ pipe and saguaro of Arizona.

Bat droppings in caves support whole ecosystems of unique organisms, including bacteria useful in detoxifying wastes, improving detergents, and producing gasohol and antibiotics.

Vampire bats adopt orphans, and are one of the few mammals known to risk their own lives to share food with less fortunate roost-mates.

An anticoagulant from vampire bat saliva may soon be used to treat human heart patients and stroke victims.

All mammals can contract rabies; however, even the less than half of 1% of bats that do, normally bite only in self-defense and pose little threat to people who do not handle them.

Nearly 40% of American bat species are in severe decline or already listed as endangered or threatened. Losses are occurring at alarming rates worldwide.

Providing bat houses can help build the populations of many valuable bat species that eat many crop-damaging insects, such as cucumber and June beetles, stink bugs, leafhoppers and corn worm moths. Bat houses furnish places for bats to roost, hibernate and raise young, in addition to the dwindling number of natural sites available to them.

Red bats, which live in tree foliage throughout most of North America, can withstand body temperatures as low as 23 degrees during winter hibernation.

Little brown bats can reduce their heart rate to 20 beats per minute and can stop breathing altogether for 48 minutes at a time while hibernating. They may hibernate for more than seven months if left undisturbed, but can starve if they are awakened too many times during the winter, which causes them to run out of energy reserves before spring.

Tiny woolly bats of West Africa live in the large webs of colonial spiders.

The Honduran white bat is snow white with a yellow nose and ears. It cuts large leaves to make “tents” that protect its small colonies from jungle rains, one of 15 other species known to make tents.

Frog eating bats identify edible from poisonous frogs by listening to the mating calls of male frogs. Frogs counter by hiding and using short, difficult to locate calls.

Moths are also known to take evasive action when they hear the echolocation calls of bats, sometimes plummeting to the ground in an attempt to escape.

Male Gambian epauletted bats of Africa have pouches in their shoulders that contain large, showy patches of white fur, which they flash during courtship to attract mates.

The Chapin’s free-tailed bats have big tufts of white fur on top of their heads, which they fluff up during courtship.

Two famous bats from literature are Stellaluna, the young fruit bat from the enchanting children’s book by Janell Cannon, and Sunshine, the friendly little bat whose rescue was described in the book “The Bat In My Pocket”, by Amanda Lollar of Bat World.
Long Saga of Finding South Asian Bat Photos - still pending

It has been interesting to watch the last three or four years as we have tried to collect photographs of all the South Asian bats. We want these for our website TTMS, Threatened Taxa Monitoring System, where we put up the output of our erstwhile CAMP workshops, now replaced by GA Global Assessment workshops. In 2007, having collected fruit bat pictures and some insect bats, we were still missing 101 insectivoros bats ... a huge number which seemed almost impossible to gather. Last year 2008 we made an appeal again for photos of South Asian bats but the list was for 78 bats instead of 101. This year 2009 we found that some of the photos we gathered since 08 could not be copied so we are at 88 again. We need photos of both endemic and non-endemic insectivoros bats. If you have any of these, please send to zooreach@zooreach.org, herpinvert@gmail.com, sallyrwalker@aol.com.

We will study the photo and decide whether it is appropriate for our project before asking for the high resolution photographs by email or CD. We will negotiate over renumeration on a case-by-case basis.

**Endemic insectivoros bats**

1. Eptesicus tatei
2. Hipposideros durgadasi
3. Hipposideros hypophyllus
4. Murina grisea
5. Myotis csorbai
6. Myotis sicarius
7. Scotozous dormeri
8. Scotoecus pallidus

**For Non-endemic insectivoros bats**

9. Areillulus circumdatus
10. Asellia tridens
11. Barbastella leucomelas
12. Chaerephon plicatus
13. Coelops frithii
14. Eptesicus bottae
15. Eptesicus gobiensis
16. Eptesicus nasutus
17. Eptesicus serotinus
18. Eptesicus tatei
19. Falsistrellus affinis
20. Harpiopephalus harpin
21. Harpiopephalus mordax
22. Hipposideros armiger
23. Hipposideros cineracea
24. Hipposideros fulvus
25. Hipposideros galeritus
26. Hipposideros larvatus
27. Hypsugo cadornae
28. Hypsugo savii
29. Ia io
30. Kerivoula tenuis
31. Kerivoula hardwickii
32. Kerivoula papillosa
33. Kerivoula picta
34. Miniopterus schreibersii
35. Murina aurata
36. Murina huttonii
37. Murina leucogaster
38. Murina tubinaris
39. Myotis annectans
40. Myotis daubentonii
41. Myotis formosus
42. Myotis hasseltii
43. Myotis horsfieldii
44. Myotis longipes
45. Myotis montivagus
46. Myotis muricola
47. Myotis mystacinus
48. Myotis siligorensis
49. Nyctalus leisler
50. Nyctalus montanus
51. Nyctalus noctula
52. Otomops wughtoni
53. Otonycteris hemprichi
54. Pipistrellus abramus
55. Pipistrellus cynopterus
56. Pipistrellus kuhlii
57. Pipistrellus larvatus
58. Pipistrellus manchuricus
59. Pipistrellus paterculus
60. Plecotus auritus
61. Plecotus australicus
62. Plecotus auritus
63. Rhinolophus blasii
64. Rhinolophus hipposideros
65. Rhinolophus leisleri
66. Rhinolophus lucius
67. Rhinolophus macrostis
68. Rhinolophus pearsonii
69. Rhinolophus pusillus
70. Rhinolophus rouxi
71. Rhinolophus sinicus
72. Rhinolophus subbadius
73. Rhinolophus tricolor
74. Rhinolophus vunansensis
75. Rhinolopha hardwickii
76. Rhinolophus microphylmus
77. Rhinolophus muscatellum
78. Scotomorphus ornatus
79. Scotoecus kuhlii
80. Tadarida aegyptiaca
81. Tadarida plicata
82. Taphozous longimanus
83. Taphozous melanojopogon
84. Taphozous nudiventris
85. Taphozous theobaldi
86. Triaenops persicus
87. Tylonycteris pachypus
88. Vespertilio murinus

**Two Training Workshops for 2009**

Every year CCINSA and RLSCINSA tries to put on at least one training. For several years this has been a field techniques training, starting with bats only but morphed into bats and rodents, or Small Mammals. We also tried to have the trainings in a different country every year, focusing more on the country residents due to cost of air fare between countries in South Asia. Last year we broke with tradition and conducted an educator training in Nepal.

This year we have scheduled two workshops. The first one (planned for 7 - 11 September 2009) will be a traditional type field techniques training in Bhutan for interested forestry staff and biologists and a very few participants from other countries. Dr. Paul Racey, Chair, Chiroptera Specialist Group IUCN SSC and Michael Jordan, Environmental Consultant and Chair, Reintroduction Specialist Group, Europe and Central Asia will be the resource persons.

The other (planned for 3-7 or 10-14 August 2009) is a first time advanced taxonomy training, to be held at Madurai Kamaraj University in Madurai with Dr. Neil Furey, a Ph.D. in Conservation Biology guided by Dr. Paul Racey at Aberdeen University. His Ph.D. research prioritised conservation requirements for bat populations in Vietnamese Karst. He has worked for FFI in Vietnam for several years.

Slots for participation in either of these workshop will be few so it is necessary that you apply and make a case for your participation. Funding is not guaranteed. If you are interested please send your request to us along with a rationale of how you would use the training and also an up-to-date c.v. which should explain your background with small mammal work. Send this to ZOO, zooreach@zooreach.org, herpinvert@gmail.com and sallyrwalker@aol.com by 15 June for the Small Mammal Field Techniques training and by 15 July for the Taxonomy training. Sally Walker.
Merlin Tuttle stepping down? or just to the side, a little. Recently BCI announced that Merlin is resigning from President/Executive Director of BCI, the organisation he founded, but will remain on the BCI Board of Trustees as President Emeritus. I didn't feel bad about that because I know what kind of person Merlin is ... he is sort of a bat-oriented "Merlin the Magician" and he will never stop working for bats! I say he is a magician because it is sheer magic for someone to take on an animal group like bats and given them a totally new public image. BCI magazine, BATS, which we started also, helped a lot, but mostly is Merlin's magic - his great drive. Many many people see bats today as charming, furry (in a GOOD way), innocent, cute, and most of all USEFUL HEROES OF THE ECOSYSTEM. This is a far cry from the image bats had, as dangerous, rabies carriers, vampire bloodsuckers, witches companions, ...you name it ... anything that could be pinned on bats had been pinned. Not that bat problems are over but now we have a model for what to do with Merlin as our role model.

Hopefully now that Merlin is (ha ha) retired, he will have time to visit India and other South Asian countries and meet some of us. As we wait for this, I thought you might like to read this article about him which is being circulated by BCI.

Best wishes, Sally Walker
Convenor, CCINSA,
Editor BatNet/Small Mammal Mail

Merlin Tuttle, who founded Bat Conservation International in 1982 and spent the last 27 years building it into the leading defender of bats worldwide, is stepping back from his leadership role. Merlin is resigning as President/Executive Director on May 31. He will remain a part of BCI, assuming the title President Emeritus and continuing on BCIs Board of Trustees.

Merlin and John Mitchell, Chair of the BCI Board of Trustees, jointly expressed their confidence that “this transition in leadership will go smoothly, and BCI can look forward to impressive achievements in the years ahead”. The search for a new Executive Director has begun. BCIs current Management Team, with the support of the Board of Trustees, will oversee the organization in the interim.

This planned transition is part of BCIs Strategic Planning Initiative, begun more than a year ago to develop a blueprint to help the organization build on its successes and move vigorously into the future. Merlin has accepted a one-year sabbatical leave, beginning June 1, to pursue personal projects. He will also work on select projects with BCI, including efforts to deal with the crisis triggered by White-nose Syndrome.

Merlin Tuttle “has done more for bat conservation than anyone in history”, bat biologist Bill Schutt of Long Island University (author of Dark Banquet: Blood and the Curious Lives of Blood-feeding Creatures) said in an email. “That is something that you (and all of us) should be proud of.”

“At a time when most bat species were considered to be ugly and vile, Merlin has singularly shaped public perceptions about bats,” says Thomas H. Kunz of the Center for Ecology and Conservation Biology at Boston University. “Over the years, he has passionately influenced a host of students and colleagues around the world on the ecological values of bats”.

“Merlin,” says Mitchell, “is a pioneer. When he started, most of the world was unaware of how important and how threatened bats are. He made the rest of us aware of their great value, and that had a multiplier effect as other conservation organizations signed on”.

Merlin and BCI have had a revolutionary impact on the publics understanding of bats and their benefits in the United States and around the world. That required battling centuries of harmful myths and misperceptions. There remains a long road ahead, but the progress has been dramatic.

Merlin founded BCI in Milwaukee, Wisconsin, when he was Curator of Mammals at the Milwaukee Public Museum. The struggling organization with virtually no money was a nights-and-weekends enterprise. When he moved BCI to Austin, Texas, in 1986, that city was gripped by panic because hundreds of thousands of bats had moved into roosts beneath the remodeled Congress Avenue Bridge downtown. “Mass fear in the air as bats invade Austin,” screamed a local newspaper headline. Much of the public demanded the bats extermination.
But after a tireless education campaign that saw Merlin meeting with city officials, news media, neighborhood groups and schoolchildren, the fears gradually subsided. Today the summer emergences of 1½ million “Bridge Bats” draw many thousands of visitors each year and generate an estimated $10 million in local revenue. Now Austin proudly calls itself the Bat Capital of America.

Public understanding of bats makes so much else possible. Under Merlins leadership, BCI, through its Student Research Scholarships, small-grants programs and other efforts has supported hundreds of critical research, conservation and education projects in 76 countries from Argentina and Bangladesh to Uganda and Vietnam. Educational books, brochures, videos, audiovisual productions and classroom curricula developed by BCI and its partners are teaching facts about bats around the world. BCI workshops have taught bat-related research and management techniques to more than 1,400 biologists, wildlife and land managers and other professionals from 23 countries; many are now leaders in bat conservation.

Working with members, friends and many public and private partners, BCI sparked creation of the American Samoa National Park to protect flying foxes; helped install bat-friendly gates on more than 1,000 American caves and mines to protect millions of bats; purchased and protects Bracken Cave near San Antonio, summer home to the worlds largest colony of bats, 20 million Mexican freetails; led continuing work to ensure safe and stable water supplies for bats in arid western states; launched a major research program to mitigate the alarming number of bats killed by wind-energy turbines; and much, much more.

Merlin Tuttle has been studying bats since 1959, when, as a Tennessee teenager, he became fascinated by a colony of gray myotis at a cave near his home. While still in high school, he proved for the first time that the bats migrated between summer roosts and winter hibernation caves across much of the South. He also learned firsthand that ignorance about bats can lead to casual vandalism that kills thousands, even tens of thousands, in single incidents. Many people really were convinced back then that all bats were vampires, rabid, blind and quite likely to become tangled in your hair.

That early research grew over the years into Merlins Ph.D. dissertation in population ecology at the University of Kansas. At his request, the battered populations of gray myotis were officially listed as endangered in 1976. Largely through BCIs efforts, this species is recovering strongly and seemed almost ready for graduation off the endangered list - at least until the appearance of White-nose Syndrome on the edge of its range. (Merlin had a leading role in organizing and funding a WNS Science Priority Meeting for top scientists in New York last summer and is working with Tom Kunz of Boston University on a similar session May 27-28 in Austin).

Merlins commitment to education has never wavered. He has spoken to countless of audiences of all kinds, has appeared often on television and radio and has been featured frequently in national and international magazines and newspapers. Along the way, he became a world-class wildlife photographer - after concluding that few existing photos presented bats fairly, since the animals, usually grasped in unnatural positions, were snarling in discomfort rather than showing their mostly gentle nature.

To commemorate Merlins service to bat conservation and ensure that his devotion to education continues far into the future, Bat Conservation International is establishing the Merlin Tuttle Bat Conservation Scholarship Fund. This fund will support BCI Student Research Scholarships and Global Grassroots Conservation efforts worldwide. You can show your gratitude for all that Merlin has accomplished and make a personal difference for bat conservation by contributing to this important initiative. You can show your gratitude for all that Merlin has accomplished and make a personal difference for bat conservation by contributing to this important initiative.

Please visit www.batcon.org/tuttleScholarship or contact BCIs Department of Development at (512) 327-9721.
Field Training and Bat Exploration by Bat Friends
Niroj Man Shrestha*

Introduction:
Pokhara valley is one of the most beautiful valleys in Nepal. The beautiful mountain range, (Annapurna) as well as lakes and unique landforms lure many tourists from around the world. Receiving the highest rainfall in Nepal, the valley lies in a subtropical zone with Schima-Castanopsis as dominant forest type. Owing to its unique land features, the valley abounds with caves, crevices and dens harbouring potential roosts for bats. Despite the relatively small area from the valley there are altogether 11 species of bats recorded from there. Researchers have claimed that there are more yet to be explored. Abundant foraging species are primarily (Peepal, Bar, Khanyo, Nimaro) may also be responsible for Chirotepteron species richness.

Birendra Cave is located at North-East from Mahendrapool, the central hub of the Pokhara city. The place can be reached within 30 minutes of travel by local bus. The cave is situated by the river and made up of limestone. Opening is about 2.5m wide and about 120m in length. There is very airy space just inside the entrance which narrows as one continues along the cave. At the right side the entrance cave divides into another moderate space with a narrow opening. The presence of certain debris suggests evidence of water flowing inside the cave. This cave is not as famous as Mahendra Cave though it is very interesting and local as well as outside people visit the cave for recreation.

Putali cave is five minute away from the Birendra cave. The Putali cave is made up of limestone, conglomerate, silicate and sandstone with a continuous flow of water just inside the entrance. The opening is very narrow so it is quite difficult to enter but is interesting and full of adventure. Visitors to the cave have to crawl through at times. After 20 minutes (about 200 meters) divides into right and straight paths inside which are yet to be accessed because of want of light.

Objectives:
· To impart field technique about capturing and handling of bats
· To identify resident cave species
· To estimate bat population

Methodologies:
Before field visit a general introduction concerning bats was delivered to the six participant trainees. They were instructed in handling of equipment, precautions and other measures to be followed during bat capture and handling for identification and other purposes in the field. At noon we reached the Birendra Cave and bats were captured with Butterfly net as well as weighed and sexed; Face, color, tail and thumb were observed; also forearm, foot length, and wing span were measured. Hence, using external morphology and keys as well as referring the book “Bats of the Indian Subcontinent” by Paul J J Bates and David L Harrison, Published by Harrison Zoological Museum in 1997, bat

*Coordinator, Bat Friends, Institute of Forestry, Pokhara, Nepal; e-mail: batfren006@hotmail.com
species was ascertained. After identification bats were freed.

Population count is arduous task for bats because of want of appropriate equipment like infrared camera trapping. One of chief methods to estimate population of bats’ colony inside cave is polygon count but due to upsetting of light, the bats were flying with fear so we failed to follow this method also. At last each was estimated the population intuitively then averaged our totals to get a final result.

Equipments used:
Butterfly net, head lights and lights, bat bags, cruises, gloves, scales, tapes, balances, digital camera, field guide books etc.

Results:
Altogether five bats were captured from both caves. Given Table describes morphology of captured bats.

Conclusion:
Among four bats captured from Birendra cave, there were two male and two female and a single male from Putali cave. All of them were Hipposideros armiger with estimated population 300 and 250 respectively. Hence both caves harbor same species of bat i.e. Hipposideros armiger with total population 550.

Acknowledgements:
To accomplish this program we were instructed by different experienced individuals. Prof. Dr. Paul A. Racey for advising us to capture and to handle bats; Mr. Raj Kumar Koirala for kind cooperation; Institute of Forestry for providing us required equipments; local people for assisting us to enter and find location of the caves and visitors for ushering us to the Putali cave so; we are highly indebted to all.

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<td>Fore arm (mm)</td>
<td>92</td>
<td>87</td>
<td>There was a hole on wing so we released it as soon as captured without measurements</td>
<td>Face, color, and body structure resembled to previously measured bats so identified as previous species and released without any measurements</td>
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Weighing and identifying
Progress of ongoing Project PteroCount

www.pterocount.org
Sanjay Molur*

PteroCount has increased to 92 people having registered and 20 providing consistent roost information. Over 200 roosts have been reported till now from three countries in South Asia, e.g., Bangladesh - 13; India - 186; and Nepal - 9.

Roost information is now available in India for 12 states, all thanks to PteroCount volunteers. The output per Indian state follows, also going by the order of roost identified and monitored by volunteers:

Andhra Pradesh - 4; Assam - 11; Gujarat - 4; Himachal Pradesh - 16; Uttar Pradesh - 1; Karnataka - 86; Kerala - 36; Madhya Pradesh - 1; Maharashtra - 2; Rajasthan - 9; Tamil Nadu - 8; Gujarat - 8.

Dr. Sharoukh Mistry, an Indian battery now teaching at Boston University in USA had conceived the idea of volunteer monitoring of fruit bat roosts over time. Dr. Mistry has been a good source of information and encouragement to CCINSA over the years, having come over and taught at one of our training workshops in Bangladesh and generally keeping in touch. Sharoukh asked CCINSA for help in organizing this project and in January 2005, it got off the ground. A website was started where all the volunteers could see the progress, project details, new volunteers, methodology for population estimation and download data sheets.

Project PteroCount maintains data supplied by volunteers as well as extracted from publications with all sources of information or contribution fully credited. All roosts with GPS information are being mapped on Google Earth Plus. We hope to get more active in lobbying in localities where bat roosts have been destroyed as a result of developmental activities. We need a larger group of ACTIVE volunteers, including those who enrolled eagerly when the project was initiated. PteroCount invites you to register in this unique volunteer project and provide information for documenting roost sites and population trends so that bats will get better protection in future.

Names of ACTIVE volunteers

**BANGLADESH**
Aziz, Md. Abdul, Jahangirnagar University, Dhaka, Bangladesh
Kabir, Kazi Ahmed, University of Bangladesh, Dhaka, Bangladesh

**INDIA**
David J., Patrick, Bombay Natural History Society, Maharashtra
Davis, Ansa, Kerala
Dutta, Hiren, Assam
Kolipaka, Shekar Srinivas, Society for Nature Conservation and Education-India, Andhra Pradesh

**NEPAL**
Acharya, Pushpa Raj, Tribhuvan University, Nepal
Subedi, Tulsi Ram, Bird Conservation Nepal, Nepal

Ravichandran, B., Zoo Outreach Organisation, Tamil Nadu
Reginald L., Joseph, SACON, Tamil Nadu
Saif, Mohd Umar, Theocratic Geographic Society, Uttar Pradesh
Tiwari, Satyendra, Madhya Pradesh
Varu, Shantilal, Gujarat
Venkatesan, Aravind, Karnataka

Mehra, S.P., Rajasthan
Molur, Sanjay, Zoo Outreach Organisation, Tamil Nadu

Muthuandavan, Latchoumanan, Gujarat Institute of Desert Ecology, Gujarat
Parbat Singh, Rajasthan
Paul, Sanjeev Kumar, Veterinary Polyclinic, Himachal Pradesh
Phukan, Debojit, Megamix Nature Club, Assam

*Deputy Director, ZOO Coordinator, PteroCount

Sanjay Molur*
Recent Observations of Nicobar Tree Shrew *Tupaia nicobarica* (Zelebor, 1869) on Great Nicobar Island

Satish Pande*, Niranan Sant, and Shivkumar Pednekar

The Nicobar Tree Shrew *Tupaia nicobarica* (Zelebor, 1869) (*Order: Scandentia, Family: Tupaiidae, Subfamily: Tupainae*), is a small mammal species endemic to India and its distribution is restricted to Great Nicobar and Little Nicobar islands (Corbet and Hill, 1992; Alfred et al, 2002, 2006a & b; Molur et al, 2005). Since entry to Nicobar islands is restricted and is allowed only after tedious formal permissions from government authorities, and considering the logistics involved, any recent records of poorly known, endemic and endangered species like Nicobar Tree Shrew are valuable. In this communication, we report our recent observations of this species, supported by photograph taken in its wild natural habitat on Great Nicobar island.

**Observations**

On 11.01.2007 at 09.00 am, during the avifaunal survey of Andaman and Nicobar islands (Pande et al, 2007), we came across a pair of Nicobar Tree Shrews on Great Nicobar island on the East-West Road about 12 km from Campbell Bay (7° N, 93°54' E). The pair was seen on a fruiting tree in the rainforest in the lower canopy on the edge of a ravine through which a perennial mountain stream was flowing. Author (SP) photographed the species. The pair was quite active and the two members were seen chasing each other. They were observed walking over branches and were seen preferably keeping to the shady parts and were not observed to leap. They were seen eating fruits. The pair soon disappeared as they moved away to another tree. The species was not seen again during our entire survey along a line transect of 45 km on this island. It should be stated here that we did not specifically search for it, since we were concentrating on avifaunal survey. It is likely that we could have overlooked some treeshrews.

**Identification**

The features that point to the identification of the species from photograph match with the published descriptions. (Prater, 1971; Menon, 2003; Alfred et al, 2002, 2006). The present photograph taken by the author (SP) appears to be the first detailed visual documentation of this species in the wild in its natural habitat on Great Nicobar island.

**Threats, protection measures and recommendations**

This Indian endemic species is listed in C.A.M.P. 1997 as Endangered (EN-b1, 2c); IUCN, 2003, Endangered (EN-b1+2c); but is not included in WL(P) Act, 1972 (as amended up to 2003 (Alfred et al, 2006, a & b, and is facing high risk of extinction (Molur et al, 2005). The Nicobar Tree Shrew is protected under CITES: Appendix II and the region where it occurs is a part of the Great Nicobar Biosphere, hence the habitat is protected. The threat to this species are quantitative and qualitative habitat loss at the rate of <20% decline in the last 30 years and a predicted rate of >20% during the next 10 years due to agriculture, change in land use pattern, human settlements, introduction of domestic mammals, predation by dogs and cats and natural disasters like tsunami (Molur et al, 2005; Pande et al, 2007). There is nothing much known about its nesting, reproductive biology, feeding behaviour, interspecific relationships, etc. There are no captive stocks of the Nicobar Tree Shrew. Research, management and conservation measures like systematic surveys, taxonomic studies and identification of new protected areas are previously recommended (Molur et al, 2005). Knowing the threats to the Nicobar Tree-Shrew, particularly with newspaper reports of plans of Ministry of Tourism, of opening some of the Bay Islands for tourism, we feel that this endangered species needs to be included in the appropriate schedule of WL(P), Act, for its long term conservation on a priority basis.

**Acknowledgement**

We gratefully thank Vice Adm. M. P. Awati (Retd.), Chairman of Ecological Society, Director General Coast Guard Vice Admiral F. Contractor, Inspector General S. K. Sharma, Andaman and Nicobar Islands, Comdt. Rakesh Makwana CO, CGS Kanaklata Barua and his competent and helpful staff, Comm. S. B. Mishra, Chief Staff Officer, Operations, Indian Coast Guard, Port Blair, Andaman & Nicobar Islands, for making this expedition possible. We thank Dr.

*ELA Foundation, C-9, Bhoslae Park, Sahakarnagar-2, Pune, 411009 EMAIL: pande.satish@gmail.com*
M. S. Pradhan (Retd.) Mammologist, Dr. S. S. Talmale and Dr. Anil Mahabal, from Zoological Survey of India, W. R. S. Akurdi, Pune. We thank Satish Ranade, Prashant Deshpande, Premasagar Mestry, Dr. Vaibhav Deshmukh and Dr. Sanjay Kharat of Ela Foundation for participating in this survey with the authors.

References:


On 23rd May 2007 I saw about eight Jungle Striped Squirrels *Funambulus tristriatus* running around in our backyard at Kodanad. Kodanad is a beautiful village about 50kms east of Kochi, situated on the banks of Periyar River. It is located at about 23.46kms from Thattekkad and 4kms from Malayattoor forest. My house is situated on a hillock, one side of which is rubber plantation and on the other paddy fields. In my backyard we have various trees and shrubs like coconut, mango, guava, water apple, mulberry, papaya, etc. Squirrels frequent my backyard as these trees provide food and dwellings for them.

On this particular day they were found to be unusually active. Seeing the frantic manner in which they were scurrying across the ground gave an impression that they were juveniles busy playing some game. Then I noticed them scampering all over the *Ixora* and other bushes sniffing and looking around for something. The whole behaviour looked very unusual. I had seen them behaving exactly in the same manner a few days ago. They were running in frenzy, climbing half way up the trees and plants sniffing and looking around as if they were searching for something. I thought they were scared of some predator though I could not locate any.

About midmorning these squirrels were still active in the backyard, so I decided to take a few pictures. One female squirrel (identified as such by the absence of external genitalia) became aware of my presence only after it came very near to me. As it was usual in their behavior it stood still for a few seconds looking at me. Just then a male squirrel (identified as such by the presence of male genitalia) approached it and it seemed the female was taken by surprise. It did try to run, but the male was quick for her and soon they were found copulating. The whole procedure lasted for exactly 2 minutes and 20 seconds. Soon another male approached the mating pair and snarled at them. They did a somersault and were disentangled. The other male tried to approach the female, but it scooted off to a nearby tree. By then three more males came, and they were sniffing here and there searching for the female. It seems like there are very few females compared to males in our place.

This observation is of interest as this is a clear indication about the breeding season of this less known and endemic species of squirrel in Western Ghats.

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*Mating behaviour of Jungle Striped Squirrel *Funambulus tristriatus* at Kodanad, Ernakulam District, Kerala

Smitha.K.Komath*

On 23rd May 2007 I saw about eight Jungle Striped Squirrels *Funambulus tristriatus* running around in our backyard at Kodanad. Kodanad is a beautiful village about 50kms east of Kochi, situated on the banks of Periyar River. It is located at about 23.46kms from Thattekkad and 4kms from Malayattoor forest. My house is situated on a hillock, one side of which is rubber plantation and on the other paddy fields. In my backyard we have various trees and shrubs like coconut, mango, guava, water apple, mulberry, papaya, etc. Squirrels frequent my backyard as these trees provide food and dwellings for them.

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This observation is of interest as this is a clear indication about the breeding season of this less known and endemic species of squirrel in Western Ghats.

Photos: Chasing and copulation behaviour of *Jungle Striped Squirrel Funambulus tristriatus*

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*Smitha.K.Komath*

*Nediyara House, Kuruchilakode, Kodanad P.O., Perumbavoor.*
e-mail: smithakkomath@gmail.com
Sighting of Long-eared and Indian Hedgehog at Morkhakhra - (Khanpur Range, Panchmahals) Gujarat
Virag R Vyas, Jayendra J Lakhmapurkar and Deepa Gavali

Three species of hedgehog namely long-eared hedgehog (Hemiechinus auritis Gray), Indian hedgehog (Hemiechinus micropus Blyth) and Madras Hedgehog (Hemiechinus nudiventris Horsfield) are reported from India. According to CAMP workshop on Status of South Asian Non-Volant small mammals, the first two species are categorised as Least Concern, while the Madras hedgehog is identified as Near Threatened (Molur et al., 2005).

In India hedgehogs are confined mainly to the dry desert zone of Kutch, Punjab and parts of Rajasthan (Krishna and Prakash, 1955), Uttar Pradesh (Kumar and Pandey, 1994) and Saurashtra (Singh, 2001). In Gujarat long-eared hedgehog has wide distribution and reported from Palanpur, Deesa and Kutch (Acharya 1949); Amreli, Bhabhav, Bhuj, Naliya, Great Rann, Junagadh, Porbandar and Mehsana (Molur et al., 2005). Long-eared hedgehog was also reported from Narayan Sarovar Wildlife Sanctuary and areas in Banaskantha (GES et al., 2002). Indian hedgehog is widely distributed in Gujarat (Singh, 2001) reported from Banaskantha, Deesa, Kachchh, Bhuj, Junagadh, Patan, Rajkot, Surendranagar (Molur et al., 2005).

The Indian hedgehog is light coloured and has parted spines on its head. Its back and flanks are covered with closely set spines. They feed on fruits, insects, worms, rodents and lizards. They cover long distance in search of food (Prater, 1971). Long-eared hedgehog is dark grayish in colours. It can be easily distinguished form the former by presence of long and prominent ears. Hedgehogs generally inhabit dry plains and deserts. They shelter by day in the holes in the sand, or beneath thorny bushes or tufts of grass, coming out to feed at dusk and retiring at dawn (Prater, 1971).

During night surveys carried out in the forests of Khanpur range, Panchmahal district (23°21'812" N and 73°37'446" E) between 13th July and 14th July 2006, both the species of Hedgehog were observed. The exact location is close to village Morkhakhra and Ditwas in Panchmahal district, which is close to Rajathan boundary (Figure 1). State highway traverses through the area connecting Central Gujarat to Rajasthan. The traffic mainly comprises of movement of goods across the state and local jeeps ferrying people from one village to another. During the survey a total of five individuals were sighted, which included three individuals of Long-eared hedgehog (Hemiechinus auritis) and two of Indian hedgehogs (Hemiechinus micropus). The sighting of both the species indicates that the habitat preference of both the species is same. The terrain of the area was flat and the substratum comprised of clayey soil. The vegetation was thorny bushy type with Zizyphus sp. and Prosopis juliflora as the major species. The other floral components were Cassia tora, Calotropis gigantea, Ipomeae fistula, Cyperus eraculatus etc. The major crops grown in the area are maize and rice.

Long-eared hedgehog were moving along the road and feeding on the insects which came out just after few showers of rain. The activities of the individuals were closely observed from a distance of 7 mts. They could sense our presence at distance of about 4 mts. and immediately took shelter in the bushes of Zizyphus sp. nearby. They remain hidden within the bushes until they sense that no one was around them. The feeding was active between 23.30 to 01.30 hrs.

A dead individual of Long-eared hedgehog was also sighted during the day on the road, probably hit by a fast moving vehicles. On interactions with local tempo and truck drivers it was revealed that both the hedgehogs are commonly observed during late summers and monsoons feeding along the roadside. They also revealed that due to heavy traffic in the area and slow movement of the animals, both the long-eared and Indian hedgehogs are prone to road...
kills. Till date threat to the species have been identified as poaching or unknown (Molur et al., 2005), but the report of road kill is documented for the first time. There is possibility of such threats being prevalent in other parts of the country, where the species is reported in large numbers.

For conservation of the species it is requisite to educate the local drivers on the importance of this species. Apart from this some safety driving practices should be encouraged like creation of speed breaker at critical points and hoardings indicating presence of the species.

Acknowledgments: We are thankful to Gujarat Forest Research Institute, Gandhinagar for sponsoring the project on survey of small mammals in Central Gujarat.

References:


Occurrence of Indian Bush Rat (Golunda ellioti) and Spiny Field Mouse (Mus platythrix) in Tiruchirappalli district, TN, India

P. Sakthivel and P. Neelanarayanan* 

Rodents constitute the largest order of existing mammals, not only in the multiplicity of taxa but also in the enormous swarms of individuals, this group stands out among all mammals (Agrawal and Prakash, 1992). India is endowed with diverse ecological conditions hence, the rodent fauna is fairly varied. According to Corbet and Hill (1986), it is represented in India by four families, 43 genera and 99 species. The earliest consolidated account on Indian rodents are reported by Blyth (1863), Jerdon (1867), Sterndale (1884) and Ellerman (1961). Rodents belonging to 29 families are found in the world and of them four families namely Sciuridae, Muridae, Dipodidae and Hystricidae occur in India. Of these, the family Muridae is the largest family and represented in India by 28 genera and 68 species; family Sciuridae by 12 genera and 29 species; family Dipodidae by one genus and one species; and family Hystricidae by 2 genera and 3 species (Agrawal, 2000).

Distribution:
Golunda ellioti is found practically throughout India in suitable habitats. Further, it is also reported from Pakistan, Nepal, Sri Lanka and SE Iran (Missone, 1990). In Tamil Nadu, this species has been reported to have found in Salem and Madurai areas (Agrawal, 2000).

It is a rat of jungle and forest, but many venture into cultivated lands. A favourite habitat is bush and scrub jungle. It is a slow moving creature, which in its quest for food follows regular beats and makes little paths or "runways" from its nest to its feeding grounds (Prater, 1971).

Mus platythrix has been reported from some parts of Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Rajasthan and West Bengal. As far as Tamil Nadu is concerned this species has been reported only from Nilgiris.

The present study was carried out in Puthanampatti, Vellakkalpatti, Thirupattur and Siruganur of Tiruchirappalli district (10°11.30'N ; 77°45' - 78°50'E). The Tiruchirappalli district has both fertile and comparatively dry tracts for crops cultivation. The present study was carried out in the dry tracts of Tiruchirappalli district.

In the chosen study area the burrows of rodents were searched with the help of local and experienced rodent trappers. The identified burrows were studied visually as to their structure, nature of burrow entrances and their surroundings as suggested by Prater (1971) and Neelanarayanan et al., (1996). Then the burrows were dug out and the occupant rodent was trapped alive. The trapped rodents were brought to the laboratory and anaesthetized. The keys suggested by Agrawal (2000) were used for identification of trapped rodents.

Diagnosis:
Golunda ellioti is a medium - sized rat, having the tail shorter than head and body; hindfoot varies from 21 to 28 mm. Outer digits of hindfoot and 5th finger is shortened; ears are moderate in length, mammae are 4 pairs. Its burrows were observed under bushes near to cultivated fields. Further, the "runways" from its nest to its feeding grounds were also observed. The observations on the morphology of the animal and burrow made in the present study corroborate the earlier report by Agrawal (2000) and Prater (1971).

Mus platythrix is a medium - sized mouse (head and body length 95 ± 13 mm), having a short tail. Fur spiny. Colour of body dusky to dark brown above, white below; tail bicolour, dark above and paler below; hindfoot white; mammae 5 (3+2) pairs (Prater, 1971 and Agrawal, 2000).

In the Deccan these spiny mouse live in burrows of moderate depth. After entering into the burrow the animal closes the entrance with small pebbles. The sleeping chamber may also be furnished with a bed of pebbles (Prater, 1971). Similar observations were made during the present study. The observations on the morphology of the animal and burrow made in the present study are in accordance with keys given by Prater (1971) and Agrawal (2000).

During our research work on rodent species composition of a portion of Tiruchirappalli district, we found these two species of rodents. It is worth mentioning that these two species have not been reported hitherto from this part of Tamil Nadu hence it is deemed that occurrence of these two species in this area is a new site record.

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Opportunistic Scavenging by Lesser Bandicoot Bandicota bengalensis (Gray & Hardwicke) in Gulab Bagh Zoo, Udaipur, Rajasthan
Satish Kumar Sharma

On May 12, 2008, while inspecting cages of the zoo, amidst Gulab Bagh, Udaipur, Rajasthan, I found that nocturnal, Lesser Bandicoot (Bandicota bengalensis) were freely sharing food in broad day light with caged animals. They were pilfering grains of maize and bajra from “walk in aviary” and pakshi-ghar (bird house). While observing birds of pakshi-ghar through wire mesh, I noticed a full grown Bandicota bengalensis lifting and carrying a big piece of a fish in its hole. After lapse of few minutes, I noticed one more rat pilfering a big piece of flesh in same manner. A third rat was seen feeding on a big piece of flesh in open space. Since piece was heavy, hence it was not possible for the rat to pull it in its hole like others.

Greylag Goose (Anser anser), Comb Duck (Sarkidiornis melanotos), Common Coot (Fulica atra), Great White Pelican (Pelecanus onocrotalus), Spot-billed pelican (P. philippensis) and Greater Flamingo (Phoenicopterus ruber) are the inmates kept in the pakshi-ghar. Besides grains and leafy material, fishes and their body pieces are also offered to the birds everyday. Lesser Bandicoot share both vegetarian and non-vegetarian food with inmate birds. Caretaker of the cage told me that Lesser Bandicoots regularly feed on flesh of fishes in pakshi-ghar and flesh of buffalo in cages of carnivorous animals.

Lesser Bandicoot is normally a nocturnal rodent which feeds on grains, succulent shoots, roots, leaves, tubers and fruits (Roberts 1997).

Though, primarily Lesser Bandicoot is a vegetarian rodent but it also feeds on Fiddler Crabs Uca spp. and Fresh Water Crab Paratelphusa spinigera (Roberts 1997). Feeding on flesh of fish and buffalo is an addition to its dietary. In Zoos, this rodent behaves like a diurnal creature (Sharma 2006) and becomes an opportunistic flesh eater.

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(combined) BAT NET - CCINSA Newsletter and Rat-A-Tattle - RISCINSA Newsletter

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43
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**Chiroptera Conservation and Information Network of South Asia (CCINSA)**

CCINSA is a network of South Asian Chiroptera specialists, educators and enthusiasts. The network aims to enhance communication, cooperation and collaboration among chiroptera specialists of this region and thereby create a chiroptera conservation "community" for better biodiversity conservation.

Chair: Sripathi Kandula  
Convenor and Administrator: Sally Walker  
Red List and Technical Expert: Sanjay Molur

**Rodentia, Insectivora, and Scandentia Conservation & Information Network of South Asia (RISCINSA)**

RISCINSA network of South Asia was suggested by interested biodiversity conservation specialists and the purpose of this network is to link together rodent field researchers and their field knowledge throughout South Asia (Bangladesh, Bhutan, India, Nepal, Maldives, Pakistan, Sri Lanka and Afghanistan) so the pooling of information can lead to conservation action.

Scientific Chair: Sujith Chakravorty  
Editor: Sally Walker

**International Partners of CCINSA and RISCINSA**

- **Chester Zoo Conservation Fund** supports ZOO/CCINSA office, BAT NET newsletter and training in field techniques for bats. Chester Zoo, which has an outstanding facility for exhibition & breeding of bats and an active conservation interest in chiroptera is located in Upton on Chester in England and administered by North of England Zoological Society. See their excellent website: [www.chesterzoo.org](http://www.chesterzoo.org)

- **Bat Conservation International (BCI)** is one of the most active, innovative and respected bat conservation organisations in the world. See BCI’s wonderful website: [www.batcon.org](http://www.batcon.org)

- **IUCN SSC Chiroptera Specialist Group (CSG)**

  CCINSA represents the IUCN SSC Chiroptera Specialist Group in the region of South Asia. CSG utilises the CCINSA Network to locate specialists in different subject areas, to organise training as well as conservation assessment workshops and other activities to assist the CSG in their mission. Contact:

  Chair Paul Racey: p.racey@abdn.ac.uk

**RISCINSA network is supported by the Knowsley Safari Park, North England, United Kingdom.**

Small Mammal Mail is bi-annual Newsletter celebrating the most useful yet most neglected Mammals for CCINSA & RISCINSA -- Chiroptera, Rodent, Insectivore, & Scandens Conservation and Information Networks of South Asia

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Note: ZOOS’ PRINT Magazine, Journal, Newsletters and a variety of reports can be found on our websites: [www.zooreach.org](http://www.zooreach.org) and [www.zoosprint.org](http://www.zoosprint.org).

**Small Mammal Mail, C/o Zoo Outreach Organisation**

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