



BAT NET NEWSLETTER

Newsletter of the Chiroptera Conservation and Information Network of South Asia

CCINSA and the IUCN SSC Chiroptera Specialist Group of South Asia

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of great interest ...

Dr. M.M. Hassan of Pakistan is one of the few bat researchers in Pakistan. Some of you met him last year in our training in Nepal. He has sent a newspaper report of his new and very important grant for studying human/animal conflict between bats and (particularly) farmers in Peshawar and adjoining areas of North West Frontier Province. He commented that hundreds of bats are either poisoned or shot in each fruiting season. Since awareness among the people about the positive role of these bats is appallingly low the number of Mega bats is declining sharply in these areas. It seems that merely the fact he has started a research project on the topic has drawn attention of farmers and others in the area who have begun contacting Hassan in this regard. Hassan requested suggestions to help him create a sound strategy for developing a sustainable conservation economy in the region. If you have suggestions please email Dr. Muhammad Mahmood-ul-Hassan, drmmhassan@uvas.edu.pk

Hassan's email also went to Dr. Merlin Tuttle, a very experienced bat scientist, advocate and founder of Bat Conservation International. He has sent some very good remarks to us for which I requested permission to reprint in Bat Net. Dr. Tuttle agreed and his comments are below:

"It would be helpful to know what damage the farmers claim is being done and what crops are reportedly harmed. Then at least a brief study of the real situation would be in order. Bats that pollinate durians are often persecuted because the petals drop right after pollination, and the farmers think crops have been harmed when the opposite is true. Fruits like mangoes need to be picked at least seven days before they're ripe enough to eat in order to be transported to markets without spoilage. Flying foxes enter the orchards and eat mangoes that ripen on the tree, but these are ones that have ripened prematurely relative to the harvest or ones that have been missed by pickers, and so have no commercial value. In Kenya, I found that much damage to green mangoes was blamed on bats when, in fact all such damage was caused by monkeys. By considering when the fruit is appropriate for harvest, and by examining tooth marks on damaged fruit during harvest, we sometimes find that the bats are doing more good than harm. If fruit missed by pickers remains on the trees it can become a breeding ground for fruit flies and fungi that do damage crops. It helps to document clearly what the problem is if there is one. Only then can we help with education or with solutions to prevent harm."

Merlin D. Tuttle, President and Founder
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Some of us in CCINSA have tried lobbying the Ministry of Environment and Forests, Government of India for more appropriate legislation on bats. In India most fruit bats are declared as vermin on the Wildlife Protection Act, so there is no legal restriction on shooting or poisoning bats. A couple of years or so ago, two species of bats were put under a protected category out of 123 bats, many of them are threatened. During more than one discussion, in which we used some of the arguments Dr. Tuttle mentioned in his remarks, the policy makers asked if the research had been done in India! and said that they needed results from studies done in this country. Perhaps many countries' policy makers – walking a tightrope between the conservation lobby and the agricultural lobby would say the same ... at least for postponing the decision.

I would like to think that CCINSA would take Dr. Tuttle's remarks as a challenge to undertake research of this kind, research proving that bats do more good than harm. There are models for such research in other studies carried out in other countries, many of them explained in articles in BCI's magazine BATS, which is available on the BCI website www.batcon.org.

Thanks Merlin – you are right. We'll do our best.
Convenor, CCINSA



First record of Blyth's Horseshoe bat *Rhinolophus lepidus* Blyth, 1844 from western Gujarat, India

K R Senacha*

NOTE: please refer to website version of this newsletter for colour photos which accompany and illustrate this article. SRW. Ed.

Abstract:

Blyth's Horseshoe bat, *Rhinolophus lepidus* though have been reported widely across Indian subcontinent its distribution remain unknown in the western part of the Thar desert. Recent sighting of this species in Kachchh district of western Gujarat adds to its distribution in extreme west of the Thar Desert in India.

Key Words: Distribution, Blyth's Horseshoe bat, Gujarat, India

Introduction:

Blyth's Horseshoe bat, *Rhinolophus lepidus* (Blyth, 1844) (Order Chiroptera: Microchiroptera: Rhinolophidae) is endemic to South East Asia and distributed widely across the Indian sub-continent. Within India it is widespread with its known distribution in 15 states (Fig. 1). Though in western India it has been reported from Rajasthan (Prakash 1963; Sinha 1979; Senacha, 2003), Madhya Pradesh (Wroughton, 1913; Brosset, 1962; Khajuria, 1980) and one roost in southern part of Gujarat (Chakraborty and Agrawal, 2000) this species has not been recorded from the north-western parts of Gujarat representing western part of the Indian Thar Desert.

Methodology:

In the month of July 2006, based on the information from locals an opportunistic survey was undertaken at the Fort of Sandhan village (N 23.022° & E 68.992°), located in Abdasa taluka of Kachchh district in Gujarat, India (Fig. 2), to assess the status of bats roosting therein. The site was investigated to know the composition and population estimates of bat species. Identification was based on morphological observations and comparison of morphometric measurements with that provided in Bates and Harrison (1997). Direct roost count method (Thomas *et al.*, 1979) for *R. lepidus* and surface area estimate (Dwyer, 1966) were used for population census of *Rhinopoma hardwickii* and *Tapozous perforatus*.

Results and discussion:

A total of three species were observed in the fort premise of Sandhan village (Fig. 3. see web supplement). Of these, Blyth's Horseshoe bat

Table 1: Morphometric measurements (in mm.) of *Rhinolophus lepidus* sampled from Fort of Sandhan village in Kachchh district of Gujarat.

Name of the body part	Male (n=1)	Female (n=2)	
		n ₁	n ₂
HB (Head and Body length)	46	44	45
HF (Hind foot)	7	7	7
T (Tail)	22	21	21
FA (Forearm)	40	40	40
E (Ear)	18	17	17
WSP (Wing span)	249	245	247
TbL (Tibial length)	17	16	17

Rhinolophus lepidus were found roosting in a semi-dark ruined closed room of the fort. This was a colony consisting of 17 individuals (Fig. 4. see web supplement) roosting on the ceiling with maintaining a distance of 2-3 cm between each other. By sensing our presence they took flight and a few individuals (3 individuals) were successfully captured with hoop net for identification. Each of them was handled carefully and processed for morphological measurements

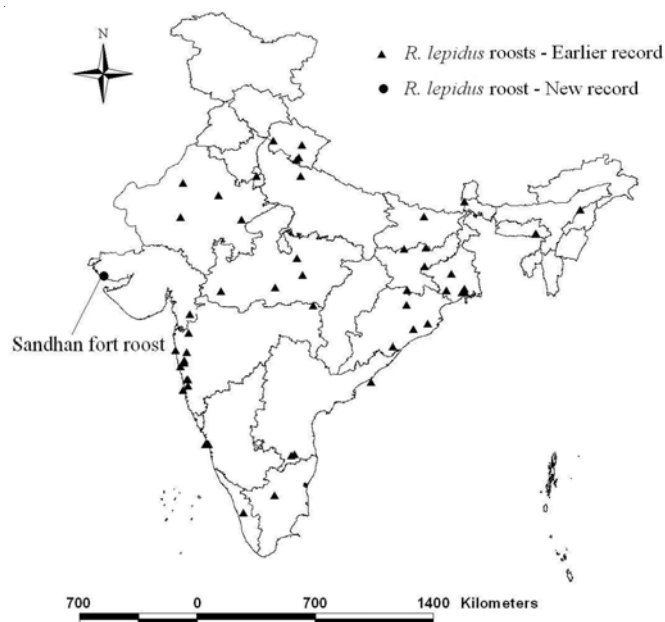


Fig. 1: Distribution of Blyth's Horse-shoe bat, *Rhinolophus lepidus* in India.

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(Table 1). The tip of the triangular shaped connecting process of characteristic noseleaf was broadly rounded off. Anterior surface of scella was less conspicuously emarginated and significantly longer. The lancet was well developed and had pointed tip.

We continued our search in other areas of the fort and could find roosts of two more microchiropteran species namely, the Lesser Mouse-tailed bat, *Rhinopoma hardwickii* and the Egyptian Tomb bat, *Taphozous perforatus* co-existing (estimated population of 250 – 300 individuals) in another dilapidated semi-dark compartment of the fort (Fig. 5). Both these species are commonly found in the Thar Desert and were identified visually based on their morphology (Author has gained proficiency in identification of these species through eight years of field experience of working on bats of the Thar Desert in Rajasthan). The roosting site of the Horseshoe Bats was located 50 m from that of the other two species.

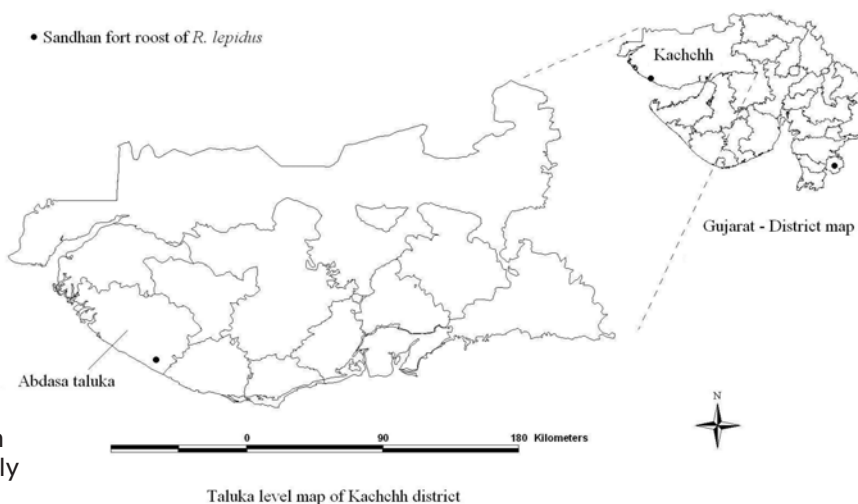
Though *R. lepidus* has been reported earlier from Jodhpur and Bikaner districts of Rajasthan in the Thar desert (Prakash, 1963; Senacha, 2003) and Ahwa in The Dangs district of southern Gujarat (Chakraborty and Agrawal, 2000), finding it from Sandhan fort is the first record of this species in north-western parts of Gujarat that represent western part of the Indian Thar Desert. Moreover Sandhan Fort roost is located 546 kilometers further west to its reported roosts in Jodhpur of Rajasthan and 510 kilometres north-west to the roost in Ahwa of southern Gujarat, the extreme most localities reported earlier for this species in western India. This report therefore adds to the range extension of this species in north-west parts of Gujarat and further west to the Thar Desert spread in India and Pakistan and over all to the distribution range of this species in western India.

However, *R. hardwickii* and *T. perforatus* have been reported earlier from Bhuj taluka (Bates and Harrison, 1997). Senacha (2003) reported co-existence of these three microchiropterans in a single roost. Segregation of *R. lepidus* from *R. hardwickii* and *T. perforatus* with in the same premise here is peculiar.

Acknowledgement:

I extend my sincere thank to my colleague Mr. Anant Khot of the Bombay Natural History Society, Mumbai for his assistance in field work and Mr. Kamlesh Mourya and his field assistant from Wildlife Institute of India, Dehradun for their cooperation and local guidance. I am also grateful to Dr. Asad Rahmani, Director, BNHS, for his academic support to pursue this work and The Rufford Small Grants Foundation, UK for financial support to work on conservation of bats in the Thar Desert of Rajasthan, India.

Fig. 2: Location of newly reported Sandhan Fort roost of *Rhinolophus lepidus* in Kachchh of Gujarat.



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Photographs by: Dr. K. R. Senacha

Fig. 3: Entrance view of Sandhan fort located at Sandhan village in Abdasa taluka of Kachchh in Gujarat.



Photographs by: Dr. K. R. Senacha

Fig. 4: A view of *Rhinolophus lepidus* colony observed recently at fort of Sandhan village in Abdasa taluka of Kachchh in Gujarat.



Photographs by: Dr. K. R. Senacha

Fig. 5: A colony of Lesser Mouse-tailed bat, *Rhinopoma hardwickii* and Egyptian Tomb bat, *Taphozous perforatus* colony observed recently at fort of Sandhan village in Abdasa taluka of Kachchh in Gujarat.



CHECKLIST OF BATS OF INDIA

and how it is different from Nameer 2000

(revised and updated as on June 2008--114 species in 8 families (Simmons 05)
Compiled by P. O. Nameer

Indian Bats 2008

This list has been compiled from Nancy Simmons (2005). [Order Chiroptera. Vol 1: 312-529, in: Mammal Species of the World, Third Edition (D. E. Wilson and D. M. Reeder, eds.)], Johns Hopkins University Press, Baltimore, MD. 2 Volumes, 2141 pp.

Present or current list which is published here, consists of 114 species in 8 families and 8 subfamilies, as against 112 species in Nameer, 2000.

Also ten species that were not in Nameer (2000) have been included (Table 1) in the current list, while seven that were in Nameer (2000) have not found a place in the current list (Table 2). This is primarily owing to the taxonomic changes as well as the updated information on the distribution of the species.

One of the major differences between the earlier list and the present list is that there are no sub-orders, now under the Order Chiroptera. Formerly the Order Chiroptera was subdivided into Megachiroptera and Microchiroptera. This change is based on relatively recent molecular studies.

Another difference is that the Hipposideridae has been elevated to the family status. Formerly it was a subfamily under the family Rhinolophidae

Further, eight species of bats are endemic to India (Table 3)

A few generic names of the Vespertilionids have been changed, e.g.

- *Pipistrellus affinis* is now called *Falsistrellus affinis*
- *Pipistrellus cadornae* is called *Hypsugo cadornae*
- *Pipistrellus circumdatus* is called *Arielulus circumdatus*
- *Pipistrellus dormeri* is called *Scotozous dormeri*
- *Pipistrellus savii* is called *Hypsugo savii*

Table 1 Bat species added to the Indian checklist since Nameer (2000)

1. *Rousettus aegyptiacus* (E. Geoffroy, 1810) Egyptian Rousette
2. *Rhinolophus shortridgei* K. Andersen, 1918 Shortridge's Horseshoe Bat
3. *Rhinolophus sinicus* K. Andersen, 1905. Chinese Horseshoe Bat
4. *Hipposideros durgadasi* Khajuria, 1970 Durga Das's Leaf-nosed Bat
5. *Eptesicus gobiensis* Bobrinskii, 1926 Gobi Big Brown Bat
6. *Pipistrellus abramus* (Temminck, 1838) Japanese Pipistrelle
7. *Tylonycteris robustula* Thomas, 1915 Greater Bamboo Bat
8. *Miniopterus magnater* Sanborn, 1931 Western Long-fingered Bat
9. *Harpiocephalus mordax* Thomas, 1923 Greater Hairy-winged Bat
10. *Kerivoula lenis* Thomas, 1916 Lenis Woolly Bat

Table 2 Bat species included in Nameer (2000), but not present in Nameer (2008)

1. *Hipposideros schistaceus* K. Andersen, 1918 Bellary Leaf-nosed Bat
2. *Eptesicus nilssoni* (Keyserling and Blasius, 1839) Bobinskii's Serotine
3. *Myotis daubentoni* (Kuhl, 1817) Daubenton's Bat
4. *Myotis mystacinus* (Kuhl, 1817) Whiskered Bat
5. *Plecotus austriacus* (J.Fischer, 1829) Grey Long-eared Bat
6. *Vespertilio murinus* Linnaeus, 1758) Particoloured Bat
7. *Kerivoula papillosa* (Temminck, 1840) Papillose Bat

Table 3 List of endemic bats of India

1. *Latidens salimalii* Thonglongya, 1972 Salim Ali's Fruit Bat
2. *Pteropus faunulus* Miller, 1902 Nicobar Flying Fox
3. *Rhinolophus cognatus* K. Andersen, 1906 Andaman Horseshoe Bat
4. *Rhinolophus mitratus* Blyth, 1844 Mitred Horseshoe Bat
5. *Hipposideros durgadasi* Khajuria, 1970 Durga Das's Leaf-nosed Bat
6. *Hipposideros hypophyllus* Kock and Bhat, 1994 Leafletted Leaf-nosed Bat
7. *Eptesicus tatei* Ellerman and Morrison-Scott, 1951 Sombre Bat
8. *Murina grisea* Peters, 1872 Peters's Tube-nosed Bat

CHECKLIST OF BATS OF INDIA

(revised and updated as on June 2008--114 species in 8 families (Simmons 05)

Compiled by P. O. Nameer

Legend:

AU - Australia, BA - Bangladesh, BH - Bhutan, EN - Endemic, ET - Ethiopian, EX - Extinct, I - India, M - Myanmar, N - Nepal, NE - Nearctic, P - Palearctic, PK - Pakistan, SE - South East Asia, SR - Sri Lanka

I. ORDER: CHIROPTERA

1) Family: Pteropodidae (Old-world fruit bats)

Subfamily: Pteropodinae (Fruit bats)

1. *Cynopterus brachyotis* (Müller, 1838) Lesser Short-nosed Fruit Bat - I, M, N, SE, SR
2. *Cynopterus sphinx* (Vahl, 1797) Greater Short-nosed Fruit Bat - BA, I, M, P, PK, SE, SR
3. *Eonycteris spelaea* (Dobson, 1871) Lesser Dawn Bat - I, M, N, P, SE
4. *Latidens salimalii* Thonglongya, 1972 Salim Ali's Fruit Bat - I (EN)
5. *Macroglossus sobrinus* K. Andersen, 1911 Greater Long-tounged Fruit Bat - I, M, SE
6. *Megaerops niphanae* Yenbutra and Felten, 1983 Ratanaworabhan's Fruit Bat - I, SE
7. *Pteropus faunulus* Miller, 1902 Nicobar Flying Fox - I (EN)
8. *Pteropus giganteus* (Brünnich, 1782) Indian Flying Fox - BA, I, M, N, P, PK, SR
9. *Pteropus hypomelanus* Temminck, 1853 Variable Flying Fox - I, M?, SE
10. *Pteropus melanotus* Blyth, 1863 Black-eared Flying Fox - I, SE
11. *Rousettus aegyptiacus* (E. Geoffroy, 1810) Egyptian Rousette - I, ET, P, PK
12. *Rousettus leschenaultii* (Desmarest, 1820) Leschenault's Rousette - I, M, P, PK, SE, SR
13. *Sphaerias blanfordi* (Thomas, 1891) Blanford's Fruit Bat - BH, I, M, P, SE

2) Family: Rhinolophidae (Horseshoe bats)

14. *Rhinolophus affinis* Horsfield, 1823 Intermediate Horseshoe Bat - AU, I, M, N, P, SE
15. *Rhinolophus beddomei* Andersen, 1905 Beddomme's Horseshoe Bat - I, SR
16. *Rhinolophus cognatus* K. Andersen, 1906 Andaman Horseshoe Bat - I (EN)
17. *Rhinolophus ferrumequinum* (Schreber, 1774) Greater Horseshoe Bat - AF, I, P, N, PK
18. *Rhinolophus hipposideros* (Bechstein, 1800) Lesser Horseshoe Bat - ET, I, P
19. *Rhinolophus lepidus* Blyth, 1844 Blyth's Horseshoe Bat - AF, I, N, M, P, PK, SE
20. *Rhinolophus luctus* Temminck, 1835 Woolly Horseshoe Bat - I, M, N, P, SE, SR
21. *Rhinolophus macrotis* Blyth, 1844 Big-eared Horseshoe Bat - I, M, N, P, PK, SE
22. *Rhinolophus mitratus* Blyth, 1844 Mitred Horseshoe Bat - I (EN)
23. *Rhinolophus pearsonii* Horsfield, 1851 Pearson's Horseshoe Bat - BH, I, M, N, P, SE
24. *Rhinolophus pusillus* Temminck, 1834 Least Horseshoe Bat - I, M, N, P, SE
25. *Rhinolophus rouxii* Temminck, 1835 Rufous Horseshoe Bat - I, M, N, SE?, SR
26. *Rhinolophus shortridgei* K. Andersen, 1918 Shortridge's Horseshoe Bat - I, M
27. *Rhinolophus sinicus* K. Andersen, 1905 Chinese Horseshoe Bat - I, N, P, SE
28. *Rhinolophus subbadius* Blyth, 1844 Little Nepalese Horseshoe Bat - I, M, N, SE
29. *Rhinolophus trifolius* Temminck, 1834 Trefoil Horseshoe Bat - I, M, SE
30. *Rhinolophus yunnanensis* Dobson, 1872 Asian Horseshoe Bat - I, M, P, SE

3) Family: Hipposideridae (Old-World Leaf-nosed bats, Trident bats)

31. *Coelops frithi* Blyth, 1848 East Asian Tailless Leaf-nosed Bat - BA, I, M, P, SE
32. *Hipposideros armiger* (Hodgson, 1835) Great Leaf-nosed Bat - I, M, N, P, SE
33. *Hipposideros ater* Templeton, 1848 Dusky Leaf-nosed Bat - AU, I, M, SE, SR
34. *Hipposideros cineraceus* Blyth, 1853 Ashy Leaf-nosed Bat - I, M, PK, SE
35. *Hipposideros diadema* (E. Geoffroy, 1813) Diadem Leaf-nosed Bat - AU, I, M, SE
36. *Hipposideros durgadasi* Khajuria, 1970 Durga Das's Leaf-nosed Bat - I (EN)
37. *Hipposideros fulvus* Gray, 1838 Fulvus Leaf-nosed Bat - AF, I, PK, SE, SR
38. *Hipposideros galeritus* Cantor, 1846 Cantor's Leaf-nosed Bat - AU, I, M, SE, SR
39. *Hipposideros hypophyllus* Kock and Bhat, 1994 Leafletted Leaf-nosed Bat - I (EN)
40. *Hipposideros lankadiva* Kelaart, 1850 Kelaart's Leaf-nosed Bat - I, SR
41. *Hipposideros larvatus* (Horsfield, 1823) Intermediate Leaf-nosed Bat - BA, I, M, P, SE
42. *Hipposideros pomona* K. Andersen, 1918 Pomona Leaf-nosed Bat - BA, I, M, P, SE
43. *Hipposideros speoris* (Schneider, 1800) Schneider's Leaf-nosed Bat - I, SR



4) Family: Megadermatidae (False-vampire bats)

44. *Megaderma lyra* E. Geoffroy, 1810 Greater False Vampire Bat - AF, BA, I, M, P, PK, SE, SR
45. *Megaderma spasma* (Linnaeus, 1758) Lesser False Vampire Bat - I, M, SE, SR

5) Family: Rhinopomatidae (Mouse-tailed bats)

46. *Rhinopoma hardwickii* Gray, 1831 Lesser Mouse-tailed Bat - ET, I, M, P, PK
47. *Rhinopoma microphyllum* (Brünnich, 1782) Greater Mouse-tailed Bat - AF, ET, I, M, P, PK, SE
48. *Rhinopoma muscatellum* Thomas, 1903 Small Mouse-tailed Bat - AF, I, P, PK

6) Family: Emballonuridae (Sheath-tailed bats)

Subfamily: Taphozoinae (Tomb bats)

49. *Saccolaimus saccolaimus* (Temminck, 1838) Naked-rumped Pouched Bat - AU, BA, I, M, SE, SR
50. *Taphozous longimanus* Hardwicke, 1825 Long-winged Tomb Bat - BA, I, M, SE, SR
51. *Taphozous melanopogon* Temminck, 1841 Black-bearded Tomb Bat - I, M, P, SE, SR
52. *Taphozous nudiventris* Cretzschmar, 1830 Naked-rumped Tomb Bat - AF?, ET, I, M, P, PK
53. *Taphozous perforatus* E. Geoffroy, 1818 Egyptian Tomb Bat - I, ET, P, PK
54. *Taphozous theobaldi* Dobson, 1872 Theobald's Tomb Bat - AU, BA?, I, M, SE

7) Family: Molossidae (Free-tailed bats)

Subfamily: Molossinae

55. *Chaerephon plicatus* (Buchanan, 1800) Wrinkle-lipped Free-tailed Bat - I, M, P, SE, SR
56. *Otomops wroughtoni* (Thomas, 1913) Wroughton's Giant Mastiff Bat - I, SE
57. *Tadarida aegyptiaca* (E. Geoffroy, 1818) Egyptian Free-tailed Bat - AF, I, ET, P, PK, SR
58. *Tadarida teniotis* (Refinesque, 1814) European Free-tailed Bat - AF, ET, I, P, PK, SE

8) Family: Vespertilionidae (Vesper bats)

Subfamily: Vespertilioninae

Tribe: Eptesicini

59. *Arielulus circumdatus* (Temminck, 1840) Bronze Sprite- I, M, N, P, SE
60. *Eptesicus gobiensis* Bobrinskii, 1926 Gobi Big Brown Bat- AF, I, P, PK, N
61. *Eptesicus pachyotis* (Dobson, 1871) Thick-eared Bat - BA, I, M, P, SE
62. *Eptesicus serotinus* (Schreber, 1774) Common Serotine - ET, I, P, PK, SE
63. *Eptesicus tatei* Ellerman and Morrison-Scott, 1951 Sombre Bat - I (EN)
64. *Hesperoptenus tickelli* (Blyth, 1851) Tickell's Bat - BH, I, M, N, P, SE, SR

Tribe: Nycticeiini

65. *Scotoecus pallidus* (Dobson, 1876) Desert Yellow Lesser House Bat - I, PK
66. *Scotomanes ornates* (Blyth, 1851) Harlequin Bat - I, M, P, SE
67. *Scotophilus heathii* (Horsfield, 1831) Greater Asiatic Yellow House Bat - AF, I, M, P, PK, SE, SR
68. *Scotophilus kuhlii* Leach, 1821 Lesser Asiatic Yellow Bat - BA, I, M, P, PK, SE, SR

Tribe: Pipistrellini

69. *Nyctalus leisleri* (Kuhl, 1817) Leisler's Noctule - AF, ET, I, P, PK
70. *Nyctalus montanus* (Barrett-Hamilton, 1906) Mountain Noctule - AF, I, N, PK
71. *Nyctalus noctula* (Schreber, 1774) Noctule - I, M, P, PK, SE
72. *Pipistrellus abramus* (Temminck, 1838) Japanese Pipistrelle - I, M, P, SE
73. *Pipistrellus ceylonicus* (Kelaart, 1852) Kelaart's Pipistrelle - BA, I, M, P, PK, SE, SR
74. *Pipistrellus coromandra* (Gray, 1838) Indian Pipistrelle - AF, BA, BH, M, N, P, PK, SE, SR
75. *Pipistrellus javanicus* (Gray, 1838) Javan Pipistrelle - AF, AU, I, M, P, PK, SE
76. *Pipistrellus kuhlii* (Kuhl, 1817) Kuhl's Pipistrelle - ET?, I, P, PK
77. *Pipistrellus paterculus* Thomas, 1915 Mount Popa Pipistrelle - I, M, P, SE
78. *Pipistrellus pipistrellus* (Schreber, 1774) Common Pipistrelle - AF, ET, I, M, P, PK
79. *Pipistrellus tenuis* (Temminck, 1840)) Least Pipistrelle - AF, I, M?, P, PK, SE, SR?
80. *Scotozous dormeri* Dobson, 1875 Dormer's Pipistrelle - I, PK

Tribe: Plecotini

81. *Barbastella leucomelas* (Cretzschmar, 1826) Eastern Barbastelle - AF, ET, I, N, P, PK
82. *Otonycteris hemprichii* Peters, 1859 Hemprich's Desert Bat - AF, ET, I, P
83. *Plecotus auritus* (Linnaeus, 1758) Brown Long-eared Bat - I, N, P

Tribe: Vespertilionini

- 84. *Falsistrellus affinis* (Dobson, 1871) Chocolate Pipistrelle - I, M, N, P, SR
- 85. *Hypsugo cadornae* (Thomas, 1916) Cadorna's Pipistrelle - I, M, SE
- 86. *Hypsugo savii* (Bonaparte, 1837) Savi's Pipistrelle - AF, ET, I, M, P, PK
- 87. *Ia io* Thomas, 1902 Great Evening Bat - I, P, N, SE
- 88. *Tylonycteris pachypus* (Temminck, 1840) Lesser Bamboo Bat - BA, I, M, P, SE
- 89. *Tylonycteris robustula* Thomas, 1915 Greater Bamboo Bat - I, M, P, SE

Sub family: Myotinae

- 90. *Myotis annectans* (Dobson, 1871) Hairy-faced Myotis - I, M, SE
- 91. *Myotis blythii* (Tomes, 1857) Lesser Mouse-eared Myotis - ET, I, P
- 92. *Myotis formosus* (Hodgson, 1835) Hodgson's Myotis - AF, I, N, P, SE
- 93. *Myotis hasseltii* (Temminck, 1840) Lesser Large-footed Myotis - I, M, SE, SR
- 94. *Myotis horsfieldii* (Temminck, 1840) Horsfield's Myotis - I, M, P, SE
- 95. *Myotis laniger* Peters, 1871 Chinese Water Myotis - I, P, SE
- 96. *Myotis longipes* (Dobson, 1873) Kashmir Cave Myotis - I, SE
- 97. *Myotis montivagus* (Dobson, 1874) Burmese Whiskered Myotis - I, M, P, SE
- 98. *Myotis muricola* (Gray, 1846) Nepalese Whiskered Myotis - AF, I, M?, N, P?, PK, SE
- 99. *Myotis sicarius* Thomas, 1915 Mandelli's Mouse-eared Myotis - I, N
- 100. *Myotis siligorensis* (Horsfield, 1855) Himalayan Whiskered Myotis - I, M, P, SE

Subfamily: Miniopterinae (Long-fingered bats, Bent-winged bat)

- 101. *Miniopterus magnater* Sanborn, 1931 Western Long-fingered Bat - AU, I, M, SE
- 102. *Miniopterus pusillus* Dobson, 1876 Small Long-fingered Bat - I, M, N, SE
- 103. *Miniopterus schreibersii* (Kuhl, 1817) Schreibers's Long-fingered Bat - AF, AU, BA, ET, I, M, N, P, PK, SE, SR

Subfamily: Murininae (Tube-nosed bats)

- 104. *Harpiocephalus harpia* (Temminck, 1840) Lesser Hairy-winged Bat - I, P, SE
- 105. *Harpiocephalus mordax* Thomas, 1923 Greater Hairy-winged Bat - I?, M, SE
- 106. *Murina aurata* Milne-Edwards, 1872 Little Tube-nosed Bat - I, M, N, P, SE
- 107. *Murina cyclotis* Dobson, 1872 Round-eared Tube-nosed Bat - I, M, SE, SR
- 108. *Murina grisea* Peters, 1872 Peters's Tube-nosed Bat - I (EN)
- 109. *Murina huttoni* (Peters, 1872) Hutton's Tube-nosed Bat - I, P, SE
- 110. *Murina leucogaster* Milne-Edwards, 1872 Greater Tube-nosed Bat - I, N, P, SE
- 111. *Murina tubinaris* (Scully, 1881) Scully's Tube-nosed Bat - I, M, PK, SE

Subfamily: Kerivoulinae (Woolly bats)

- 112. *Kerivoula hardwickii* (Horsfield, 1824) Hardwicke's Woolly Bat - I, M, N, P, SE, SR
- 113. *Kerivoula lenis* Thomas, 1916 Lenis Woolly Bat - I, SE
- 114. *Kerivoula picta* (Pallas, 1767) Painted Woolly Bat - I, M, N, P, SE, SR



About frugivorous bats of northern Western Ghats

Korad V.S and M.C. Gaikwad

While surveying the bat fauna in the part of northern Western Ghats (funded by Ministry of Environment and forests), the following observations pertaining to frugivorous bats are reported.

The survey of bat fauna in the northern Western Ghats (19° 17'N & 73° 11'E, extending from Bhimashankar in the North to Mahabaleshwar in the South) has reported 30 bat species, of which only 3 genera and 3 species belonging to suborder Megachiroptera are frugivorous in habit. These are Fulvus Fruit Bat *Rousettus leschenaultii*, Indian Flying Fox *Pteropus giganteus* and Short-nosed Fruit Bat *Cynopterus sphinx*.

Fulvus fruit bat *Rousettus leschenaultii*

This species is reported from only 6 distinctly located colonies in the area of about 13,000km². This bat species is confined to hilly region in evergreen, semi evergreen and deciduous forests. It prefers terrain or sub terrain natural caves and dam tunnels as day roosts. This species prefers high relative humidity in their micro habitat, which in most of the cases is maintained by a freshwater tank or permanent stream or water tunnel running over the floor of the roosting site.

Of the 6 colonies three colonies have more than 10,000 bats each. The bats occupy high corners of their roost and form a compact cluster. They are found busy changing their positions in the cluster. Usually the colony includes both adults and sub adults.

The fulvus fruit bats emerge late in the evening almost after complete development of dark and leave the roosting site in groups of a few bats. They disperse randomly to forage in the nearby forest. Females with a single pup each are reported in summer as well as in post monsoon seasons. During this time they isolate from males and segregate from their mother colony. Such colonies are temporary, obviously small in size and not far away from the mother colony.

Rousettus leschenaultii also seems to share its roosting sites with other bat species (such as *Miniopterus schreibersii*, *Rhinolophus rouxii*, *Rhinolophus lepidus*) and other fauna (such as rock pigeon and aquatic freshwater fauna particularly fishes and amphibians). When disturbed from day roost, the bats of this species are easily preyed by kites and eagles.

The rate of degradation of forest in the Northern Western Ghats is astonishingly high due to anthropogenic activities in the forest area. This bat species therefore is restricted to the forest pockets, which are inaccessible to human beings. Once disturbed, this bat species seems to leave the habitat and does not return.

Requirement of forest plant species in the foraging ground, natural caves or man made constructions (like dam tunnels and tanks on forts) with high relative humidity have compelled this species to aggregate in large number, where conditions are favourable.

Indian flying fox *Pteropus giganteus*

This species is the most widely distributed in the northern Western Ghats. The richness of the foraging ground reflects on the colony size. This bat species prefers forests of hilly region of the Ghats as their foraging ground, but it roosts in the low spurs extending for some kilometers eastwards from the hilly region of Western Ghats. The colonies of this species are specifically located amidst human population. These bats require tall trees (of indigenous or exotic plant species) in the vicinity of canals or rivers for day roosting.

The colony of Indian flying fox comprises both adults and sub adults. Mothers with a single pup each are reported in the months of early summer. These bats emerge 20-25 minutes after sunset. They either make whirls around the trees or emerge directly. They disperse randomly in all directions, but their movements become quite directional in summer towards nearby water bodies and forest.

Unlike Fulvus fruit bat (*Rousettus leschenaultii*), the Indian flying fox seems to be adapted to the dry and hot climate. The colonies of this bat species is widely distributed throughout northern Western Ghats and periphery. About 15 colonies are reported from the low hills of Ghats region, each with population size ranging between 500+ and 2,000+. The number of colonies of this species is highest in the spurs region of Ghats; about 25 colonies are reported with density of population ranging from 50+ to 4,000+ each. The colonies on the dry eastern part of the Ghats have colonies with less than 50 bats to 200 bats each. The colony size in this dry area depends on availability of food plants in the foraging ground.

In spite of illegal poaching of flying foxes for flesh and medicinal purpose, the colony size of this species in northern Western Ghats region is found to be fairly constant for years together. Falling of trees, particularly of *Ficus* species under road widening projects has adverse effect on population of this species.

Short nosed fruit bat *Cynopterus sphinx*

This small sized fruit bat species is found roosting in inflorescence of fish tail palm, in the dense foliage of Ashoka tree (*Polyalthia longifolia*) and tree holes of

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indigenous plants like mango trees. But more often this bat species is found in the corners and eaves of old buildings in rural and urban areas. This species is not common from the hilly region of Western Ghats. The colonies are more frequent in spurs of Northern Western Ghats. The well flourished colony appears as harem of a single male bat with females and pups comprising population of about 20-25 bats.

The short nosed fruit bat prefers medium sized plants for foraging. Such plants are plenty in the urban and semi urban areas of northern Western Ghats. Occurrence of this species in early evening and around mid night in the gardens around residential area is quite common. All species of *Ficus* plants, Ashoka tree (*Polyalthia longifolia*), golden bahava (*Cassia fistula*), Singapore cherry are some of the unmistakable food plants for this species in the urban and semi urban areas. This bat species is reported occasionally from orchards of guava, sapota and berry fruits in the rural area.

Like flying foxes the short nosed fruit bats are well adapted to hot and dry climatic conditions. Availability of medium sized food plants seems to be the limiting factor for distribution of this bat species. If conditions for roosting remain unaltered, this species of fruit bat prefers the same roost for many years. This bat species is preyed by kites, sparrow hawks and common crows.

Thus the northern Western Ghats being dry and hot has only three genera and 3 species of frugivorous

bats, which comprise only 10% of total bat species diversity of this region. The size of the colonies is remarkable in the forest area, which has remarkable sustainability for frugivorous bats. But each of the megachiropteran bat species in the northern Western Ghats has its own peculiarity for preference of roosting sites. The fulvus fruit bat is naturally a cave species, but they are found to be comfortable in the dam tunnels and tanks on the forts. In spite of a large number of forts in the study area, occurrence of colonies of this species is rare. This species seems to be sensitive towards natural or anthropogenic disturbance. This species completely depends on forest plants for feeding. The Fulvus fruit bat is categorized as Least concern (LC) following the conservation status of IUCN (2001) and C.A.M.P. Workshop (2002), but the present survey in the northern Western Ghats region highlights its rare occurrence in this region.

High rate of deforestation, increase in dryness and atmospheric temperature and increased rate of anthropogenic activities in the forest area of the northern Western Ghats are some of the universal problems faced by the bat fauna. Conservation of forest flora and fauna through education seems to be the only means of conservation. For educating the forest community and school community in this region of Western Ghats needs proper planning and serious efforts from government as well as from non-government organizations.

Project PteroCount Progress (www.ptercount.org)

Sanjay Molur*

Project PteroCount is moving right along ! Brainchild of Dr. Sharoukh Mistry who also had the brainstorm of asking CCINSA to run it, Pterocount got its start in January 2005. First agenda item was to start a website where Pterocount volunteers could monitor its progress, see project details, amount of volunteer enrollment, population estimation methodology, downloadable data sheets in PDF and Word formats — all found on www.pterocount.org.

From two fellows, Sharoukh and myself, Pterocount has increased to 78 people having registered and 20 providing consistent roost information. Over 100 roosts have been reported till now from three countries in South Asia, Bangladesh - 13; India - 86; and Nepal - 4. Roost information is now available in India for 10 states, all thanks to Pterocount volunteers. The output per Indian state follows below, also going by the order of roost identified and monitored by volunteers : Andhra Pradesh - 2; Assam - 11; Gujarat - 2; Himachal Pradesh - 1; Karnataka - 39; Kerala - 8; Madhya Pradesh - 1; Maharashtra - 2; Rajasthan - 8; Tamil Nadu - 7. Apart from this several other roosts have been entered into the database based on publications.

Project PteroCount is maintaining the data supplied by volunteers and extracted from publications with all sources of information or contribution fully credited. Soon the website will take on a new form to accommodate more information and provide a map of roost sites as available until now. All roosts with GPS information are being mapped on Google Earth Plus. In some localities roosts have been destroyed as a result of road construction and expansion which we will come back to and try to prevent in future. We are making the web site www.pterocount.org interactive so that volunteers can service their own roost information directly. While we try and improve our data management and compilation, we are hoping for a more enthusiastic participation and more volunteers, particularly those who enrolled eagerly when the project was initiated. Roost information has been compiled in different degrees of completeness and needs greater attention from some volunteers. This is an enormous task and an important one ... we invite you to provide information for documenting roost sites and population trends so that we can do a better job of protecting bats.

*** Deputy Director, Zoo Outreach Organisation**

A survey on the roosting sites of Indian Flying Fox *Pteropus giganteus* Brünnich, 1782. in and around Coimbatore and Palakkad districts, India

Joseph Reginald L.¹, P. Mohan Prasath², C. Mahendran³, Aravind Venkatesan⁴, K. Prabhu⁵, B. Ravichandran and Sanjay Molur⁶

A general reconnaissance survey was conducted between October 2005 and December 2006 to document the roosting sites of *Pteropus giganteus*, as part of Project PteroCount (a project entirely based on volunteers and is the first such network to monitor the population of this species in South Asia). In the Indian subcontinent, five species of *Pteropus* are known to occur with an endemic species *Pteropus faunulus* on Nicobar Islands and the rest are *Pteropus giganteus*, *Pteropus vampyrus*, *Pteropus hypomelanus* and *Pteropus melanotus*. They are an essential part in the ecosystem and the known roles being pollination and seed dispersal.

A total of 14 roosting locations of *Pteropus giganteus* were identified in and around Coimbatore and Palakkad districts (Table-I). Of the 14 roosts, five are from home garden, two each from temple, roadside and plantation and one each from an urban park, agricultural field and factory campus. Bat populations of three of the five roosting places in the home gardens have their shifted roosting place in the last five years (Table - II). The other two colonies which were monitored for a year indicate high population fluctuation between two thousand and five. The threats include netting, shooting for meat and cutting down of roost trees. The populations in the temples and park are conserved by religious beliefs and law respectively and even the local communities take part in the conservation of this species in few roosts by releasing the beneficial role. But the

knowledge about the populations in other private lands is not known.

Though these 14 roosting places are a very small sample size to make any general conclusion, it suggests a trend. The overall populations of this species are conserved either by religious belief or law survives and very few communities act to save this species. The populations in the private places are in danger. This necessitates a survey of such populations, which are outside the protected places and some special attempt to save this species is required. The most important is to scientifically assess (between bat researchers and agricultural officials) the damage caused by this species to fruit crops and alternatives should be developed. The vermin state of this species in the Schedule V of the Indian Wildlife (Protection) 1972 should be reassessed.

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Table - II. Details of Local population shift

S.No	Location of the Roost	GPS Reading	Place of Roost	No. of Roost Trees	Roost Tree Species	Approximate Roost Size	Reason Population Shift
1	Tamil Nadu, Coimbatore, Kaniur, Thattampudhur	11°06'03.9" N 77°09'23.3" E	Home garden	2	<i>Ailanthus excelsa</i> and <i>Albizia lebbbeck</i>	2000	Considered bats as a nuisance and hence the tree were cut down by local people
2	Tamil Nadu, Coimbatore, Kaniur, Thanneerpanthal	11°06'51.2" N 77°09'58.5" E	Home garden	1	<i>Ficus</i> Sp	2000	Tree felling
3	Tamil Nadu, Coimbatore, Kaniur, Kolathotam	11°04'55.7" N 77°08'10.3" E	Roadside	-	-	-	Tree felling
4	Tamil Nadu, Salem, Mettur, Singiripatti village, Vavvaal thoppu, Naallukavala thotam	11°51'50.9" N 77°45'03.4" E	Home garden	1	<i>Azadirachta indica</i>	500	The tree branches got broken during rain

Table - I. Detailed account on the roosting sites of Indian Flying Fox *Pteropus giganteus* Brünnich, 1782 in and around Coimbatore and Palakkad districts, India

S.No	Location of the Roost	GPS Reading	Place of Roost	Number of Roost Trees	Roost Tree Species	Method Used to Count Bats	Roost Size	Protection Information
1	Tamil Nadu, Coimbatore, V.O.C Park Zoo	11°0'27.03" N 76°58'14.48" E	Public park	25	<i>Ficus religiosa</i> , <i>Tamarindus indica</i> , <i>Albizia lebbbeck</i> , <i>Delonix regia</i> , <i>Polyalthia longifolia</i> , <i>Acacia</i> sp, <i>Azadirachta indica</i> , <i>Samanea saman</i>	Tree estimation	2000+ (06.12.06)	Protected by Law
2	Tamil Nadu, Coimbatore, Avinashi, Savakatu Palayam	11°18'59.0" N 77°17'16.8" E	Roadside	2	<i>Ficus religiosa</i> and <i>Ailanthus excelsa</i>	Exact count	600 (06.12.06) 380 (16.12.06)	Protected by local community
3	Tamil Nadu, Coimbatore, Mettupalayam, Jallymedu	11°18'548" N 76°55'123" E	Plantation	18	<i>Mango</i> sp	Branch estimation	1000 (08.09.06)	Not Known
4	Tamil Nadu, Coimbatore, Mettupalayam, Odanthurai	11°18'729" N 76°55'803" E	Plantation	1	<i>Ficus religiosa</i>	Branch estimation	50 (08.09.06)	Not Known
5	Tamil Nadu, Coimbatore, Mettupalayam, Sirumugai, VISCOSE Factory	11°19'560" N 77°00'519" E	Factory campus	10	<i>Eucalyptus</i> sp	Tree estimation	100 – 150 (08.09.06)	Not Known
6	Tamil Nadu, Salem, Mettur, Singiripatti village, Vavvaal thoppu	11°51'45.1" N 77°44'51.5" E	Agricultural field	1	<i>Ficus</i> sp	Exact count	350 (29.07.07)	Protected by religious belief
7	Tamil Nadu, Karur, Vellakoil, Kodanthur	10°55'28" N 77°47'43" E	Temple	9	<i>Tamarindus indica</i>	Exact count	360 (28.07.06)	Protected by religious belief
8	Kerala, Palakkad, Ellapuly para, Kunnukadu	10°44'34.5" N 76°44'22.0" E	Home garden	1	<i>Pterocarpus marsupium</i>	Exact count	# Max: 450 (02.10.05) Min: 0 (10.12.06)	Not Protected. Threats include Shooting, Netting
9	Kerala, Palakkad, Ellapuly para, Cherumkad	10°44'33.8" N 76°44'37.3" E	Home garden	1 - 12	<i>Albizia lebbbeck</i> , <i>Leucaena leucocephala</i> , <i>Tectona grandis</i> and <i>Bamboo</i> sp	Branch estimation	# Max: 2340 (10.12.06) Min: 0 (28.5.06)	Not Protected. Threats include Shooting, Netting and Cutting Down the Roost Trees
10	Kerala, Palakkad, Vadakencherry, Kelakeypalayam, Mariamman Temple	10°35'13.4" N 76°29'45.7" E	Temple	2	<i>Ficus religiosa</i> and <i>Tamarindus indica</i>	Exact count	# Max: 909 (13.12.05) Min: 330 (02.10.05)	Protected by religious belief

- Monthly population data was collected between October 2005 and December 2006

+ - An equal number bats also roosts in the nearby Coimbatore central prison campus and it was not surveyed

Giant Indian Fruit Bat *Pteropus giganteus* Brunnich Roost in Karnataka, South India: A Case for Preservation as a Heritage Site

A.K. Chakravarthy, H.M. Yeshwanth, L. Vijaya Kumar and N.R. Prasanna Kumar

Introduction

Many of the lesser-known taxa, such as bats, have received little protection and face considerable threats and higher probability of endangerment. India's bat fauna is rich and diverse. India has more than 11% of the world's bats including 13 fruit bats and 101 insect bats (Wilson and Reeder, 2005). These species provide substantial ecological and economic services via pollination, seed dispersal and agricultural pest control (Mistry, 2001). For example, the common species of fruit bats (*Cynopterus sphinx*, *Pteropus giganteus* and *Rousettus leschenaulti*) visit over 114 plant species and act as an important pollen and seed vectors (Micheleburgh *et al.*, 1992). Yet many bat species in India face numerous threats. They may cause economic loss while feeding on fruits (Varghese, 1998; Srinivasulu and Srinivasulu, 2001a). But this is negligible compared to their beneficial roles. In India meat and other parts of body of fruit bats are used to cure respiratory disorders, menstrual problems and as food (Molur & Daniel, 2000). Fruit bats are often referred to as messengers of god, Lord Shiva. Bats conserve rain forests too. For instance, *Latidens salimali* is the prime seed disperser in the rain forest, which help us a lot in the restoration of tall fruiting trees of Agasthiyarmalai range of southern Western Ghats (Vanitharani, 2005). In Bihar, bats viz., *Megaderma lyra* are known to keep under check destructive rodent species in cultivated crops, godowns and houses (Sinha, 2002).

Materials and Methods

An effort was made to estimate the number of bats at the roost. Two observers armed with binoculars (80x30 and 70x50) counted the number of bats clinging to branches of trees by going round the roosts, prior to evening flight. The two observers counted the bats independently and separately. The numbers were averaged. At 6.20 pm few bats were observed making foraging flights. Four observers placed in four directions counted the number of bats issuing out of the roosting trees. The counts of each observer were added to make the size of the roost. A proforma was developed to interact with the villagers in local language, kannada.

Roosting site

The roosting site is located in a village called Gidadapalya located 15 km north of Kunigal town. Tumakooru (13.3° N, 77.1° E) is a village with about 50% under vegetation cover. The village has 150 houses and farmers cultivate diversified crops like tomato, ragi arecanut, coconut, sapota and other vegetables. The village is surrounded by forest plantations of *Casurina*, *Acacia* and indigenous tree species like *Ficus*, *Bahunia*, *Samanea saman*, *Tamarindus indica* and other species. The roosting site

extends to about one acre (10,000 sq mtrs) and is covered with indigenous species of trees as mentioned above. The canopy cover is almost 100%. The ground cover is diverse and surrounded by thick *Lantana* bushes.

History

It is believed that the bats *Pteropus giganteus* have been residing in this village from the past 75 years. The present roosting site is the third place that the bats have changed since at the first place the trees were cut as it was a private property. The bats shifted to the second place. Even at this place the trees were cut. Later the bats shifted to the present place where there are 30 *Ficus bengalensis* (banyan) trees and bamboo clumps. The land and property of roost site belongs to Mr. Gangadhar where bats are roosting for the past 18-20 years. Mr. Gangadhar and villagers are very keen to see that the roost site be declared a heritage site.

It is believed that a rishi had advised Mr. Gangadhar's father to protect these bats. So this place is conserved / protected by villagers. The villagers are nature loving is evidenced by the maintenance of good vegetation cover (75%) in the village.

A small temple is at the center of roost site. Lantana plants were manually planted to protect intervention of cattle and people inside the roost site. So bats are left undisturbed. Lantana bushes act as buffer. There is a huge collection of leaf litter from banyan trees and bat guano at the site. It is collected in April – May after the rains and around 10 tractor loads (each load costs Rs. 1000/-) are collected per year and villagers use this manure for cultivating ragi, areca, coconut and other crops.

Observations

Feeding and foraging behaviour of bats was recorded on four dates during December 2007 to January 2008 using four wheeler drive vehicle, binoculars 80 x 30 and telescopes, when bat feeding on fruits, twigs and flowers in and around the roost (5 km²) were recorded. Opportunistic observations were also recorded on numbers, reproductive status and threats to the roost. A proforma was developed for interaction with villagers on the importance of bats and the roost site.

Results and Discussion

The breeding commenced in December in these bats. The young ones are born during February to April. The

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adult bats weighed up to 1 kg (n=6). Bats foraged on 3 to 4 species of *Ficus*, banyan tree, hippie (*Madhuka*), sapota (*Achras zapota*) and they feed on the young shoots and buds of these trees and fruits of *Ficus*. In general, the bats were observed leaving the roost for foraging by 6 pm. The bats were observed making recognizant flights around the trees and then dispersing in all directions for foraging. The young ones were left at roost and the mother bats foraged to nearer places in order to return to the roost early. The bats were observed drinking the water in near by ponds by surface diving. Thus the area around the roost provided shelter, food and breeding requirements for the fruit eating bats. Surveys for the roosts of *P. giganteus* during the last four years indicated a sharp decline in Bangalore Urban and Rural districts, Tumkooru, Chickmagalur, Shimoga and Hassan in southern Karnataka. In this context, roost size of 2,600 individuals and their breeding assumes significance.

Threats

Hunting of bats has been one of the great threats here, as elsewhere (Mickleburgh *et al.* 1992 and 2001). People come from far off places for hunting viz., Shimoga and Tumkooru. The prospective hunters, who hail from out side the village observe the flight paths, time, height and direction of fly ways. They erect large poles to hang the mist nets. The trapped bats are picked and sold Rs.200 per bat. However, if the hunters are noticed by the villagers, they are chased away and punished. The hunters also use guns for killing. Apart from serving as food the bats are used for medicinal purposes. Interaction with villagers revealed that on an average about 10% bats are killed at this roost.

Economic importance

Bats play a crucial role in the ecosystem. A very simplistic example being fruit bats work as pollinators and in seed dispersal and that of insectivorous bats in controlling much of the insect pests population. Although fruit bats damage a small percentage of agricultural crops, their role in forest regeneration more than compensates this loss in the long term from the perspective of the greater good. However, in the area bats were not observed implicating in any economic damage to any cultivated crops.

Folivorous bats consume flowers and fruits effecting seed dispersal and pollination. Some of the adaptations of bat pollinated syndrome include nocturnal anthesis, colour emission and presentation of rewards to the pollinators. We studied the bat pollinated plants such as *Parkia bidandulas*, *Bassia latifolia*, *Ciba pentendra* and *Kigelia pinnata*. Bats helped in cross pollination (Nathan *et al.*, 1991).

Public awareness on the importance of flying foxes in pollination, seed dispersal and the benefits of their excrement (as natural organic manures) may create better understanding to preserve their roosting habitats.

Over 200 species of flying foxes are distributed throughout the tropics and being frugivorous they play a major role in pollination and seed dispersal (Mistry, 2000). The Indian flying fox, *P. giganteus* commonly roosts on large trees (e.g. *Ficus*). They earned the name 'flying fox', as the head and fur resemble a fox. Their roosting results in the accumulation of substantial amount of guano on the floor. They swallow soft fruits or extract juice and spit out the remains known as bolus, containing the residual fruit pulp of fibrous fruits and seeds. Besides fruits, they are also known to feed on juice and pollen of various tree flowers. Although flying foxes are widespread species, they are facing threats mainly due to loss of roost trees, hunting and pesticide use.

The Indian Flying Fox is the largest bat occurring in the region and is known to live in close proximity to humans. Anecdotal accounts of *P. giganteus* suggest that some roosts have increasing populations whereas others are decreasing. Isolated studies have provided some insights into possible disturbances and their impacts. However, as a species very little is known about *P. giganteus* population trends in the wild.

Some development work around human habitations and expanding roads have in the recent past affected roosts by the roadside; increasing interest in bat meat and hunting for medicine have resulted in depletion in numbers in some roosts; disturbance to traditional roosts has resulted in bats finding alternate roosts nearby or farther away (Molur and Walker, 1998). Bats have been known to shift roosts from old native trees such as the fig trees to introduced non-native trees such as *Eucalyptus* and *Casuarina*; some roosts are reported to have disappeared (Chakravarthy, 2007).

Heritage site

The property belongs to Mr. Gangadhar who is very much interested and he is ready to donate this site which is about 1 acre with 30 trees of *Ficus* to government agencies if it can be declared as a heritage site and protection is provided to these roosting bats.

There is a small Muneshwara temple in the place where people worship the god and by belief the whole area is protected and conserved. Observations have revealed that the bats are not of any nuisance to the villagers as they do not damage the crops of the farmers and they feed on the sprigs of foliage of *Ficus*, *Madhuka latifolia*, *Eucalyptus* and many other tree species and people have a very good thought for these bats. Interactions with villages using the performa revealed that all supported the idea of declaring the roost as heritage site. The villagers had many reasons for declaring the site as a protected area. The reasons are as follows

- Village with less population – around 150 families having conservation attitude and is well vegetated and villagers want to conserve the bats and trees.

- Bats roosts especially of *P. giganteus* are dwindling and increasing human populations in Karnataka, traditional roosts have been drastically reduced.

- The village (Gidadapalya) has a good vegetation all round and forest lands too, far and near.

- *Lantana* bushes act as Buffer zone- prevents the interventions by cattle and humans to the roosting site.

- Many Villagers are organic farmers- it will encourage farmers to go for organic farming and realize or derive multiple benefits.

- Other animals and birds inhabiting the roost site – Mongoose (*Herpestes auropunctatus*), wild boars (*Sus scrofa*), snakes, birds such as peacocks, woodpeckers, chloropsis, pied cuckoo, owls, etc, hares, rodents and foxes are found here. This indigenous biodiversity elements are crucially important for the productivity of the village. The area has 30 *Ficus* trees-so in addition to bats other biodiversity components too are protected.

- The roost site will be conserved in the long run because the whole community is involved and participatory approach is sustained. As for instance the conservation of spotted pelicans and painted storks in Maddur, Mandya district Karnataka, southern India.

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Table1. Nutrients and microbial composition of guano and bolus of flying fox, *Pteropus giganteus* (range in parentheses)

Parameter	Guano	Bolus
Total nitrogen (%)	2.6 ± 0.5 (2-3.3)	3.3± 0.82 (2-4)
Total phosphorus (%)	4.2 ± 0.8 (3.1-5.2)	4.3 ± 0.6 (3.5-5)
Potassium (%)	0.6 ± 0.04 (0.6-0.7)	0.7 ± 0.04 (0.6-0.7)
PH	7.3 ± 0.1 (7.1-7.4)	7.1 ± 0.3 (6.7-7.4)
Bacteria (cfu/g dry wt)	29 x10 ⁴ ± 50 (25-32 x 10 ⁴)	48 x10 ⁴ ± 28 (46-50 x 10 ⁴)
Actinomycetes (cfu/g dry wt)	5.55 x 10 ⁴ ± 7.8 (5-6 x 10 ⁴)	4.1 x 10 ⁴ ± 7.8 (3.5-4.6 x 10 ⁴)
Fungi (cfu/g dry wt)	2.9 x 10 ⁴ ± 3.5 (3.1-4.3 x 10 ⁴)	4.6 x 10 ⁴ ± 3.5 (4.3-4.8 x 10 ⁴)

Source: Santhosh et al. 2006

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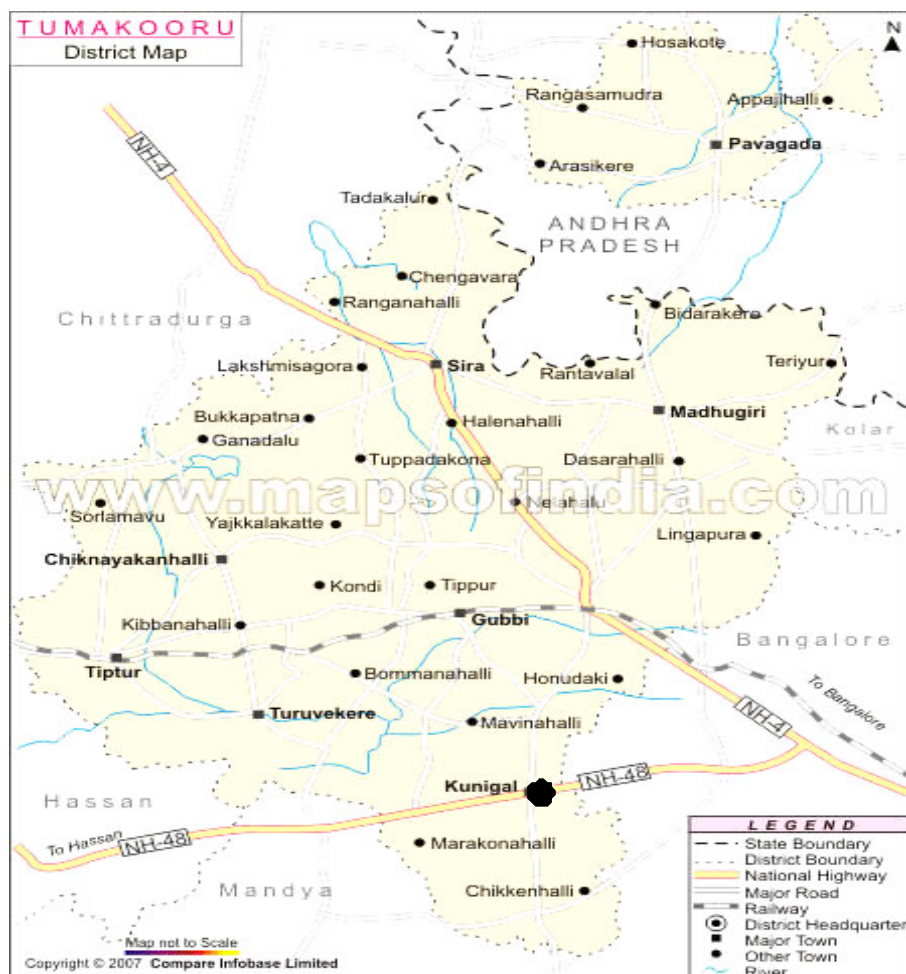
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● Bat roost at Kunigal (Tumkooru)



Status of Roosts of Indian Flying Fox (*Pteropus giganteus* Brunnich) in Karnataka, South India

A.K.Chakravarthy and H.M.Yeshwanth

Opportunistic surveys of the Indian fruit bat (*Pteropus giganteus*) roosts in eleven districts of Karnataka revealed that 30% were traditional roosts (*Pteropus giganteus*) that are more secure than the smaller-sized roosts probably formed out of the main bat roosts. The smaller sized roosts are amenable for disturbance. However, observations during January to April 2008 revealed that all smaller sized roosts were safe and its size also remained almost the same. The traditional roosts are being displaced and disturbed, which results in the fragmentation of the original population.

The major threat to bat roosts has been the destruction of habitat and tree-roosts. It is critically important to preserve the existing bat roosts in Karnataka, because bats play vital role in basic ecology of forests, seed dispersal, regeneration of forests and many trees depend on bats for pollination and seed dispersal. Bat roosts help preserve local, indigenous biodiversity elements.

In urban areas, generally roost trees included *Ficus* species, *Delonix regia*, Mango, Jackfruit, *Eucalyptus* and *Acacia* sp. In rural areas, roost trees included *Ficus* sp. *Terminalia*, *Casuarina*, Tamarind, and *Eucalyptus*. In all, 22 roosts in south Karnataka were monitored, there is a need to monitor fruit bat roosts in north Karnataka. Twenty two percent of the roosts were traditional roosts with the population of bat varying from 1000-3000 varied. The population of seven other roosts vary from 500-1000 bats; 4 roosts of population varied from 100 to 500 bats and 6 roosts have within 100 bats. Thus it is clear that the number of smaller roosts are

increasing and that of traditional roosts decreasing. Urbanization, widespread construction and widening of roads, tree felling along roads and loss of wild fruits has resulted in decline of fruit bat populations.

There is a need to conserve urban roosts of bats. For instance, the police commissionerate on Infantry Road, Bangalore is all set for preserving bats. The sprawling structure is built in u-shape and apart from housing many offices of the police department, it is also home to old trees and a few hundred bats in the compound. For many years, hundreds of the bats have nested in the trees inside the commissionerate. The bats might have caused inconvenience to visitors, nevertheless, the police department is used to the presence of these creatures and has decided not to disturb them.

Chakravarthy (2007); Sanjay Molur (2007); and Venkatesan (2007) have documented status of fruit bats in southern Karnataka. Further observations on fruit bats are in progress.

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Table 1: Observations on bat roosts of *P. giganteus* in Southern Karnataka, 2007-08

S. No.	Location	Bat Roost /tree	Habitat of Roost	Roost size	Status
1	Gowdaregere' Channarayapatna, Hassan (12° 53' 51. 90" N: 76° 22' 44.34"E) , road side tree	2 <i>Mangifera indica</i> trees	On left side of Bangalore - Hassan Road	50-70	Temporary roosts, bats are frequently disturbed by traffic/people & light
2	Chikmagalur Town DC's office + police station (13° 18' 44.35" N, 75° 46' 15.20"E)	<i>Casuarina</i> sp., <i>Eucalyptus</i> sp., <i>Mangifera indica</i> , <i>Ficus</i> sp. <i>Samanea saman</i>	In town, urban built up area heavily used road & residential area	1500-1800	Highly disturbed roost, jungle crows nuisance ground littered with fecal pellets, noisy even during day
3	Bommenahalli, Kunigal, Tumkur (13° 01' 12.94"N, 77° 01' 16.85"E)	<i>Ficus</i> sp.,	Road side tree.	70-80	Road side, disturbed, fragmented population

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S. No.	Location	Bat Roost /tree	Habitat of Roost	Roost size	Status
4	Anchipura, 4km away from Nelamangala cross (13° 05' 56.51"N, 77° 23'13.12"E)	<i>Ficus</i> sp.,	Road side tree	50-70	Road side highly disturbed by moving traffic
5	Mandya Railway station (12° 31'21.94"N, 76° 53' 49.68"E) (>50 yrs)	<i>Samanea saman</i> , <i>Eucalyptus</i> sp.	Garden, tree groups, protected area	150-180	Temple, religious site, safe, well protected, undisturbed area.
6	Bangalore, Bugle Rock park, Basavanagudi (12°56'33.16"N, 77°34' 24.03"E)	<i>Ficus</i> sp., <i>Mangifera indica</i> <i>Samanea saman</i> , <i>Eucalyptus</i> sp., <i>Glyceridia</i> sp.,	Garden, tree groups, protected area	650-710	Maintained by BDA. Farm land before, roost is undisturbed & ancient one
7	Padubdri, Mangalore, NH47 (12° 52' 09.70"N, 74° 50'33.22"E) (<5yrs)	<i>Ficus</i> sp., <i>Samanea saman</i> ,	Built up area heavily used by traffic/human activities	50-60	Fragmented population highly disturbed
8	Mangalore town, Hampanaghatta, Mangalore-1 (12° 52' 09.70"N, 74°50'33.22"E) (>50 yrs)	<i>Ficus</i> sp., <i>Samanea saman</i>	Tree groves amidst urban set-up.	50-75	Disturbed due to noise
9	Tiptur town, Tumkur (13° 15' 12.53"N, 76° 28'41.48"E) (<5 yrs)	Urban grove of trees of <i>Ficus</i> sp., <i>Samanea saman</i>	Outskirts of town, slightly disturbed area	50-60	Fragmented roost, noisy, relatively undisturbed
10	Malleshwarm, Railway station, Bangalore-(13°.00'39.10"N 77°33'42.30"E) (>50 yrs)	<i>Ficus</i> sp., <i>Samanea saman</i> <i>Albizia</i> sp., <i>Cassia</i> sp.,	Religious site, slightly disturbed by traffic and humans	100-150	Temple, religious site, big roost with birds like Mynahs. Safe & secure roost, undisturbed
11	Purashanahalli / Belavangala/ Doddaballapur 13°07'32.46"N, 77°36'15.60"E (>5 yrs)	<i>Ficus</i> sp.,	A village area undisturbed	800-900	Relatively undisturbed, but threats of hunting
12	Bethinagera /Nelamangala (13° 05' 56.51"N, 77° 23'13.12"E) (>5 yrs)	<i>Ficus</i> sp.,	A village social forestry area	600-650	Undisturbed area , but highly threatened by hunting
13	Madhipura/Nelamangala (13° 05' 56.51"N, 77° 23'13.12"E) (>10 yrs) Bangalore Rural	<i>Ficus</i> sp.,	Village area	500-600	Relatively undisturbed
14	Byatha /Doddaballapur 13°07'32.46"N, 77°36'15.60"E (>50 yrs)	<i>Ficus</i> sp.,	Center of village near a temple	700 - 800	Disturbed by human activities, highly protected
15	Ardesahalli/ Doddaballapur 13°07'32.46"N, 77°36'15.60"E (>5 yrs)	<i>Ficus</i> sp.,	Outside the village	1100-1200	Undisturbed, relatively safe
16	Banavadi / Soluoor 13° 6' 8 0.00"N, 77° 23' 24E (>10yrs)	<i>Ficus</i> sp., 3 trees	Village area	1500-1600	Undisturbed area, relatively safe
17	Bettahalli/Yelahanka 13° 6' 27N, 77° 36' 0.00"E (>10 yrs)	<i>Ficus</i> sp.,	Semi urban area	500-600	Disturbed area, with some hunting
18	Gidaddapalya /Kunigal (13° 01' 12.94"N, 77° 01' 16.85"E) (>50 yrs)	<i>Ficus</i> sp., 30 trees	Village area	2600-2800	Undisturbed, safer
19	Sopanaahalli / Gubbi 13° 18' 39.28"N, 76°65'32.04" E (>2yrs)	<i>Ficus</i> sp.,	NH 208	200	Highly disturbed by moving vehicles

S. No.	Location	Bat Roost / tree	Habitat of Roost	Roost size	Status
20	Betthadahelli/Therikerae /Shimoga. 13.9° 55' 20.10"N 75.6°34'13.35" E (>3 yrs)	<i>Ficus</i> sp.,	NH 208	200	Highly disturbed, fragmented
21	Manasa Gangotri, Mysore University. 12°18'11.88"N 76°38'45.12" E (> 50 yrs)	Several species of trees	Inside the Mysore University campus	>1000	Traditional roosts,; undisturbed meets all requirements for bat roosts
22	Aranya Bhavan, University of Wood Sciences and Research Malleshwarm, Bangalore, (13°.00'39.10"N 77°33'42.30"E) (>50 yrs)	Several species of trees	Well protected, breeding occurs	>600<700	Traditional roosts, undisturbed bats forage long distances for food

Bat Colony in and around the Kodinar Taluka of Junagadh district, Gujarat State

L. Muthu Andavan, S.F. Wesley Sunderraj and Justus Joshua

Species	Location	Geographic Co-ordinates	No. of individuals	MSL (m)/Temp	Associated Tree	Surrounding Ecosystem
Short- nosed Fruit Bat- <i>Cynopterus sphinx</i> (Vahl, 1797)	Roonaj	20°48' 27.3"N 70° 43' 42. 3"	664	26/33.3° C	<i>Ficus bengalensis</i> and <i>Azadirachta indica</i>	Agriculture land with cultivation of sugarcane- and one human settlement in the highway road, <i>Ficus bengalensis</i> fruiting with prop roots, in the cool atmosphere. Mating also observed while survey.
<i>Cynopterus sphinx</i> (Vahl, 1797)	Peechva	20°55' 8.3"N 70°51' 2. 3" E	374	78	<i>Ficus bengalensis</i>	<i>Ficus bengalensis</i> is fruiting and flushing, Agricultural ecosystem surrounded by bamboo, typha, coconut, phoenix and mango with one human settlement with screening and facial materials are expelled out below the tree and flapping of wings and mating is observed
<i>Cynopterus sphinx</i> (Vahl, 1797)	Kodinar (Town)	-	6	-	In the human settlement	Surrounded by the human settlement and agriculture land
<i>Cynopterus sphinx</i> (Vahl, 1797)	Sinsar village	20°49' 10.8"N 70°35'36.0" E	182	24	Associated with the <i>Ficus bengalensis</i> and <i>Ficus religiosa</i> in the upper territory and lower branches of coconut also	Agricultural land ploughed with hedge mango trees
Indian False Vampire – <i>Megaderma lyra</i> Geoffroy, 1810)	Thordi (Sacred grove)	20°47' 28.6"N 70°35'58.0" E	74 (two seasons) Monsoon and Winter)	16/32.8 °C	Inside the ruined Shankabhavan temple	Surrounded by agricultural ecosystem

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Status and distribution of Indian Flying Fox in Kathmandu Valley, Nepal

Pushpa Raj Acharya*

A baseline survey of Indian Flying Fox (*Pteropus giganteus*) was carried out on July 2006 to February 2007 in the Kathmandu Valley with small grants from IUCN Nepal. The study is probably the foremost practice to study about a specific species of bat from the native bat researcher in Nepal. The study area is located between 27°32'34" to 27°49'11" N and 85°31'10" to 85°31'32" E at altitude 1350m from sea level. The saucer shaped valley possesses the warm temperate climate. The intensive study area consists the most urbanized historical cities including the capital of the country surrounded by mountain peaks through all direction.

The valley was found providing the diurnal roost for this gentle species probably since last 200 years ago. During the study, three Ptero-camps were found. Keshar Mahal Ptero-camp and Sallaghari Ptero-camp were for summer resting purpose and Gokarna ptero camp has been found only at sever winter though interrelationship among them was not ascertained at this study.

Among the three camps, Sallaghari was found with most population (with an estimated 1324 individuals) during November 2006. Kesharmahal Ptero-camp was found most threatened due to ongoing habitat loss, roost ageing and lack of conservation efforts where about 801 bats were counted as peak population during November. Gokarna Ptero-camp was found as newly established camp and bears small colony of bats.

In Nepal, Flying Fox has not getting specific conservation efforts for want of information and lack of awareness. The species has found in great danger of existence in their traditional camp due to habitat loss, rapid urbanization, hunting, and people's negative perception towards bat. The great danger to these bats is due to their nature to roost near by human settlements. The people get irritated and aggressive due to their noisiest mobility at every dawn and dusk. The exact as well as estimation counting method was used to assess the population size of bats in each roost. The following count has been obtained during the study.

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Table 1. Seasonal Population Dynamics of Indian Flying Fox at Keshar Mahal Camp			
S.No.	Date of census	No. of tree-roost	No. of individual
1	18 July, 2006	MS-9, PS-20	293
2	18 Aug, 2006	MS-10, PS-23	459
3	16 Sept, 2006	MS-10, PS-23	701
4	13 Oct, 2006	MS-11, PS-23	781
5	11 Nov, 2006	MS-11, PS-23	809
6	25 Dec, 2006	MS-4, PS-22	478
7	13 Jan, 2007	MS-2, PS-16	348
8	23 Jan, 2007	MS-0, PS-9	117
MS: Sports and Education Ministry Side, PS: Narayan Hitty Royal Palace Side			

Table 2. Seasonal Population Dynamics of Indian Flying Fox at Sallaghari Ptero camp			
S.N.	Date of Census	No. of Tree-roost	Total No. of Individual
1	3 July, 2006	18	350
2	26 Aug, 2006	25	459
3	10 Sept, 2006	33	871
4	26 Sept, 2006	66	1102
5	1 Nov, 2006	44	1324
6	16 Dec, 2006	36	691
7	13 Jan, 2007	-	No bats

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Chiroptera, Chiuri and Chepang

Pushpa Raj Acharya*

Bats are of great ethno biological value in Nepal. Nepal has three types of geographical features; the plain region on the south, the hill on the middle, and the Himalayan region on the north. In these regions, people live with various cultures and belief. About 100 ethnic groups with distinct language and culture live in Nepal. More than 60 languages have scripts. Bat is the least studied mammal group in Nepal. The country's diverse bat fauna is constituted by 54 documented species in seven families. An additional seventeen species are known from nearby areas in India.

In most of the language including national language 'Nepali', bat is named as 'Chamero'. But few ethnic names are also found. 'Chikalapa' in Newari, 'Phabung' in Tamang, 'Situwa', 'Kanputari' in Maithali, Badur in Bhojpuri, Baddi in Jhagad, Chepangs in Rai, etc. *Chepang* is the most important vulnerable indigenous group in Nepal. The Chepang rely considerably on the forest for much of their subsistence. They possess a sound knowledge of habit, behaviour and utilities of various non-traditional flora and faunal resource. They are still effective food gatherers, talented in hunting and perseverant fisherman.

One of the recent ethno biological studies has reported that these groups are found consuming 127 species of animals and 354 species of plants. Among 127 animal species 107 includes vertebrates and remaining 20

species of invertebrates. Among them only 10 species are domesticated and remaining are all wild.

Regarding Chiroptera they have interesting story in Chepang community. They use the bats as a delicious food item. They use dried flesh and skins in ethno medicines to cure gastric ailments, psychosomatic diseases and reduce high blood pressure. They have different name for fruit bat and insectivorous bat. They call *Pteropus* as Raniwin, *Cynopterus* as Rowin, *Rhinolophus* as Dhankacha and *Myotis* as Syawin. For bat hunting tribal people use latex derived from Chiuri Plant (*Madhuca butyracea*; family sapotaceae). It is commonly called Indian butter plant. They called it as Yelsi, or waksi in their language. The fresh latex is applied at roosting spots such as stem, branch and leaves of the Chiuri plant. At the flowering time Chiuri bats come to take juice at night. Chepang catch these bats by net. During these months one Chepang young can hunt more than 10 bats per night. Thus Chiuri plant is used as bat hunting bait. They have interesting historical, cultural myth to worship Chiuri plant as the milk giving buffalo. It is urgent to study on pollination and seed dispersal phenomena of bats on the Chiuri plant. Their holy plant; the Chiuri will stop to fruit due to lack of pollinating agents like bats.

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One day training programme on bats, organized at Bat Cave, Pokhara, Nepal

Hari Adhikari* and Mohan K.C

NOTE: Please refer the web version for the excellent colour photos provided with this report. SRW, Ed.

Introduction

Pokhara valley is located in Kaski district of western region of Nepal. The precise geographical location of the valley is between 28°24' to 28°4' N and 83°99' to 84°65' E. The average height of the Pokhara valley above the sea level ranges from 730m to 1030m. The main precipitation here occurs in the form of rainfall. The climate is sub-tropical but due to the elevation, the temperatures are moderate: the summer temperatures average between 25-35°C, in winter around 5-15°C. Bat cave is famous for its picturesque appearance of bats on the cave. Bat cave is situated in the northern part of Pokhara valley in Batulechaur. It is famous tourist site of Pokhara valley for seeing bats and enjoying adventure of cave walk. One day field training was organized in Bat Cave among Bat Friends general members, bat cave guide and few interested tourist. The participant were trained by Mr. Hari Adhikari, (Coordinator, Bat Friends), Mr. Mohan K.C, and Mr. Niroj Man Shrestha.

Objectives

- 1) To demonstrate materials used in bat capture, technique for bat identification, measurement to be taken of different body parts, methodology for bat capture.
- 2) To make participant aware about bats handling.
- 3) To identify bat species and population status of bats in Bat cave.
- 4) To examine existing threats in the bat cave.

Methodology

- 1) Selected group members, care taker of bat cave and bat cave guide were equipped with information about materials used in bat capturing and identification like mist net, butterfly nets, spring balance, vernier caliper, hand gloves, bat keeping bag, reference book "Bats of the Indian sub-continent" etc.,
- 2) Measurements of body parts are essential for bat identification. So the participants were trained about the way to handle them, take measurement, and release safely. Participants were very enthusiastic to know more about measurements, so each of the participants were trained to safely handle bats during measurements.
- 3) To identify bat species found in Bat Cave, captured bats were taken for study. All participants were very keen interest on identifying bats. Body parts of bats like wing length, forearm, head and body length, tail, ear, hind foot, tibia, etc. were measured. And reference book "Bats of Indian Subcontinent" published by Bates and Harrison was taken for comparing the measurements and bat identification. Ten samples of bats representing

different areas of cave were collected and later released. Population status and number of bats were observed by taking the average population per square meter at different place in the cave and finding the total area covered by bats in the ceiling of cave and multiplying by average. A total of 1,500 bats were found on an average.

- 4) To examine the threats local peoples as a key informant's interview were done. Local leaders from different field were invited and discussion was conducted among them. Direct field visit was also done during research study.

Outcomes

- 1) Participant got information on bat related equipment required for bat capturing and identification. Participants were capable of capturing bats for the study.
- 2) To make them aware about methods of bats handling the knowledge were shared freely to the participants. They were also trained how to take the measurement of bats different body parts. Participants gave response of getting confident on handling bats.
- 3) On the basis of measurement taken, two species of bats were listed, *Rhinolophus armiger* and *Rhinolophus pussilus*, These data were matched in reference with "Bats of Indian Sub-continent" and M.Sc., thesis of Acharya.
- 4) During discussion with key informants and direct field visit, problem like high tourist pressure in the cave, roosts disturbance, throwing litters, throwing stones on bats, making loud noise, and pointing direct focus light on bats etc. were observed. These threats are the main cause of declining bats in that cave. Two dead bats were found during cave visit and on observation the wings had holes on it. It seemed some illegal activities of tourist hampering bats and their population. Later these dead bats were handover to Institute of Forestry, Department of Park Recreation and Wildlife management for specimen's collection of bats for campus zoology lab. Both dead bats were of *Rhinolophus armiger*.

Recommendation

There is need of preparing and installing information and notice board for tourist to provide them full information regarding behaviour of bats, their status, species found in cave, and some request for not to disturb them in their roost, publication and distribution of brochure and information prior to their

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Bat Friends Coordinator showing bat to participant



Students busy intaking data on bat measurements



Bats in Bat Cave6



Students observing dead bats outside the Bat Cave



Students observing the ceiling of cave



Student taking measurement with Spring balance



entry in to the cave so that they could understand the value of bats and keep their roost sound and healthy. Broad awareness campaign needs to be conducted for the conservation of bats and to create interest in bats observation, its roosting site preservation, and to remove myth that exist in their mind about bats.

Conclusion

Each of the participants got an opportunity to handle bats and take measurements and the ways to match the measurement with the Book Bats of the Indian Sub-continent. During the program different materials information prepared by Bat Friends were distributed to the tourist and they were happy to see the bats in the cave in huge numbers and get more information regarding bats.

Acknowledgments

We would like to acknowledge respected resource persons and organizers of the recent CCINSA/RILSCINSA training program in bat and rodent field techniques for giving valuable pointers for studying bats and providing materials. Thanks to Mr Subash Adhikari, cave caretaker for assisting us in the program and other bat guide of the cave to assist us on handling bats. We also thank Mr. Niroj Shrestha for organizing the program.

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Reporting *Pteropus* colonies and Bat roosts from Eastern Nepal

Sanjan Bdr. Thapa*

NOTE: Please consult the web version of Bat Net to see the photographs accompanying and illustrating this article. S.Walker, Editor, Bat Net

Bats are well distributed in tropics and sub-tropics. In Nepal, the Terai (plain) harbours a good diversity of bats. Most commonly destined *Pteropus* colonies. Koshi Tappu Wildlife Reserve (KTWR), the first and biggest Ramsar site of Nepal can be a destination of bat study. During my visit in October 12, 2007, I was informed that microchiropteran roosts are present on the roofs of headquarter office and guesthouse at Kusaha, Sunsari district. The ranger Jha expressed the stinky odour of their droppings casts. A few bats were seen drinking water in the nearby private ponds and wetlands of KTWR in the evening. In *Maithilee*, a local language, microchiropterans are called "Chamgudri" or "Kanputri" and "Baadur" to *Pteropus*. In *Jhangad*, another local language, all bats are called "Badri". The villagers of Kusaha VDC reported that microchiropterans roosts inside the hollow bamboo of thatched roofs.

Next day, I headed north to Prakashpur VDC, two hours cycling from Kusaha VDC in search for *Pteropus* colonies and bats informations. Hari Bhattra, a clerk of VDC office informed the presence of large group of microchiroptera on the roof of one of the room of the previous VDC office. Now the office building is owned by armed police force. However, I could see only droppings casts but no bats. In the cupboard of Sunshine Boarding School, 5-6 bats come out whenever it is opened said local journalist, Baburam Karki. There is a huge colony of about 400 individuals of *Pteropus giganteus* roosting in a Simal tree (*Bombax ceiba*).

Next day, I reached Pathari VDC, Saptari, the western Bufferzone area of the KTWR. At the border of the KTWR and the Bufferzone area, a *Pteropus* colony of about 200 individuals roosting on a Simal tree

(*Bombax ceiba*), on the dam of Koshi River was observed. The colony is just near Binda Sardar's house. According to him, some of them had migrated to Hanumannagar, Saptari.

According to a local resident, in Tanmuna VDC, Sunsari, 3 Kilometers south-west from Duhabi, there is a large colony of about 500 individuals of *Pteropus giganteus* roosting in a large Simal tree (*Bombax ceiba*).

After Dashara, November, 2007, I visited Barahachhetra. I was informed that bats roosts in Siddha Gupha (Cave). According to a local fisherman, they also roost in hydrological observation holes of SKSKI project. I was able to see a few among 35 such holes, located at Ahale VDC, Dhankutta, north to Triveni Bridge at Barahachhetra. I was informed that bats are called Chhepale in Bantawa Rai's language and the bat feed on Chyuri, Nepal butter fruit (*Aesandra butyracea*).

In Bhojpur district, large numbers of microchiropterans are seen flying at forest of Saileshwori temple, in the evening. In Okhaldhunga district and Diktal, Khotang district bats are used to cure Lommute (Red urination) of cattles. For this bats are caught and pieced finely and mixed with grass or straw and then fed to cattle.

In Saptari district, a *Pteropus* colony of about 300 individuals roosts on Tamarind tree at Rajdevi temple, Rajbiraj-9. Another colony of about 400 individuals in a simal tree is at Gadiyadhuri village (Bansbitti VDC), 2 Kilometers north-west from Rajbiraj-Rupani highway. Temporarily, such colonies are also found in Balarda, Tulshipur chowk, Fathepur.

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Pteropus colony at Pathari VDC



A hydrological observation hole



A pair of flying fox hanging in coconut tree



Pteopus colony at Golchha house,
Biratnagar



Pteopus colony at Kerkha, Jhapa



I could observe the best and interesting *Pteropus* colonies at Biratnagar, Morang, my home sub-metropolitan city. More than a thousand individuals of *Pteropus giganteus* are roosting in simal trees, sissoo (*Dalbergia sissoo*), Mango (*Mangifera indica*). It was interesting to observe very few hanging on coconut trees. Before the single colony was at a large simal tree in front of Atithi sadan (Guest house). They are now translocated to more than five divided colony, two inside Golchha house and three inside the CDO office. These colonies are the noisiest among the colonies I have observed. In the early evening, a few individual revolved round the trees and slowly others also leave the tree. At 5.45 pm they fly towards eastern, western, northern and southern directions.

Those flying to the south return to other directions. At 6.00 pm the roost was emptied and the next morning all arrived at 5.00 am at Golchha house. Later, at 9.00-10.00 pm they revolved round and settled. A colony settled at CDO office. According to Guards at CDO office, Chidimar (bird hunter) kill bats for medicine. According to a tari seller, bats suck tari from the trees as well as from the pot and are sometime caught in the nets.

In Keroun VDC, Morang, microchiropterans roosts on the roof of the houses. So is in my colleague, Kamal

Nepal's house. Because of the disturbing stinky odour of their droppings they are killed. For killing a bat N.Rs 2 is paid. Sometimes they spray Phenyl on the roof. Nearby his house is a large dried simal tree where *Pteropus* colony existed five years ago.

I was also informed that there is a Chamere Gupha (bat cave) in the Churia hill, One day walk north from Letang.

Good diversity of bats can be insighted in Jhapa district. My colleague, Padam Rizal informed that people are suffering a lot from bats at Kechana kawal, the lowest place of Nepal (60 m from sea-level). In District forest office, Kerkha, more than a thousand individuals has colonized since five years. They roost in ten trees of two different tree species: sissoo and Masala (*Eucalyptus*). According to a staff in the office, they have migrated from south because of disturbances and killings by Satar (indigenous native). They feed on the flesh of bats. At the evening they leave the roost for foraging towards south.

During my visits I could find people of the eastern Nepal has negative attitude towards bats and scarce knowledge towards its importance and nullified attempt for its conservation.

From Radio Annapurna to Nepal

Hari Adhikari*

Perhaps the first radio Bat Conservation and awareness program in Nepal was launched through Radio Annapurna 93.4 MHz on Programme Samrakchan (Conservation) for 3 weeks December 1-15, 2007.

The Program was broadcast every Saturday from 5:40pm to 5:55pm. It was targeted to all ages, including children, adult, and professions or levels, e.g. intellectual circles, students, office workers, ladies, business people, etc. Overall information topics were disseminated to the local community are as follows:

What are bats? Where are bats found? How does a bat look? How big? How small? What colours? Home of bats, Eyes and Ears, Hibernation, Migration, Reproduction, Kinds of bats, Importance of bats, Ecology, Threats, Hunting and trade, Species in trade, Bats in legislation and Red List, CITES listed Bats, Myths about bats, Myths Reality, What can we do for the conservation of bats, Bat boxes and bat house, Bats as pets and so on.

Based on the fact sheet published by Radio Annapurna 93.4 MHz the coverage area includes three large zones mainly Lumbini, Gandaki and Dhaulagiri of which following the areas were covered Kaski, Pokhara, Lekhnath, Tanahu, Damauli, Nawalparasi, Gaidakot, Tandi, Kawasoti, Chitwan, Bharatpur, Gunjanagar, Tiger Tops, Mugling, Manakamana, Manang, Gorkha,

Lamjung, Tanahu, Dumre, Bandipur, Besisahar, Syanja, Myagdi, Parbat, Baglung, Palpa, Argakhachi, Gulmi, Makwanpur and Dhading.

An estimate was made of approximate listeners who were directly and indirectly covered could range from 3.2 to 5.2 million. The Bat friends committee would like to thank Mr. R. J. Sarad Paudyal for his volunteer support and Radio Annapurna 93.4 MHz for broadcasting important information regarding bats to the local community.

The information for the programme was taken from "Guidelines for an Education Programme on Just Bats about Bats" Concept Design by Sally Walker and was translated into Nepali language by Bat Friends committee members. On other dates, this information also was broadcast through next radio Rupendehi F.M 102 MHz to cover other regions of Nepal which were not covered by previous radio. People in the region were informed that they could listen to the program from Rupendehi F.M 102 MHz on every Thursday from 6.15 am in the morning and provide feedback to us the batters who organised at the reporters email address.

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2007 Bat activities (bactivities!) Review

The following is a brief review of some of our important activities with a pile of new educational material, training in a new country (Nepal), new members, website upgrades, and publications in our journal, magazine and newsletter and a future plan. The network is sponsored by Chester Zoo and BCI.

NETWORKING

CCINSA continued its networking activities through 2007 often using the internet extensively to stay in touch and to send bat articles, news events and opportunities to all 300 members of the Network. In 2007 there was only one longish newsletter and some of our newsletter authors indicated a preference for two newsletters of medium length rather than one large one. In addition to Bat Net Newsletter, our batters publish in the Journal and occasionally in our magazine.

[http://www.zoosprint.org/ZoosPrintNewsLetter/Bat%20Newsletter%208%20\(1-2\)%202007.pdf](http://www.zoosprint.org/ZoosPrintNewsLetter/Bat%20Newsletter%208%20(1-2)%202007.pdf)

CCINSA Directory Recently updated, this is a web based Directory which is updated from time to time. It contains a lot of information about some researchers who send more about themselves and helps new batters to find people to help them with their sticky questions. The Directory also links the South Asian network to all other batters in the world which belong to a network or group with a website. Thanks to BCI and Chester Zoo we could update it in 07. www.zooreach.org/Networks/Chiroptera/Batdirectory06.pdf

TRAINING

Nepal was the venue of the June 2007 Training in field techniques which introduced many Nepali's to bats as an exciting academic pursuit. It is reflected in this newsletter which is virtually dominated by Nepal members' articles and reports. If you missed the report of the workshop in the last issue of Bat Net, you can still refer it on the website. Training sponsored by BCI, Chester Zoo and Knowsley Safari Park.

EDUCATIONAL MATERIAL

Drama kits have been developed for several of the taxon groups we promote and it was time for bats. Drama is a good education medium as you can conduct it without language problems. Many dramas can be done without speaking at all which increases the challenge and also the fun. The Drama kits help conservation educators teach people of all ages very effectively by organizing school or village programmes which feature conducting dramas in which bats have a central role. This project was sponsored by BCI. You can check this out on the our websites. www.zooreach.org/downloads/ZOO_Educational_Materials/Bats/Bat_2007_packet.zip

CCINSA tries to keep a supply of educational packets on hand for people to order and use to teach about bats. Last year we developed new ways to educate people using our packets and also a South Asian Bat Colouring book for younger kids. Because

the colouring book gives information about bats and their favourite foods, it is interesting to "older youngsters" also. Sponsored by BCI.

www.zooreach.org/downloads/ZOO_Educational_Materials/Bat_colouring_book_and_guideline.zip



Using the Web for education with Website illustrations of S. Asian bats: **You can visit our web site: www.southasiantaxa.org and search by Family and using key word "Pteropodidae"** or you can go to the site www.southasiantaxa.org and search by Family and using key word "Pteropodidae"

Another website having to do with fruit bats is run by our colleagues Sanjay Molur and Sharoukh Mistry. It is called **PteroCount** www.pterocount.org. This is the world's first project for volunteers to survey the bat roosts of such a large locality as South Asia. We also have much bat network correspondence by which we help network people and are grateful for an administrative component to the support we get from BCI and Chester Zoo.

2008 PLANNING

1. Bat Literature for Public Education

Additional copies of packets and drama kits have been made with improvements and changes made. Great new fruit bat poster-packet sets have been made with BCI support.

2. Additional Threatened Taxa Monitoring System tms website and field guide illustrations have been finished for fruit bats and now we are taking up insect bats.

3. Training in field techniques was tentatively planning for Bhutan but we were unable to find contacts there to help. If anyone has a colleague with interest in field techniques training for bats, please contact us and put us together.

4. Support for Bat Clubs resuscitation and improvement. We have support from BCI for new and old Bat Clubs.

Selected Bat Education Programmes for Animal Welfare Fortnight and World Environment Day

Animal Welfare Fortnightly

Samrakshan Mizoram - Bat Conservation Education and Awareness - Animal Welfare Fortnight – 2008

Activities were initiated for Animal Welfare Fortnight 2008 followed by an energizer in form of body writing which we enjoyed as much as the children. We showed them a few photographs of bats that we had taken in course of survey in the landscape. While most children said that had seen the Lesser false vampire bat they were confused about others, one of them however said he had seen the Andersons leaf nosed bat in the bamboo grove near the school. We then moved on to giving them bat colouring books prepared and supplied by Zoo Outreach Organization and Bat Conservation International, and crayons to colour. While colouring we shared sweets with the children and teachers and after colouring suggested the children to select some of the coloured bat pictures and put them up on the school walls.

With the elders we interacted with people representing the local youth club, the forest department and the village councils. Here the introduction to Samrakshan was in greater detail and also met with questions on our immediate plans to set up base out of Saiha or expand the team. While interacting with some of them at the tea stall and also in course of inviting them we felt the need to present a detailed introduction on what we meant by conservation education and awareness. Towards this we discussed the recent training attended by us, shared some material including masks and booklets with them as also our experiences on the subject besides what we proposed to work on in the landscape. **Submitted by: Nimesh Ved, Samrakshan Trust, Saiha, Mizoram.**

Animal Welfare Fortnight 2008 celebration at Indira Gandhi Park Zoo and Deer Park, Rourkela

Animal Welfare Fortnight, year 2008 was observed at Indira Gandhi Park Zoo and Deer Park during 14th January to 28th January 2008. Various awareness and zoo education programs were arranged during this fortnight. The students and teachers of Delhi Public School Rourkela visited the Indira Gandhi Park Zoo on 15th January 2008 under the zoo education program.

One grand wildlife awareness program was conducted on 22nd January during the Animal Welfare Fortnight at Indira Gandhi Park Zoo. Sri. R.N. Panda, DGM (Sports and Horticulture) graced the occasion as chief guest with Sri A.S. Sarangi (AGM Horticulture), who was present as an invited guest for the occasion. Total sixty two participants from Deepika English Medium School, Sector 5; Delhi Public School, Sector 14 and Vajirout English School, Sector 4, Rourkela were present. All participants belonged to eco-clubs of their respective schools and were accompanied with their biology teachers. Mr. Bijoy

B. Mathur and Mrs. Tanuja Panda from DPS and Mrs. K.S. Hyme were invited as resource persons for a talk on wildlife conservation. During the programme education materials containing information regarding Primates, Bats and Amphibians were distributed among the participating children. Two Drama kits (monkey and chiropteran drama) were presented to eco-club head of Deepika English Medium and Delhi Public School for the play by the invited guests. The education packets contained booklets, masks, stickers and rakhi provided by the ZOO. The importance and other related information regarding Primates, Chiropterans and Amphibians was discussed in detail by our resource persons with the participants. **Submitted by: Dr. Ravi Kumar Singh, Curator, Indira Gandhi Park Zoo & Deer Park, Rourkela, Orissa**

RMNH, Bhopal celebrates Animal Welfare Fortnight 2008 with Bats

On 22 Feb 08 the Regional Museum of Natural History, Bhopal conducted a one hour programme on bats at the Orion Intl. School in Bhopal. There were 50 students of class 6-8.

Shri Manik Lal Gupta explained to the students about range, habit, habitat etc. of fruit eating and insectivorous bats. He narrated that bat wings are very delicate and richly supplied with blood vessels and so injury to the wings get healed quickly. He added that vampire bats prefer cattle blood and rarely take human blood. They are found only in South America. He pointed out that population growth rate of bats are very slow, only one pup per mother; sometimes twins produced in a year. While describing co-friendliness of bats, he said that one insectivorous bat can eat roughly 600-1000 mosquitoes and other insect pests in one night! He brought to the notice that they also kill other insects like bugs, which destroy fruit and other trees and small mammals such as rodents that destroy stored grains and other crops. Thus they play an active role in pest control. Bats living near you home could keep you free of insect bites and other troubles caused by flying insects. During this programme *Rakhi* were distributed and students sworn that they would take care of dwindling population of bats near to their school or home. Mr. Gupta suggested to students about better use of resource material kept in packet arranged by Zoo Outreach Organisation, Coimbatore and sponsored by BCI. **Submitted by: Dr. S. Sethuramalingam, Scientist-in-Charge, Regional Museum of Natural History, Bhopal, Madhya Pradesh**

IABWS celebrates bats during Animal Welfare Fortnightly

International Animal & Birds Welfare Society, Guttur, Anantpur District and SEVEN NETWORK which is a Group of 7 NGOs, jointly celebrated Animal Welfare Fortnight from 18th Jan to 31st Jan 2008 in Seven Mandals Schools. Zoo Outreach Organisation, Coimbatore provided Educational packets for educational programs.

A programme was held at Z.P.H. School, Bandlapalli on 24 January based on a quiz. Participants included 25 students from 5 schools in collaboration with ACTION Rural Development Society – Penukonda. IABWS organized a Quiz competition for class seven to ninth students who were divided into two groups. Co-ordinator S. Basheer explained about importance of wildlife welfare and the role of the students. He also explained the status of wildlife and their present, past and future conditions. The participants were grouped into four teams one of which was Bats with five members in each team. They had five rounds of questions all related to wildlife and welfare.

Another programme featuring a drama was held with 30 students of Z.P.H. Girls School, Puttaparthi on 28 January in collaboration with Rema Sai Rural Development Society. IABWS educational officers conducted a variety of games for school students. **Submitted by Mr. G. Manjunath, Project Director, International Animal & Birds Welfare Society, Guttur, Anantapur, Andhra Pradesh**

World Environment Day

Advancing Bat Conservation on WED

This programme was held on 5th June 2008 on the World Environment Day and Karuna club members of USAK High school, Arua Kadaliban participated.

The World Environment Day (WED) is observed annually on 5th June as an opportunity to raise awareness and promote action on environmental issues. APOWA (Action for Protection of Wild Animals), through its various programmes reaches out to students, youths and people in general and creates awareness on environmental issues. The event includes competitions for children, Drama, Games, film shows, distribution of awards etc. These programmes are also the principal way of spreading the message of World Environment Day on June 5.

We are thankful to Zoo Outreach Organisation, Coimbatore for supplying us educational materials, which makes our programme more colorful. The games & materials structured / developed by ZOO is wonderful. While we play we act dynamically and we feel the process of nature. Every participant understands the concept & strongly advocate for environmental conservation. Student must be the ambassador of environmental issues, for the environment student and environment is inseparable. Each student can contribute significantly to protect its environment. They will act as local environment saver. Actually saying the materials help students to understand their environment and wildlife. Events were very small but interesting. We invited resource persons for each event for observation and evaluation of World Environment Day programme. APOWA has been observing World Environment Day since its inception in 1999.

Kundu gave a talk about the Bat conservation to participants in the beginning of the event.

Bat theme based Games and Drama

Drama 1: Bat threatened by their environment:

A group of students performed the game on the theme of bat conservation. Before the drama the educator explained about the theme to performers.

Drama 2: Creating a Bat Site

The above drama was played by the students of Karuna club members of USAK High school, Arua Kadaliban.

This play was guided by Shri Pravat Ku Nayak of APOWA.

Painting Competition: S. Asian Bats Colouring Book

There were 15 children of age 6-12 years participated in this activity. This colouring book was intended to create interest among children about Bats. In the beginning of the event the educator Shri Manamohan Kundu explained about the objective of the event to participants. **Submitted by: Bijaya Kumar Kabi, APOWA, Orissa.**

Using bats to help tropical reforestation

Correspondent : Staff Reporter

LONDON: German scientists have hit upon a novel yet cost-effective idea to revive reforestation in the tropics - by using bats as seed dispersers. They have designed bat roosts - replicating large, hollow trunks - to boost seed dispersal of a range of tropical plants. "So far we have found 10 bat species using the roosts, and several of these are common and important seed dispersers," said Detlev Kelm of the Institute of Zoo and Wildlife Research in Berlin. "We measured the effect of the roosts on seed dispersal and found seeds of more than 60 plant species being transported by the bats." Tropical forests are of global ecological importance as they regulate carbon balance and host much of the world's biodiversity. Between 2000 and 2005, net losses of tropical forest cover averaged 0.18 percent annually and regionally even exceeded 1.5 per cent in some Latin American countries. Forests are usually replaced by agriculture and end up depleting soil of nutrients. Deforested areas rarely offer much food or protection for seed dispersers such as birds or mammals, so regeneration is hampered by a lack of natural seed inputs. The alternative, replanting tropical forests, is too expensive and hardly a feasible option, and knowledge on how best to rapidly restore natural vegetation is generally lacking. "We believe that bats could help in reforestation. They are able to cover large distances during their nightly foraging flights and are willing to enter deforested areas," said Kelm. These findings were published in Conservation Biology . **SOURCE : Times of India, Tuesday, 29 April 2008**

Samrakshan Mizoram - Bat Conservation Education and Awareness - Animal Welfare Fortnight – 2008



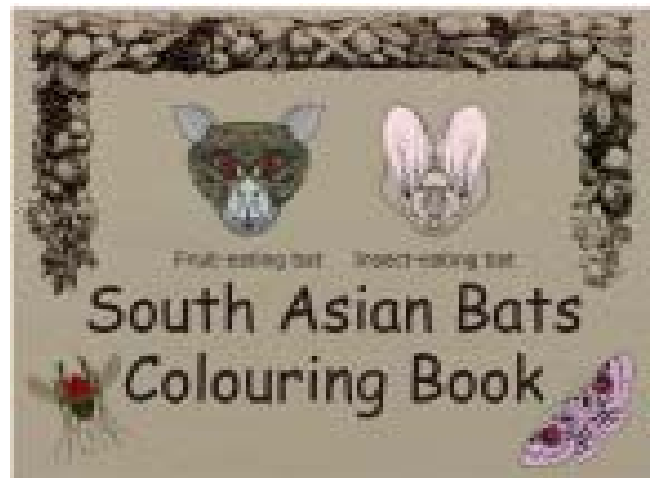
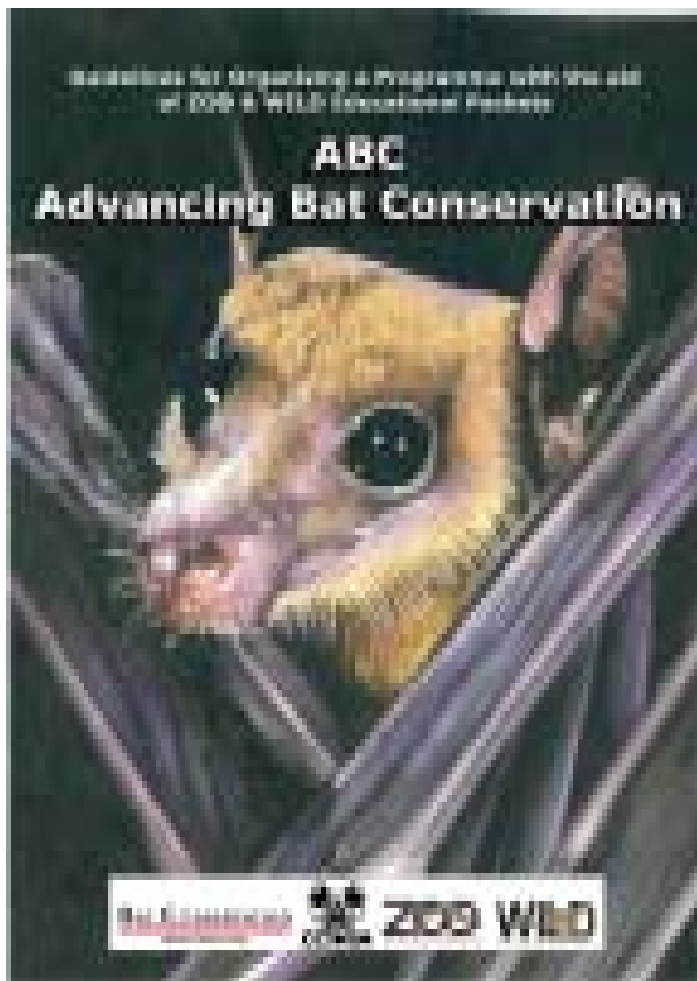
RMNH, Bhopal celebrates Animal Welfare Fortnight 2008 with Bats



IABWS celebrates bats during Animal Welfare Fortnightly

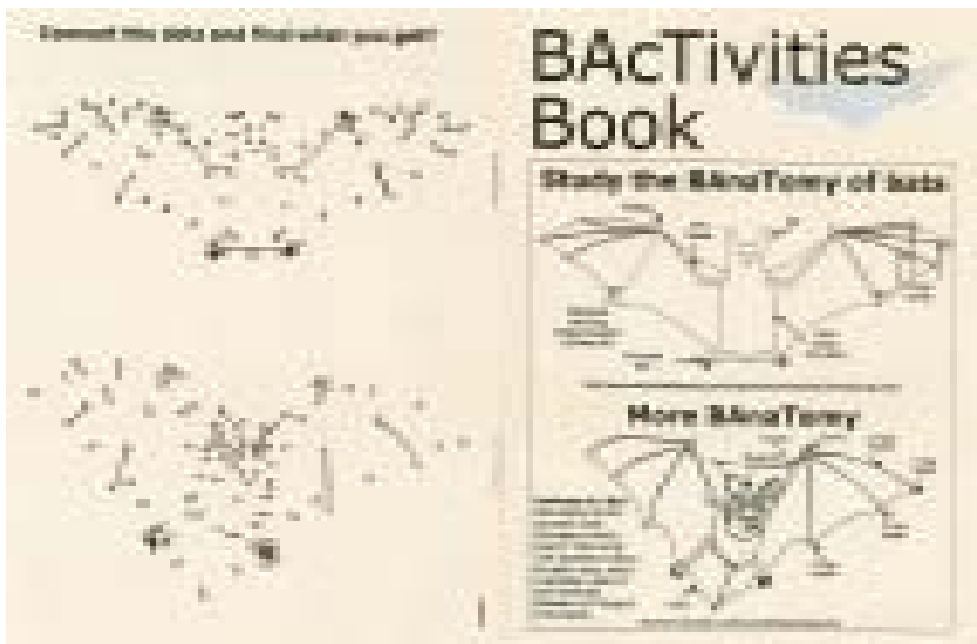


Bat Educational Material developed recently



This colouring book is specially made for school students to give an introduction to South Asian Bats. The book help students to understand how bats are classified based on their food habits. The fruit eating which feed on riped fruits help in pllination. Aspects on role of insect eating bats on the control of insect pests are hilighted. The colouring book also introduces various habits of bats.

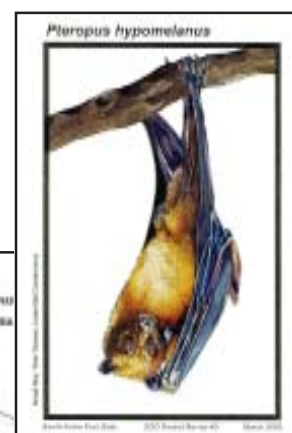
This booklet of educational guidelines is specifically for use with our NEW bat packet of beautiful illustrations of fruit bats drawn from photographs collected from BCI collection as well as Lubee and CCINSA members. Suggestions are given for use with different age groups. You can see the pictures on our website for ttms at www.southasianntaxa.org.



This is an updated but smaller version of our BACtivities Book which has study activities which are easy to do and a lot of fun. We have included a copy of this in our recent bat packet.

This can also be ordered as a pdf for review before ordering for education by writing to pravin@zooreach.org. Pravin will send you a copy immediately. Be sure and ask for it by name.

You can, of course, order hard copies either of this booklet along or of the entire packet (described on the next page) for your education programmes by sending a small proposal with your request informing us how you plan to utilise the books. Again, you can get a format by writing to Pravin : pravin@zooreach.org or Marimuthu: marimuthu@zooreach.org



Pteropus (Fruit bat) posters and bat cards !

Originally conceived as a large poster for use by PteroCount volunteers, these *Pteropus* posters evolved to a collection of "handlable" 5X7 posters of all the fruit bats and a set of small "baseball card collection" mini cards. Both of these will be useful for Pterocount volunteers but also by our bat educator community which grows larger all the time.

We have developed a set of guidelines incorporating different ways of using these colour cards of 13 different fruit bats for different age group. The guideline is to introduce the subject of fruit bats with a demonstration, explanation and interpretation to engage students interest. The guideline will help to learn about South Asian fruit bats in an effective and memorable way. The activities will involve a game, identifying bats by comparison and by playing drama. The guideline also has general information about bats, myths about bats and drama ideas.

There are so many uses for the posters, not the least of which would be to display them on a wall or bulletin board, or use them for memorising the names and features of fruit bats

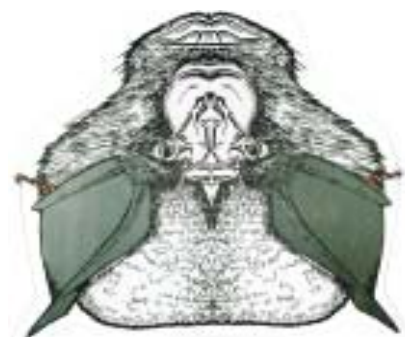
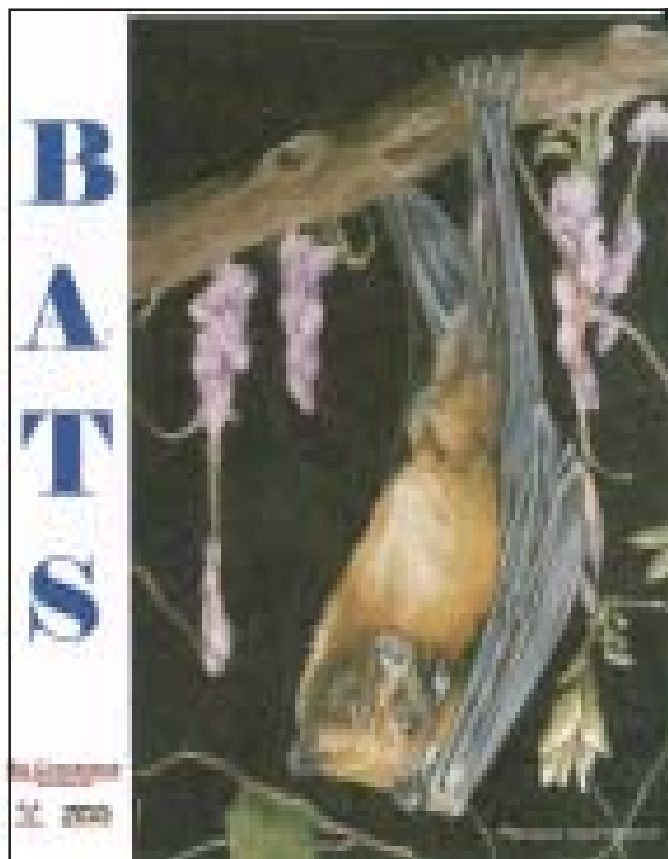
Thanks to BCI for funding the "poster(s)" and for being tolerant of the change.

Threatened Taxa Monitoring System also benefits from poster project

ttms or threatened taxa monitoring system is a website devoted to South Asian threatened taxa. Now the bats are benefitting from the drawings and photos collected for the poster as we are putting them up on the ttms website one by one. You can access this useful tool by going to the world wide web www.southasiantaxa.org this website is devoted to showcasing output from CAMP workshops held for South Asian Taxa.



Packet items



New packet

Our new packet has been redesigned with a colour cover, new bat masks, revised folder which is more handy and attractive, a colour placard for teaching kids to be good activists for bats, a colour rakhi, a cute bookmark with a 3-D bat and a small BACtivities booklet filled with activities.



Teachers use the various guidelines to utilise this packet as is or use it to reinforce other activities which they are doing now with the Bat Colouring book, BACtivities, the poster packet, ect.

The URL's below will take you to the colour version of these items for education.



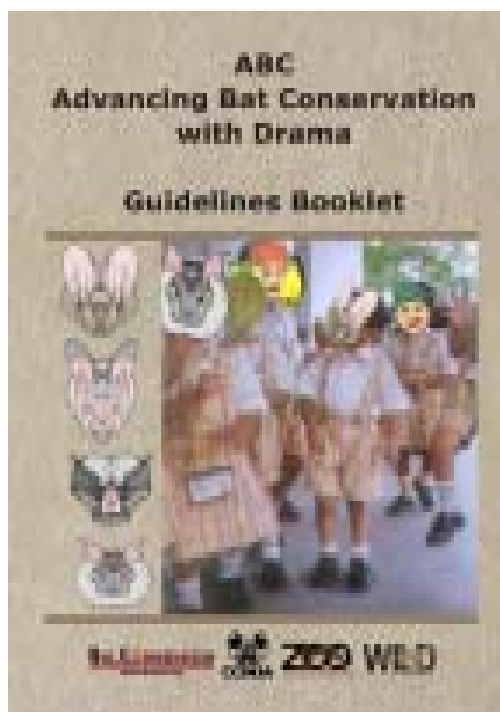
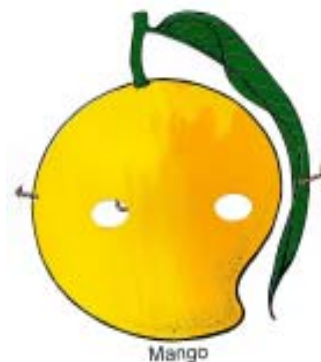
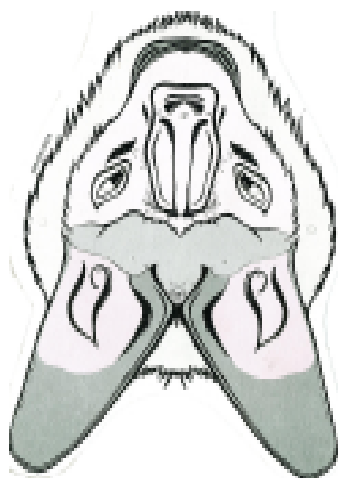
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http://www.zooreach.org/Networks/Chiroptera/SA_Bats_Colouring_Book_08.pdf
http://www.zooreach.org/Networks/Chiroptera/Photogallery/photo00007256/Fruit_bat_poster.htm



Drama Kit

Our Drama Kit contains helpful props to make your attempts at drama for learning more meaningful.

The masks displayed are only a few which come in the kit. Why a man ... a forester? ... well because man is both a saviour and a scourge to bats. Some people help them (like us) and some want to kill them, or at least drive them away. That makes a good theme for a drama ... "saviours and scourges of bats." What about that mango ! what's it to do with a drama. Well, bats eat mangoes sometimes (only ripe, unmarketable mangoes) so the mango would definitely have something to say ! There are other people and fruit masks in the drama kit as well as thematic ideas, etc. The moth is for insect bats !



This booklet of educational guidelines with specific application to bats will be useful in all aspects of programme development, including organisation, writing press release, planning programmes and implementing them in a creative manner. There are games, drama ideas, and many other helpful sections. Can be ordered separately and also via the internet as a PDF.

South Asian Bat Photo Project -- Progress Report and further requests

Last two years or more in Bat Net Newsletter we made a request for bat photos for the use of our various network projects. We want photos for each South Asian species to have them drawn in different versions for different works, such as education, TTMS, pterocount and just for record.

This year we completed fruit bats and you can see the product in a report on the poster in this issue of Bat Net. We appealed for insectivorous bats also and got quite a few photos but we have a long way to go. Remaining is in the column to the right.

ZOO/CCINSA is in the process of illustrating our Threatened Taxa Monitoring System (TTMS) website dedicated to promoting and documenting threatened taxa of this region. Basic information such as what goes in a CAMP taxon data sheet illustrated with high quality illustrations and/or photographs of all bats will be a useful resource for South Asian fruit baters. We want colour illustrations painted from photographs for the sake of consistency.

This is a formidable task. For fruit bats, we managed to collect all but one "*Sphaerias blanfordi* (Thomas, 1891). Our artist, Arnab Roy of Kolkata, has completed the 12 fruit bats for which we had photos and is working on insect bats.

The lists in the next column are what we need. We would like to obtain photographs of both endemic and non-endemic insectivorous bats. If you have photos of any of these, kindly send one low resolution version of each one you would like to be considered to our email <zooreach@zooreach.org>. We will study the photo and decide whether it is appropriate for our project. Then we will ask you to send the high resolution photographs by email or CD. We will discuss remuneration on a case-by-case basis.

Bat photos needed:

Endemic species

1. *Eptesicus tatei*
2. *Hipposideros durgadasi*
3. *Hipposideros hypophyllus*
4. *Murina grisea*
5. *Myotis csorbai*
6. *Myotis sicarius*
7. *Scotozous dormeri*
(= *Pipistrellus dormeri*)
8. *Rhinolophus mitratus*
9. *Scotoecus pallidus*

Non-endemic species

10. *Areilulus circumdatus*
(= *Pipistrellus circumdatus*)
11. *Asellia tridens*
12. *Barbastella leucomelas*
13. *Chaerephon plicatus*
14. *Coelops frithii*
15. *Eptesicus bottae*
16. *Eptesicus gobiensis*
17. *Eptesicus nasutus*
18. *Eptesicus pachyotis*
19. *Eptesicus serotinus*
20. *Falsistrellus affinis*
(= *Pipistrellus affinis*)
21. *Harpiocephalus harpia*
22. *Harpiocephalus mordax*
23. *Hipposideros cineraceus*
24. *Hipposideros larvatus*
25. *Hypsugo cadornae*
(= *Pipistrellus cadornae*)
26. *Hypsugo savii*
(= *Pipistrellus savii*)
27. *Ia io*
28. *Kerivoula tenuis*
29. *Kerivoula hardwickii*
30. *Kerivoula picta*
31. *Megaderma lyra*
32. *Miniopterus schreibersii*
33. *Murina aurata*
34. *Murina huttonii*
35. *Murina leucogaster*
36. *Murina tubinaris*
37. *Myotis annectans*
38. *Myotis blythii*
39. *Myotis formosus*
40. *Myotis hasseltii*
41. *Myotis horsfieldii*
42. *Myotis longipes*
43. *Myotis montivagus*
44. *Myotis siligorensis*
45. *Nyctalus leisler*
46. *Nyctalus noctula*
47. *Otomops wroughtoni*
48. *Otonycteris hemprichii*

49. *Pipistrellus abramus*
50. *Pipistrellus coromandra*
51. *Pipistrellus paterculus*
52. *Pipistrellus pipistrellus*
53. *Plecotus auritus*
54. *Plecotus austriacus*
55. *Rhinolophus blasii*
56. *Rhinolophus lepidus*
57. *Rhinolophus luctus*
58. *Rhinolophus macrotis*
59. *Rhinolophus pearsonii*
60. *Rhinolophus pusillus*
61. *Rhinolophus rouxii*
62. *Rhinolophus sinicus*
63. *Rhinolophus subbadius*
64. *Rhinolophus trifolius*
65. *Rhinolophus yunnanensis*
66. *Rhinopoma hardwickii*
67. *Rhinopoma muscatellum*
68. *Scotomanes ornatus*
69. *Scotophilus kuhlii*
70. *Tadarida aegyptiaca*
71. *Tadarida plicata*
72. *Taphozous longimanus*
73. *Taphozous melanopogon*
74. *Taphozous nudiventris*
75. *Taphozous theobaldi*
76. *Triaenops persicus*
77. *Tylonycteris pachypus*
78. *Vespertilio murinus*



BAT NET & CCINSA

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

Sripathi Kandula: Chair
Sally Walker: Convenor and Administrator
Sanjay Molur: Red List and Technical Expert
R. Marimuthu: Research Assistant and Education Officer

BAT NET is the bi-annual Newsletter of the Chiroptera Conservation and Information Network of South Asia (CCINSA) and CSG activities in South Asia

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International Partners of CCINSA

Bat Conservation International BCI has invited ZOO/CCINSA into a trial three year partnership to conduct public education, field training and conservation workshops and network baters both potential and actual on behalf of BCI in this region. BCI is one of the most active, innovative and respected bat conservation organisations in the world.

See BCI's wonderful website: www.batcon.org



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



IUCN SSC Chiroptera Specialist Group

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

CSG

CCINSA is an activity of Zoo Outreach Organisation (ZOO) and Wildlife Information Liaison Development (WILD) in association with CBSG, South Asia and RSG, South Asia.



Note: ZOOS' PRINT Magazine, Journal, Newsletters and a variety of reports can be found on our websites: www.zooreach.org and www.zoosprint.org.