

## Project Update: January 2008

A large-scale camera trapping survey was carried out in the 1,985 km<sup>2</sup> Namdapha National Park between October 2006 and January 2007. Our intensive study area of 1200 km<sup>2</sup> encompassed the moist evergreen forests below 2000 m of the park. A uniform grid of 9 km<sup>2</sup> was imposed on a map of the area. Of the 130 grids covering the study area, sampling was carried out between October 2006 and January 2007 in 40 of these grids covering 30% of the study area. We surveyed terrestrial mammal species using 42 passive infra-red camera trap units. A group of highly skilled *Lisu* trackers assisted throughout the 3 month survey and helped to identify suitable locations for deploying camera traps. The total camera trapping effort was over 1,600 trap nights. However, we used 1537 trap-days of data for analysis. Twenty-five species of mammals were recorded including 10 rare, endangered or little-known species (see table).

Eleven carnivore species (7 rare or little-known) were recorded through camera trapping including the Clouded leopard (*Neofelis nebulosa*), Malayan sun bear (*Helarctos malayanus*), Marbled cat (*Pardofelis marmorata*), Golden cat (*Catopuma temmincki*), Leopard cat (*Prionailurus bengalensis*), Crab-eating mongoose (*Herpestes urva*), Large Indian civet (*Viverra zibetha*), Himalayan palm civet (*Paguma larvata*), Common palm civet (*Paradoxurus hermaphroditus*) and Chinese or Small-toothed Ferret-badger (*Melogale moschata*) recorded. These are among the first photographic evidences of some of these species at Namdapha, while some have not been photographed in the wild before in India. Other rare or little-known species recorded included the Himalayan Crestless porcupine (*Hystrix brachyura*), the Brush-tailed porcupine (*Atherurus macrourus*) and the Stump-tailed macaque (*Macaca arctoides*). Seventeen bird species (including 2 pheasant and two partridge species) were also recorded on camera traps. Among ungulates, only 3 species were captured on camera traps, with barking deer (*Muntiacus muntjak*) being relatively more abundant than sambar (*Cervus unicolor*) or wild pig (*Sus scrofa*) which are present in very low numbers. In October-December 2007, we also recorded the rare hog-badger (*Arctonyx collaris*) and the red goral (*Nemorhaedus baileyi*) on camera traps. We obtained an average of 37 animal pictures per 100 days of trapping effort or 23 mammal pictures per 100 days in Namdapha. Barking deer was the most abundant based on camera trapping records in Namdapha.

Pilot surveys in Namdapha from 2004-2005 and prior work suggested that standard methods for density estimation of ungulate species could not be used because of poor detectability and low abundance of ungulates. We therefore chose the occupancy framework for generating baselines of ungulate species that are targeted by hunting for long-term monitoring of changes in occupancy of ungulates in response to reduction in hunting pressures. Pellet and track surveys were carried out in 38 grids to establish baseline estimates of occupancy for future comparisons. In addition, covariate data on habitat and disturbance variables were also collected in all grids. A total of 387 plots were intensively searched by two observers for indirect signs (pellets and tracks) of elephants and ungulates (barking deer, gaur, serow, sambar, wild pig). The pellet and track survey results also established very low abundance of ungulates in Namdapha. Only 35 pellet groups were detected in 22 of 387 plots. While barking deer tracks were detected in 100% of the sampled grids, sambar tracks were detected in 81% of grids, Wild pig in 50% of grids, gaur in 18% of grids and serow in 5% of grids. Occupancy estimates were high for Indian muntjac *Muntiacus muntjak* (1) and sambar *Cervus unicolor* (0.8) and they appeared to be unaffected by disturbance. Occupancy estimates of gaur *Bos gaurus* (0.24) and wild pig *Sus scrofa* (0.45) were low and they were negatively affected by disturbance. Results indicate that even occupancy models may have limited applicability in tracking positive changes in the status of species (such as sambar and barking deer) that are not abundant, yet are widespread.

Analysis of satellite imageries of the park to understand changes in forest cover is underway through collaboration with a remote sensing expert. We have used data from over 700 GPS locations to enable habitat classification. We are initially comparing changes in forest cover due to clearing and degradation by settlements in the park between 1997 and 2006. We obtained images from the area (23 m resolution) for 1999 (soon after settlements came up) and 2005 (current) and initial analysis of these two images is complete. The park area was classified into 11 habitat or land cover types (dense tropical forest, subtropical and temperate forest (1800 – 3000 m), sub-alpine, alpine and snow-covered areas (> 3000 m), bamboo forest, grassland, open forest, human-degraded forest, settlements and cultivation, exposed landslides, waterbodies and riverbed). There has been an increase in area under settlements and cultivation (about 4 km<sup>2</sup>), human-degraded forest and open forest (ca. 30 km<sup>2</sup>) in the park from 1999 to 2005 and corresponding decrease in dense tropical forest below 1000 m. The results of this study is being now being written up as a scientific paper and will be communicated to park and state forest authorities to highlight the urgent need to arrest further degradation of forests in the park. People involved in this study include Dr. Harini Nagendra & Somajita Paul, ATREE, Bangalore.

**Table 1. Number of photos and Relative Abundance indices for species recorded on camera traps in Namdapha NP between October 2006-January 2007.**

Species	Total photos	Independent photos	RAI <sub>1</sub>	RAI <sub>2</sub>
Stump-tailed macaque <i>Macaca arctoides</i>	40	40	38	2.60
Capped langur <i>Trachypithecus pileatus</i>	2	1	1537	0.06
Sambar <i>Cervus unicolor</i>	3	3	512	0.19
Muntjacs <i>Muntiacus muntjak &amp; M. crinifrons?</i>	121	71	22	4.62
Wild pig <i>Sus scrofa</i>	7	3	512	0.19
Malayan Sun bear <i>Helarctos malayanus</i>	3	1	1537	0.06
Clouded leopard <i>Neofelis nebulosa</i>	2	2	768	0.13
Marbled cat <i>Pardofelis marmoratra</i>	2	2	768	0.13
Golden cat <i>Catopuma temmincki</i>	4	4	384	0.26
Leopard cat <i>Prionailurus bengalensis</i>	11	6	256	0.39
Ferret badger <i>Melogale sp.</i>	5	4	384	0.26
Yellow-throated marten <i>Martes flavigula</i>	10	5	307	0.32
Large Indian civet <i>Viverra zibetha</i>	12	11	140	0.72
Common palm civet <i>Paradoxurus hermaphroditus</i>	11	4	384	0.26
Himalayan palm civet <i>Paguma larvata</i>	5	5	307	0.32

Crab-eating mongoose <i>Herpestes urva</i>	4	2	768	0.13
White-tailed mole <i>Parascaptor leucura</i>	1	1	1537	0.06
Asiatic brush-tailed porcupine <i>Atherus macrourus</i>	23	17	90	1.11
Himalayan crestless porcupine <i>Hystrix brachyura</i>	29	21	73	1.37
Squirrels <i>Dremomys sp. &amp; Calloscirus sp.</i>	3	3	512	0.19
Malay tree shrew <i>Tupaia belangeri</i>	1	1	1537	0.06
Rats	40	20	77	1.3
Unknown mammals	4	4	384	0.26
Kalij pheasant <i>Lophura leucomelanos</i>	57	25	27	3.71
Grey peacock pheasant <i>Polyplectron bicalcartum</i>	29	11	53	1.89

RAI1: Number of days required to get single photo capture, RAI2: Number of photos per 100 trap-days