Project Update: September 2006

Status Report of the Rufford Small Grant Project:
An application of information technology in wildlife studies – fauna and their habitat usage survey through inexpensive digital camera traps in Bandipur Tiger Reserve, southern India, run by Nityata Foundation

Introduction
The project aimed at assessing the suitability of indigenously developed camera traps for various studies of the fauna in the Bandipur Tiger Reserve of South India.

Following are the specific objectives of this study (considering time and resource availability),

- Identifying usage pattern of water holes by different species of animals and developing a strategy for species-specific water hole management for specific seasons.

- Demonstrating the usage of camera traps in identifying different age and sex classes of elephants for population structure and dynamic studies of elephants. As BTR has a severe human – elephant conflict problem, identification of problem animals becomes important, making an attempt to document such animals through camera trap techniques worthwhile.

- Mapping the status (number, distribution) and habitat usage of small, rare, elusive and endangered animals using camera traps.

- Sharing the knowledge gained through the camera trap technique, with concern forest departments and local human communities who suffer through conflict issues, for a better understanding of the issues involved.

Implementation
As soon as the funds were granted to us as, early as June 2005, we started procuring sub-systems and manufacturing the required camera traps at CEDT. In parallel we approached the Karnataka Forest Department (KFD) for obtaining the required clearances. We were able to sign a Memorandum of Understanding (MoU) with the KFD on 11 October 2005, allowing us to carry out the field work for one year starting from 1 November 2005 till 31 October 2006 in the Bandipur Tiger Reserve, which covers an area of around 900 Sq. Km. with 10 administrative Ranges and falls within the Nilgiri Biosphere Reserve (NBR; 5540 sq. Km) spreading across three states of Tamil Nadu, Kerala, and Karnataka of Southern India.

In the first two months (November and December 2005), we sorted out the logistics problems and tested the methodology in the field. In consultation with the concerned officer of the KFD, we identified the following 6 ranges to be covered under the study: Gundre, Begur, Maddur, Moolehole, Bandipur and Moyar. This allows us to three broad zones with varied vegetation cover in the national park.

The actual methodical field work for data collection started in January 2006.

Logistics
Our field researcher is based in the Bandipur Tiger Reserve and works in close collaboration with the forest department. He has 15 locally developed digital camera trap systems and all required accessories at his disposal. He has also the required topo maps, a GPS, a laptop and a cellular phone with GPRS connection. He uses a small jeep for his field work and has two base camps to operate from. Both base camps have electricity as he needs to be able to recharge the systems batteries on regular basis.

During the first 8 months of project deployment, we have lost 10 camera trap systems, all destroyed by elephants. We were aware of this risk, but it turned out to be more serious than envisaged. However, we were able to replace the systems without disruption in field deployment.

Methodology

For the first three objectives (water hole utilization, elephant herd structure and small mammals) we carry out camera traps deployment in a cyclic manner as follows: out of the identified 6 ranges, one zone of two ranges is covered every month and the process is repeated in the same zone in a 3 month cycle. A total of up to 15 camera traps are deployed simultaneously in the zone under investigation in three phases:

- In the first phase of deployment camera traps are placed at strategic locations at five randomly selected waterholes in each zone for a period of 96 hours or 4 days to make the sampling pattern stable and comparable. The tracks and signs of various animals that visited the waterhole are recorded before the cameras are placed along with a vegetation assessment around the waterhole. After 96 hours, the cameras are removed and the tracks and signs of mammals that visited the waterhole are noted (to test the efficiency of the cameras).
- the second phase of deployment lasts also approximately 5 days and aims at obtaining pictures of elephant's herds to study their structure. Towards this the camera traps are positioned at suitable locations within the ranges under study. To be usable the systems should record adequate pictures so as to be able to identify the sex and age of most of the individuals in the herd.
- In the third phase of deployment, we try to obtain pictures of small elusive mammals. Towards this, the systems are positioned closer to the ground and dispersed over a wider area, trying to identify locations that are likely to be frequented by such mammals.

After completing these three successive deployments within a month, the team moves with the material to the next ranges and repeated the operation.

During each phase of deployment, the field researcher and his assistants always record the GPS location of each camera together with a brief descriptive of the surrounding in terms of vegetation, canopy cover, signs of animal presence, etc.

The fourth objective of the study, which relates to wildlife/human conflicts, is taken up on a case-to-case basis, on request from the forest department. It is in the form of technical support to their intervention towards conflict prevention or mitigation.

Data Collected

Data have been collected from January 2006 till now and the field work is going on. The pictures obtained during each deployment phases are systematically stored on computer and later processed, first classifying usable and unusable frames and also the species captured. Till date we have obtained 276 short videos of about 20 sec duration each and close to 15'100 pictures out of which about 6'300 have valid data. At this stage the pictures are classified as follows (please note that in some cases we may have a dozens of pictures of the same animal in a sequence):

Common name	**Number of pictures**
Tiger	51
Leopard	15
Dole (Asiatic wild dog)	108
Sloth Bear	13
Jungle cat	3
Civet cat	22
Mongoose	45
Elephants	2538

Gaur	876
Sambar	869
Chital	2180
Muntjac	4
Mouse deer	2
Bonnet macaque	1
Langur	143
Rodent	2
Hare	42
Porcupine	37
Jungle fowl	10
Peafowl	70
Vulture	304
Crow	3
Myna	21
Pigeon	2
Test shots	187
Cattle	285
People / vehicles	448

Data Processing

The data thus obtained shall be further processed in line with the various objectives of the study.

All data related to waterhole utilisation shall be analysed to establish the waterhole usage pattern by various species. This would include the time of visit, duration of visits and their seasonal variations. This analysis is yet to be carried out.

For the study of elephant heard structure, we will sort out all usable sequences of pictures that have captured the composition of a given herd. A detailed analysis of each picture in such sequences shall allow us to establish the herd structure in terms of age and sex of individuals. Some preliminary work has been done but the major analysis is still due.

For the study of small elusive mammals, we shall put together all pictures of such species and try to establish patterns based on time and location.

Recent Development

During the last month, we have been requested by the forest department for assistance in their effort at mitigation of a human / tiger conflict in the Nagarhole Tiger Reserve, adjacent to the Bandipur Tiger Reserve. Our team has spent 2 weeks there with all camera trap systems to help identify tiger movements on coffee estates bordering the reserve as there had been some cases of attack by a tiger. With 16 systems deployed for 15 days, we have been able to collect significant data in terms of tiger and leopard movements in this region.

Target for Project Completion

In order to have at least a full coverage of seasonal variations, we intend to carry out the field work till January 2007. As we had been operating only with one field researcher till now, we were not able to carry out the data processing at the required pace till now. We shall then spend another month after the field work is completed to analyse the data collected. We should therefore be able to produce a comprehensive report towards end of March 2007.