Some methods to study the small cats

Shomita Mukherjee

ONE OF THE MAIN reasons for studying the behaviour and ecology of rare and endangered animals is to find new and better ways to conserve them. Since habitat and food are two of the most important resources for animals, it follows that information on these need to be obtained for planning any management strategy. Based on such basic information more detailed studies can be then planned.

TO DETERMINE STATUS

The secretive, solitary and nocturnal habits of small cats make them very difficult to study. Obtaining direct sightings is not easy and so one has to largely rely on indirect evidences of their presence, such as tracks or scats (faeces). Since it is neither possible, nor necessary, to obtain total numbers for determining the status of a species, regular estimates and trends of use of a habitat by the species would suffice. This can be done by both direct and indirect means.

DIRECT METHODS : These rely on animal sightings, hence for felids that are nocturnal, the time for locating them should be around dusk, dawn and night. Methods for obtaining direct sightings can involve random walks, walks on trails and roads, and vehicle drives through the network of roads in the area. Data-sheet may be prepared, separately for foot and drive counts *(see Table I for example).*

It is important to note the approximate total distance travelled per search, as the abundance of species can be expressed as encounter rates per kilometre (*i.e.* sum up all sightings obtained of each species in each habitat and divide by the total distance travelled in that habitat). This data-sheet can be made separately for each month so as to obtain a pattern

Table I
Foot counts for the month of August 1998

Date & Time of sighting	*Area (Habitat)*	*Species*	*Nos.*	*Activity*	*Total distance covered*	*Time spent in habitat*
120898 2000hr	Scrub. (kachha road)	Jungle cat	1	Walking	2 km	2.5 hrs 1900-2130hr
130898 2200hr	Wetland. (main road)	Fishing cat	2	Resting	3 km	2.5 hrs 2100-2330hr
130898 2300hr	Wetland (main road)	Jungle cat	1	Walking		

of habitat use through the year. The search effort timings - night and day - can give the time of activity in the various habitats which can be compared and correlated to several other factors e.g. disturbance from human activity, presence of other carnivores, prey habits, etc. All other information such as number of kittens (if any), their approximate age, etc. should also be noted.

INDIRECT METHODS : Several evidences left behind by an animal can be used for estimating its relative abundance.

Scat counts - As with direct sightings, special efforts can be made to locate scats (droppings) of animals along main and dirt roads. Data-sheets can be prepared to record area, distance travelled and number of scats found, of each species, in that habitat. The total number of scats located divided by distance travelled will give encounter rates for scats of each species in different habitats, which can be compared. One way of avoiding recounting scats is to walk any trail or road just once and record locations of scats along it without collecting them.

Scats can provide information on the food habits of the species. But, as scats are used for marking territories and as means of communication between individuals of a species, there is a possibility that collecting all scats may disturb the animals. As such, there should be only limited collection which can be done for a month in each season over a period of one year and repeated on alternate years. However, one major problem with this method lies in the identification of scats of different carnivores, particularly in areas which have a large number of similar sized and related carnivores such as in north-east India.

Track counts - Tracks of animals, monitored systematically over a long period in different habitats can give substantial information on use of a habitat by a particular species. Tracks can be obtained on patches of area cleared of vegetation, over which a thin layer of soft soil is sprinkled. Many such plots can be laid in a habitat, spaced out at regular intervals (e.g. 500m.). These plots can be laid adjacent to dirt tracts and animal trails as well as away from these. This method is more feasible in the drier areas with plenty of loose soft soil, although several modifications may be made for other areas, e.g. using metal sheets with a fine layer of carbon collected by smoking it over a candle. These sheets can be placed as track plots at regular intervals in various habitats.

Other area specific methods can be designed to minimize problems specific to the area. The location of these plots may be permanent or changed regularly. Data should be recorded every morning and the track plots set up again. However, since animals take some time to adjust to any new feature in their surroundings, the first few days after plots are set up may not yield results. Results of track plots are expressed as percentage visitation to plots in a habitat by a species:

$$\frac{\text{Number of plots with signs}}{\text{Total number of plots}} \times 100 .$$

If an area has more than one species of similar sized cat, their tracks would be difficult to distinguish and there would be a problem of evaluating relative abundance through tracks. In such a case, the results can be interpreted for small cats as a group i.e. areas of high cat use can be identified. Of course, this would give much less information but it would still be valuable for conservation purposes.

One way to get around the problem

Rules & Precautions

* Take due permission of the forest department before collecting anything from field or prior to any trapping exercise.

* Wear gloves for collecting scats to prevent transmission of dangerous parasites present in scats

* Wear gloves and mask over mouth and nostrils while analyzing scats; or while handling rodents as some dangerous viral diseases can be transmitted through them.

* Laboratories or rooms where scats are analyzed should be well ventilated.

* Prevent rodent faeces and urine from touching any part of your body.

of track identification is to use camera traps (a camera attached to a pressure pad or an infra-red device which triggers the camera as the animal steps on the pressure pad or moves across the infra-red beam. In effect, the animal photographs itself!).

These traps may be placed around areas and on paths that are intensively used by cats (*i.e.* areas where track plots show lots of cat tracks). The photograph will reveal the identity of the cat species and the measurements of the tracks may show differences (if there are any) with other cat tracks. However, this will be possible over a longer time period when a range of track measurements can be obtained for different species in that area.

One important factor to be noted is that "status" is a relative term, hence if a cat e.g. Jungle cat, is recorded as common in an area, this should be relative to other areas where the cat is found or to other cats found in that area, and must be stated as such. Without a systematic approach to obtain relative abundance, conclusions on status can be erroneous. Loose usage of such terms can cause damage to the species concerned.

It is advisable to use both, direct and indirect methods for more reliable conclusions.

TO STUDY CAT FOOD HABITS

As mentioned earlier, from direct observations of cats, only anecdotal records can be obtained after much effort which is not enough to describe the food habits of a species. Hence indirect methods have to be used to get reliable estimates of their diet.

Since scats contain all the undigested remains, these can give valuable information on the diet of predators. The scats should be teased apart and the remains of different groups of prey (mammals, birds, reptiles, invertebrates and vegetable matter) separated. Most mammalian remains can be identified to the species level by examination of hair and other remains such as jaws and dentition (usually of rodents or insectivores such as shrews).

The results can be interpreted as simple presence/absence of species, given as percentage of scats having a particular prey species or as biomass consumed. For the latter, an idea of the body weight of the prey as well as the number of individuals of that prey species consumed is necessary. Body weight of most rodents, shrews, reptiles and birds are available from literature. The keys for the identification of the prey remains (feathers for birds, scales for reptiles, mouth parts and other body parts for invertebrates) should be prepared whenever possible.

Rodents can be identified to the species level from their dentition, as the biomass calculations are applicable to this group alone. For this, however, it is necessary first to establish a checklist of the species present in the area and sacrifice a few rodents to obtain their jaws for dentition patterns. Once the dentition found in scats are identified and the number of whole jaws counted, biomass of each rodent species consumed can be obtained by simply multiplying the number of individuals of that species eaten with its average body mass.

A comparison of diets of various carnivores can be made only if scats are properly identified. However, even if scats of all small carnivores in an area are pooled, valuable information on the diet of this community as a whole can be obtained. Diet can be

compared over seasons and different habitats. Such information is not available for most places in India and would be very useful for future studies and conservation of small carnivores.

Knowledge of availability of prey species in different habitats within an area can be compared to consumption. This would refine a study by giving probable reasons for diet changes (if any) between seasons and habitats as well as an idea of the preferred prey.

TO DETERMINE PREY ABUNDANCE

Since the prey species of the small carnivores belong to several groups (mammals, ground birds, other birds, reptiles, invertebrates), more than one method is usually required to cover all these. An initial pilot study of scats in each season can give an idea of the main food species for that period, and abundance estimates can be restricted to those groups in case time is a constraint.

For mammals such as hare, and ground birds such as peafowl, partridges and quails, track plots used for monitoring predator abundance can be used for prey as well. For rodents, standard methods are available which make use of live-traps. Several such traps (100-200) baited with some food (preferably peanut butter) can be set up in each habitat in a grid, with each trap at a fixed interval from the next (10m or as desired). e.g.:

Traps should be left in the place for a minimum of 3-4 days and nights. They should be shut for the day to avoid capture of birds and other unwanted species or should be checked regularly at 5-6 hourly intervals during the day (especially during summer) to avoid unnecessary death of captured animals. Baits should be renewed every evening and night. Total trap nights would be the total number of traps multiplied by the number of days. Hence if there are 100 traps in a grid kept for 5 days/nights then the total trap effort would be 500 trap days/nights. Results can be interpreted as percent trapping success of a species in a habitat *i.e.*

$$\frac{\text{Number of catches made} \times 100}{\text{Trap effort}}$$

Food consumed can then be compared to availability in each habitat and preferences, if any, obtained.

Selected readings

CAPURRO, A.F., A.J. NOVARO, A. TRAVAINI and M.S. ROMERO (1997) - Improved bile acid thin layer chromatography to identify faeces of neotropical carnivores. *J.Wildl.Manage.* 61:1424-1427.

CRAWLEY, M. (Ed) (1992) - Nocturnal enemies : The population biology of predators, parasites and diseases. *Blackwell Scientific Publishers, London.*

GRIFFITHS, D. (1975) - Prey availability and the food of predators. *Ecology* 56:1209-1214.

JOHNSON, K.M. and C.R. BELDEN (1984) - Differentiation in mountain lion and bobcat scats. *J. Wildl.Manage*, 48:517-525.

PRAKASH, I. and P.K. Ghosh (Eds) (1992) - Rodents in Indian agriculture, Vol. I. *Jodhpur Scientific Publishers.*

REYNOLDS, J.C. and N.J. AEBISCHER (1991) - Comparison and quanitification of carnivore diet by faecal analysis: A critique with recommendations based on a study of fox (*Vulpes vulpes*). *Mammal Rev.* 21:97-122.

ROBERTO, T.J. (1997) - The mammals of Pakistan. *Ernest Benn Limited, London,* 316 pp.

ROUGHTON, R.D. and M.W. SWEENEY (1982) - Refinements in scent station methodology for assessing trends in carnivore populations. *J.Wildl.Manage.* 46:217-229.