

**THE DISTRIBUTION, ECOLOGY AND CONSERVATION OF SMALL
CARNIVORES IN THE NILGIRI BIOSPHERE
RESERVE, SOUTHERN INDIA**

FINAL REPORT
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Government of India**

FINAL REPORT

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SUMMARY

Species in a small carnivore community share a wide variety of food resources which include fruits, invertebrates, lower vertebrates, birds, and small mammals. This community in a locality is therefore a good indicator of biodiversity at ecosystem and species levels. It also has important ecosystem functions since species in this community are major dispersers of seeds and predators. The conservation and ecological studies of small carnivores have therefore attracted considerable attention in recent years. The advent of new technologies such radio-telemetry has, in the recent years, made ecological studies of this community feasible.

India has a rich assemblage of small carnivores belonging to the Families of Felidae (cats), Mustelidae (weasels, badgers, ratel and martens), Viverridae (civets and lingsangs), and Procyonidae (the red panda). Eastern Himalaya and the Western Ghats, the two biodiversity hotspots in India, are also major centres of species richness among the small carnivores. However, the rich assemblage of small carnivores in India has received very little conservation and research attention. It was in this context that this project, the first one on a small carnivore community in India, was initiated with the following objectives:

- To assess the distribution and abundance of small carnivores (four each of civets, mongooses, and lesser cats, and one species of marten) with reference to different habitat types and human disturbance;
- To assess the diet and habitat use pattern in some species; and
- To assess the conservation implications of the findings.

Nilgiri Biosphere Reserve was chosen as the study area since it has a full complement of the habitat types as well as the small carnivore community of the Western Ghats. The project began in October 1994. The first phase of the project, covering 24 months, was a survey of distribution and abundance of small carnivores in the Reserve. The second phase, covering 18 months, was an ecological study of a two species using radio-telemetry.

The distribution and abundance of small carnivores was assessed using scats or droppings as an indicator. The survey covered 10 areas, representing various altitudinal, vegetation and human disturbance regimes in the Reserve. Nearly 800 km were surveyed, mostly on foot, during which nearly 500 scats were collected. These could, however, be identified only up to Family level. The overall encounter rate of scats was 0.83/km, that of civets being the most abundant (0.47 scats/km), followed by mongoose (0.17), cats (0.14) and marten. The wet and semi-evergreen forests had the highest abundance of scats (2.78), primarily because of the abundance of civet scats (2.46). The montane shola-grasslands had the next highest abundance (1.29) owing to the abundance of marten scats (0.79) which were found only in this vegetation type. The dry thorn and scrub forests (0.36), dry and mixed deciduous forests (0.38) and moist deciduous forests (0.58) had considerably lower abundance of scats, those of mongoose being the most abundant. Cat scats occurred in all these vegetation types, being low in abundance as well as in its variation. Plantations, mostly of teak, had the lowest scat abundance (0.15).

The small carnivores also varied in their response to habitat degradation. Civet scats were least abundant in areas with low canopy cover and high weed cover, whereas that of mongoose

and cats were more abundant in moderately open canopy. Scats of these taxa were also highest in areas with lowest weed cover, however, the difference was not as large as in the case of civets.

It is very likely that there might be differences among species within the Family in their habitat preferences as well as response to disturbance. This could not be examined since only 18 animals were sighted during the survey. Our attempt to identify the scats up to species level, using thin layer chromatography (TLC) of bile acids from scats, was also not fruitful. Most of the animals of known species (small Indian civet, jungle cat and common Indian mongoose) had the same four bile acid components, and most of the bands had same or very close *rf* values. Colour intensity of the bands varied considerably. Thus, TLC was not found useful in identifying scats to species level.

Nearly 60% of the scats had fruit remnants, especially seeds, indicating the importance of small carnivores as seed dispersers. Seeds of nearly 20 species have been obtained from the scats. A major feature of these fruits was the high mesocarp to seed ratio, indicating that small carnivores might disperse seeds of a particular group of plants and thus play a major role in the vegetation dynamics of their habitat. Animal matter obtained from the scats included remnants of invertebrates (millipedes, beetles, crabs *etc.*), fish scales, and hair primarily of rodents.

Radio-telemetry studies were conducted in the dry deciduous and scrub forests of Anaikatti, near Coimbatore. Only one small Indian civet and two common Indian mongoose were trapped after nearly 400 trap days spread over 121 days, showing the low abundance of small carnivores and, perhaps, their trap shyness. These three animals were fitted with radio-transmitters, but only one each of small Indian civet and common Indian mongoose could be tracked for four months. The monthly home range of the small Indian civet varied considerably, from 20.69 ha in to 102 ha. The home range over the four months was 217.9 ha, thus showing very little overlap between monthly home ranges. The monthly and overall home ranges of the small Indian civet was lower than that of small Indian civet and the large Indian civet and for two species of palm civets reported from more moist forests of Thailand. This might be partly due to the fact the small Indian civet was tracked for only four months, compared to 7 to 12 months for other species.

The monthly home range of the mongoose varied only from 3.4 ha to 4.9 ha, with an overall home range of 15.5 ha. The only other telemetry study on mongoose of the same genus, the long-nosed mongoose (*Herpestes naso*) in Congo basin, has reported much larger home ranges of up to 47.5 ha. As in the case of the civet, one reason for the smaller home range was that the animal was radio-tracked only for four months. There was no overlap between monthly home ranges, the overall home range being considerably larger than monthly home ranges. The radio-telemetry studies on the small carnivores have given us the first estimates of home ranges of these species in India. The studies also highlight some of the major problems of such a study such as very low capture rates and short battery life.

Among the small carnivores in the Western Ghats, the Malabar civet is undoubtedly the most endangered. The only population definitely known to be surviving is most likely confined to private lands adjoining Karulai Range in Nilambur South Forest Division. Given the conservation status of the species and the threats faced by the only known population, we need to initiate a captive breeding programme with animals captured from this population. A study on habitat requirements of the species also needs to be made.