Canid News

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The following is the established format for referencing this article:
Vanak, A. T. 2005. Distribution and status of the Indian fox (*Vulpes bengalensis*) in southern India. Canid News 8.1 [online]
URL: http://www.canids.org/canidnews/8/Indian_fox_in_southern_India.pdf.

Field Report

Distribution and status of the Indian fox *Vulpes bengalensis* in southern India

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Keywords: distribution; Indian fox; Southern India; survey; *Vulpes bengalensis*.

Abstract

The Indian fox is reportedly the most widespread fox species known to occur in India. Despite this generalisation however, its distribution and status are virtually unknown. Although the Indian fox occurs in many protected areas in India, it has not been the focus of much research to date. A preliminary survey of sightings, pugmarks and dens was undertaken in seven districts of Andhra Pradesh and Karnataka states in southern India, to determine the distribution of the Indian fox. Its presence was confirmed in ten of the 13 sites surveyed, with the most number of sightings and signs of Indian fox presence found in Rollapadu Wildlife Sanctuary in Andhra Pradesh. The Indian fox appears to be sparsely but widely distributed within the localities surveyed.

Introduction

The Indian fox *Vulpes bengalensis* is endemic to the Indian subcontinent (Figure 1), one of two fox species recorded in this region (Menon 2003). Three subspecies of red fox also occur: desert fox *Vulpes vulpes pusilla*, Kashmir fox *V. v. griffithii* and Tibetan fox *V. v. montana*.

Figure 1. Indian fox, easily identified by characteristic black-tipped tail. © Abi Tamim Vanak

The Indian fox ranges from the foothills of the Himalayas to the southern tip of the Indian peninsula, found most frequently in dry open areas with low tree and shrub cover (Pocock 1936; Prater 1971; Johnsingh and Jhala 2004). Tolerant of human presence, they can be found in agricultural fields and the vicinity of rural habitation (Johnsingh 1978; Manakadan and Rahmani 2000; Vanak 2003; Johnsingh and Jhala 2004). Indian foxes are listed by IUCN as Least Concern (Sillero-Zubiri et al. 2004). In India they are listed under Schedule II of the Indian Wildlife (Protection) Act (Anon 2002) which affords a lower degree of protection.

Despite the occurrence of the Indian fox in many protected areas (PAs) of India, the species has not been the focus of targeted conservation efforts. Large fox populations are present in only a few PAs with extensive grasslands or scrub forest established for the protection of species such as the Great Indian bustard *Ardeotis nigriceps* and Indian blackbuck *Antilope cervicapra* (Karanth and Singh 1981; Manakadan and Rahmani 2000; Vanak 2003).

The Indian fox is opportunistic and has an omnivorous diet consisting of small mammals, reptiles, birds, insects and fruit (Johnsingh 1978; Manakadan and Rahmani 2000; Vanak 2003; Johnsingh and Jhala 2004). Studies of its behaviour and ecology are only preliminary to date, and basic knowledge is lacking. Detailed information on current distribution and population status is not available (Johnsingh and Jhala 2004). Further studies are therefore required to better understand the ecology of this species, which although not necessarily threatened, is under considerable pressure from human activities in parts of its range. A pilot survey was therefore undertaken of its distribution in parts of southern India, to identify regions where additional research is required.

Methods and Study Areas

Indian foxes were directly observed at dens or flushed out from day resting spots following Johnsingh (1978). This method worked best in grasslands or open scrub forest where visibility was good, especially during the summer months when grass and bush cover were sparse. In other areas, the help of farmers, shepherds and hunters was requested to locate possible den sites, which were subsequently inspected to ascertain whether they belonged to Indian foxes. Their dens, especially where they occur as underground burrows, are easily identifiable by their size and characteristic burrow holes and tunnels. Their position was mapped using a GPS. A vigil was kept at these areas during dusk for sighting opportunities. Droppings were often encountered near active dens and sometimes on trails and collected for dietary analysis (Vanak 2003). Trails, dirt roads and waterholes were searched for pugmarks likely to be those of the Indian fox, and measurements, photographs and plaster of Paris casts were taken wherever possible. Indian fox pugmarks were reliably identified from those of other canids such as the golden jackal *Canis aureus* and domestic dog, based on size and shape. Measurements of voucher specimens were obtained from pugmarks of foxes sighted at dens (mean length=41mm (SE=0.18, n=11), mean width=35mm (SE=0.14, n=11).

Spot lighting surveys were carried out at night from a motorcycle along existing roads within the survey areas, and an encounter rate index of sightings/km travelled was calculated. Two observers travelled on a motorcycle at a speed of 20-30 km/hr, scanning both sides of the road. Animals were identified with the help of a night vision device (Night Owl Optics, El Paso, Texas), binoculars and a powerful torchlight. GPS position, habitat type and terrain were recorded for each sighting.

Field work was carried out in five districts in Karnataka state and two districts in Andhra Pradesh state in southern India (Figure 2) as follows:

Chikballapur (Bangalore-Rural district, Karnataka) – A series of low rocky hills dominated by scrub and dry deciduous vegetation. A mosaic of cultivated and fallow fields, including vineyards, in the surrounding plains.

Sidlaghatta (Bangalore-Rural district, Karnataka) – Dominated by *Eucalyptus* plantations, sugarcane and mixed crop fields. Very little natural vegetation left; only areas where *Eucalyptus* plantations have been harvested resemble natural grasslands.

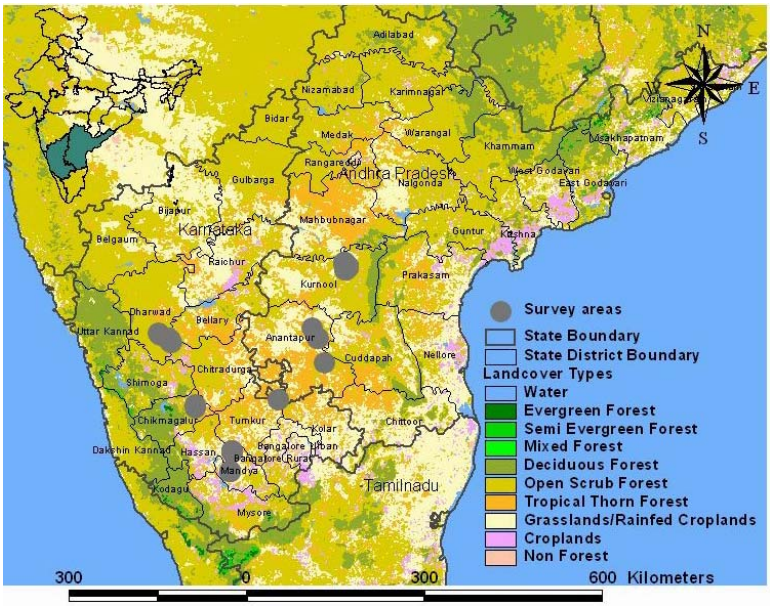

Figure 2. Map showing surveyed areas in Karnataka and Andhra Pradesh in southern India.

Mydenahalli (Tumkur district, Karnataka) – Protected reserved forest proposed as an Indian blackbuck sanctuary, consisting of flat grasslands and mixed plantations of *Eucalyptus* and *Acacia* set amidst agricultural fields.

Madhugiri and Pavagada (Tumkur district, Karnataka) – Similar in topography to Mydenahalli, flat to gently undulating with rocky outcrops and low hills dotting the landscape. The plains are mostly agricultural fields, with occasional patches of scrub, orchards, and gullies providing the only vegetation cover.

Melkote Wildlife Sanctuary (Mandya district, Karnataka) – A 50km² rocky and hilly wildlife sanctuary dominated by *Eucalyptus* and *Acacia* spp. plantations. Native vegetation consists of dry deciduous forest and dry scrub.

Yendahalli (Mandya district, Karnataka) - Southwest of Melkote Wildlife Sanctuary, dominated by agricultural fields, coconut plantations and sugar cane. Small rocky outcrops and hillocks dot the landscape.

Kadabahalli (Mandya district, Karnataka) – Off the Bangalore-Mangalore National Highway, a gently undulating matrix of scrub forest, agricultural fields and fallow lands.

Chik Basur and Basur Kaval (Chikmagalur district, Karnataka) – Flat to gently undulating area east of the town of Kadur, has two large blocks of grassland and scrub forest, with *Eucalyptus, Casuarina,* and *Acacia* spp.

Ranebennur Wildlife Sanctuary (Haveri district, Karnataka) – 119km² of gently undulating scrub forest and mixed *Eucalyptus* and *Acacia* plantations, created mainly to protect blackbuck. Two blocks of forest separated by cultivated lands and the town of Ranebennur.

Rollapadu Wildlife Sanctuary (Kurnool District, Andhra Pradesh) – In the plains between Yerramalai and Nallamalai hills of Andhra Pradesh (Figure 3), 6.1km² of undulating semi-arid short grassland established in 1988 for the protection of Great Indian bustard.

Figure 3. Semi-arid short grasslands of Rollapadu Wildlife Sanctuary, among the most endangered eco-systems in India. © Abi Tamim Vanak

Rollapadu (Kurnool district, Andhra Pradesh) – Village grazing lands and agricultural fields. Similar in vegetation, topography and fauna to wildlife sanctuary.

Bathalapalli (Anantapur district, Andhra Pradesh) – Broad gently undulating plain between two small hill ranges, primarily fallow agricultural land, with rocky outcrops.

Mutchukota (Anantapur district, Andhra Pradesh) – Similar in topography to Madhugiri-Pavagada, with flat to undulating areas and low bouldery hills. Dominated by agriculture, although protected reserved forests in the hills retain native vegetation. Also small patches of grasslands, scattered among almost pure stands of *Hardwickia* spp.

Results

The presence of Indian foxes was detected in ten of the 13 sites that were surveyed. Twenty-seven direct sightings, 77 dens and 25 sets of pugmarks were encountered, and 95 droppings collected during 246 man hours of field work and 782 km of road surveys (Table 1). Most direct sightings (n=25) and dens (n=56) were in the Rollapadu Wildlife Sanctuary and surrounding grasslands. Ten dens were found in the Ranebennur Wildlife Sanctuary. Signs of Indian fox presence were found in all other areas except the hills of Chikballapur and Melkote Wildlife Sanctuary, and in the *Eucalyptus* plantations of Sidlaghatta.

Survey location	**Effort** (Hours)	**Effort-Road Survey** (Km)	**Sightings**	**Dens**	**Pugmarks**	**Scats**
Bathalapalli	15	130	0	0	0	1
Chik Basur	15	47	0	2	2	0
Chikballapur	32	58	0	0	0	0
Kadabahalli	5	62	0	3	4	0
Madhugiri/Pavagada	21	147	1	0	0	2
Melkote	27	47	0	0	0	0
Mutchukota	14	45	0	0	2	2
Mydenahalli	8	24	1	0	3	2
Ranebennur	38	112	0	10	6	14
Rollapadu Sanctuary*	20	0	10	19	1	25
Rollapadu**	42	26	15	37	5	22
Sidlaghatta	6	84	0	0	0	0
Yendahalli	3	0	0	3	0	4

* Rollapadu Wildlife Sanctuary (6.1 km^2). ** Rollapadu – Area surrounding Rollapadu Wildlife Sanctuary

Table 1. Indian fox signs in surveyed areas in Southern India: a list of surveyed sites and the signs detected.

Discussion

Our results indicate that the Indian fox occurs sparsely in most areas of its range, reaching highest densities in grassland habitats such as Rollapadu in Andhra Pradesh. Manakadan and Rahmani (2000) estimated the population of Indian foxes in Rollapadu Wildlife Sanctuary at 40-50 individuals in 1993 and 1994, and observed an apparent crash in the population in 1995, down to ten individuals. Based on the number of direct sightings during this survey it is likely that the population of Indian foxes in Rollapadu has recovered to pre-1993 levels.

Karanth and Singh (1981) noted that the Indian fox was the most common carnivore in Ranebennur Wildlife Sanctuary, and direct sightings were a daily occurrence. During this survey, however, we did not sight a single fox, although other evidence was recorded. Possible reasons for this disparity in sightings may be due to the fact that in 1981 this area had been recently planted with *Eucalyptus.* The plantations are well established now, with a dense canopy and under-storey and this increase in cover might explain the lower detection rates. Alternatively, it may be possible that the habitat has undergone a fundamental change from an open scrub-grassland to a

more forested structure, and become less suitable for Indian foxes.

Human activities such as hunting and habitat destruction have been suggested as the cause for the low population density of Indian foxes over most of their range (Johnsingh 1978; Johnsingh and Jhala 2004). Villagers interviewed indicated that the Indian fox was locally hunted for its meat which is deemed to have medicinal properties, and captured for ritualistic ceremonies during religious festivals. This, combined with the increasing conversion of marginal land to agriculture and industrial use may be depressing Indian fox populations throughout much of their range (Johnsingh and Jhala 2004).

Manakadan and Rahmani (2000), the results of this survey and ongoing work (A. T. Vanak and M. Gompper, unpublished data) suggest that the Indian fox, although widespread in its distribution, may occur at high densities only in habitats such as the semi-arid grasslands of peninsular India. These highly endangered ecosystems are inadequately represented in the protected area network of India, and Vanak and IrfanUllah (2004) indicated that less than 2% of potential fox habitat falls within protected areas in southern India. Moreover, we have very little knowledge of the ecology and conservation status of this endemic species, its prey dynamics, and its vulnerability to disease outbreaks. Detailed studies are therefore required, since the species may be under considerable pressure from human activities.

Acknowledgements

This study was funded by Wildlife Conservation Society – India Programme Small Grant and supported by the Centre for Wildlife Studies, Bangalore. I thank the Chief Wildlife Wardens of Andhra Pradesh and Karnataka for permits and support, Dr. K.U. Karanth, S. Kumar, Dr. M. Irfanullah, S. Gubbi, V. Srinivas and D.V. Girish for technical and logistic support. I am grateful to A. Bhaskaran and Bopanna for enduring many back-breaking hours on the motorcycle.

References

Johnsingh, A.J.T. 1978. Some aspects of the ecology and behaviour of the Indian Fox *Vulpes bengalensis*. *Journal of the Bombay Natural History Society*, 75: 397-405.

Johnsingh, A.J.T. and Jhala, Y.V. 2004. Indian Fox. Pp. 219-222 in C. Sillero-Zubiri, M. Hoffman and D.W. Macdonald (Eds.), *Canids: Foxes, Wolves, Jackals and Dogs*. Status Survey and Conservation Action Plan. IUCN/SSC Canid Specialist Group, Oxford. [http://www.canids.org/species/Indian_fox.pdf]

Karanth, K.U. and Singh, M. 1981. Status survey report Ranebennur Blackbuck Sanctuary. WWF-India Southern regional office, Bangalore, India.

Manakadan, R. and Rahmani, A.R. 2002. Population and ecology of the Indian Fox *Vulpes bengalensis* at Rollapadu Wildlife Sanctuary, Andhra Pradesh, India. *Journal of the Bombay Natural History Society*, 97:3-14.

Menon, V. 2003. *A field guide to Indian Mammals*. Dorling Kindersley, Delhi, India. pp: 81.

Pocock, R.I. 1936. The foxes of British India. *Journal of the Bombay Natural History Society*, 39:36-57.

Prater, S.H. 1971. *The Book of Indian Mammals*. Bombay Natural History Society, Mumbai, India.

Sillero-Zubiri, C., Hoffman, M. and Macdonald, D.W. (Eds.) 2004. *Canids: Foxes, Wolves, Jackals and Dogs*. Status Survey and Conservation Action Plan. IUCN/SSC Canid Specialist Group, Oxford. [http://www.canids.org/cap/]

Vanak, A.T. 2003. Preliminary survey of Indian fox *Vulpes bengalensis* distribution in southern India. Wildlife Conservation Society-India Programme, Bangalore, India.

Vanak, A.T. and IrfanUllah, M. 2004. Predicting Indian fox distribution using ecological niche modelling. *Poster presentation- Defenders of Wildlife Carnivores 2004 Conference, Santa Fe, NM, USA*.

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