
**Impact of local hunting on abundance of large mammals in three
protected areas of the Western Ghats, Karnataka**



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Submitted to Rufford Maurice Laing
Foundation, UK
July 2006



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The Western Ghats and Hunting

The Western Ghats hill ranges harbours many endemic and threatened species of large mammals. Although many parks have been notified for their protection, they continue to face serious threats; local hunting being the one most important. Hunting has existed in the Western Ghats since historical times (Chandran, 1997), and it continues to persist (Madhusudan and Karanth, 2002; Kumara and Singh, 2004a) undermining all conservation efforts. Local hunting is carried by a large number of people, and it targets a wide variety of species. The biological impacts of hunting are poorly understood (Madhusudan and Karanth, 2002). We found that due to various reasons, no information was available with the forest officials on occurrence and status of any mammals in most of the protected areas of the Western Ghats, and they were unaware of the pressure created by local hunting. With this background we attempted to establish baseline data on mammals and the effect of hunting on them, in three parks.

Project Initiation and People Participation

The study was initiated during the January 2006, with the official approval by the Karnataka forest department. Mohan Kumar and Shanthala Kumar were appointed as research assistants in the project. Since the forest department and the parks managers supported the fieldwork by providing the free accommodation, and participated in the field surveys, further they also supplied the official documents and the information for the project. And during the different phase of the fieldwork, we also trained fifteen local NGO people to understand the surveys, through that understand the local biodiversity. Since researcher alone can not do the active conservation, this type of training and revealing the data to local people will help in future conservation activity, and to develop awareness among local people. They also participated in the survey of mammals.

The Study Sites

The details of the different study sites are provided in the Table 1. All the three protected areas are in the Western Ghats with mainly rainforest. Talakaveri WS and Pushpagiri WS are located in the southern parts of the Western Ghats in the state where the Sharavathi Valley WS is located at middle.

Table 1. General features of the three protected areas

Protected Area	Lat-Long	Area	Altitude Min-max	Temperature Min-max	Mean Annual Rainfall
Talakaveri Wildlife Sanctuary (TWS)	12°17'14"-12°26'38"N, 75°25'23"-75°33'15"E	105 km ²	63-1659m	15°-35°C	2000mm
Pushpagiri Wildlife Sanctuary (PWS)	12°29'16"-12°42'02"N, 75°37'59"-75°42'37"E	102km ²	60-1712m	10°-38°C	2000mm
Sharavathi Valley Wildlife Sanctuary (SVWS)	13°54'10"-14°16'31"N, 74°38'32"-74°59'45"E	431km ²	300-1102m	8°-33°C	3700mm

Table 2. The mammals expected to occur in the three study sites based on nominal distribution of the species (except species belongs to order Chiroptera and small rodents)

Order	Family	Scientific name	Common name	Red list status*
Primates	Loridae	<i>Loris lydekkerianus</i>	Slender Loris	VU
	Cercopithecidae	<i>Macaca radiata</i>	Bonnet Macaque	
<i>Macaca silenus</i>		Lion-tailed macaque	EN	
<i>Semnopithecus entellus</i>		Hanuman Langur	LR:nt	
Carnivora	Felidae	<i>Felis chaus</i>	Jungle Cat	
		<i>Prionailurus bengalensis</i>	Leopard Cat	
		<i>Panthera pardus</i>	Leopard	
		<i>Panthera tigris</i>	Tiger	EN
	Canidae	<i>Canis aureus</i>	Golden Jackal	
		<i>Canis alpinus</i>	Indian Wild Dog	VU
	Viverridae	<i>Viverra civettina</i>	Malabar Civet	CR
		<i>Viverricula indica</i>	Small Indian Civet	
		<i>Paradoxurus hermaphroditus</i>	Common Palm Civet	
		<i>Paradoxurus jerdoni</i>	Brown Palm Civet	VU
	Herpestidae	<i>Herpestes brachyurus</i>	Brown Mongoose	DD
		<i>Herpestes edwardsii</i>	Grey Mongoose	
		<i>Herpestes vitticollis</i>	Stripe-necked Mongoose	
	Mustelidae	<i>Amblonyx cinereus</i>	Oriental small-clawed Otter	
		<i>Lutra lutra</i>	Common Otter	
		<i>Lutrogale perspicillata</i>	Smooth-coated Otter	
		<i>Martes gwatkinsi</i>	Nilgiri Marten	VU
	Ursidae	<i>Melursus ursinus</i>	Sloth Bear	VU
	Hyaenidae	<i>Hyaena hyaena</i>	Striped Hyaena	
Rodentia	Scuridae	<i>Ratufa indica</i>	Indian Giant Squirrel	VU
		<i>Petaurista philippensis</i>	Giant Flying Squirrel	LR:nt
		<i>Petinomys fuscocapillus</i>	Travancore Flying Squirrel	VU
		Hystricidae	<i>Hystrix indica</i>	Indian Porcupine
Pholidota	Manidae	<i>Manis crassicaudata</i>	Indian Pangolin	LR:nt
Lagomorpha	Leporidae	<i>Lepus nigricollis</i>	Indian Hare	
Proboscidea	Elephantidae	<i>Elephas maximus</i>	Asian Elephant	EN
Artiodactyla	Suidae	<i>Sus scrofa</i>	Wild Pig	
	Tragulidae	<i>Moschiola meminna</i>	Indian Chevrotain	
	Cervidae	<i>Axis axis</i>	Spotted Deer	
		<i>Cervus unicolor</i>	Sambar	
<i>Muntiacus muntjak</i>		Indian Muntjac		
	Bovidae	<i>Bos gaurus</i>	Gaur	VU

*CR: Critically endangered; EN: Endangered; VU: Vulnerable; LR:nt: Lower risk near threatened; DD: Data deficient

Mammal Species

Considering the nominal distribution based on Prater, (1986) and other literature around 36 species of mammals were expected in the study sites (Table 2). Among them 13 species are listed in globally threatened species, i.e. One species is critically endangered, and three species are endangered, eight species are vulnerable and one species is listed as data deficient. In the rainforest the important species communities are arboreal species and small carnivore species,

hence during the survey we paid more attention to them. Among the arboreal species the most endangered species is lion-tailed macaque, and others are slender loris and flying squirrels. We also surveyed adjacent forest ranges to the study sites for the lion-tailed macaque.

Methods

To assess the mammal abundance, the existing trails were walked repeatedly both during the day and night. Recently in Sharavathi Valley WS forest department has established the line transect to calculate the herbivore occurrence and abundance as a national program. Since no attempt has been made by any researchers to calculate the density in the rainforests of Western Ghats, we used the same transect lines to estimate the density of mammals. Since lion-tailed macaques live in low density, the regular line transect method do not give any result, we adopted the sweep sampling or overall group count method to know how many groups are in the given area. Many local hunters and villagers were informally interviewed to understand their life style, hunting practice, agriculture, their interaction with the forest etc. Many attempts were made to live in the local village and understand them, and also collected the information on above aspects.

Results

Among 36 species listed, only the occurrence of 26 species confirmed in TWS, 16 species in PWS and 27 species in SVWS (Table 3). However the occurrence of species differed between the three sanctuaries. We had direct sighting of 19 species, and others are recorded with the other secondary evidences. The existence of lion-tailed macaque is confirmed in TWS and SVWS, and Nilgiri marten only at TWS. First time the sighting of Travancore flying squirrel is recorded from the PWS and SVWS. We discovered the large viable population of Malabar slender loris in SVWS. Usually sighting of Tiger in rainforests of Western Ghats are very rare, we had two sightings of tiger in SVWS, and which confirms the still existence of the species in the rainforests.



Around 24 species are hunted with various reasons like meat for local consumption, crop damage, depredation on livestock, poultry and honey, medicinal value and some of the species are considered as bad omen, however the major hunting motivation was for meat. All deer's and pigs are mainly hunted for meat, however primates are hunted in the name of medicinal value. They think that the black monkeys especially the lion-tailed macaques eat lots of vegetative materials from the higher canopy and as a result the meathas medicinal value and are indiscriminately hunted. Local people based on animal behavior, size of the animal, food habits, etc. the hunting technique will be adopted and also designed verity of traps and snares. Traps were more in croplands and at adjacent to protected areas. If large carnivore species are found regularly preying on livestock, usually in such situations the poison would be poured on such livestock carcass and kill the predator.

Table 3. The occurrence of mammals and other hunting aspects in three study sites

Common name	Occurrence of mammals*			Evidence ^{\$}	Hunting Motivation [@]	Main Hunting Technique ^{&}
	TWS	PWS	SVWS			
Slender Loris	+	+	+	1	f	B
Bonnet Macaque	+	+	+	1	a, b	A, C
Lion-tailed macaque	+	-	+	1	a, c	C
Hanuman Langur	+	-	+	1	a, c	C, D
Jungle Cat	?	?	+	6		
Leopard Cat	+	?	+	1, 6	g	C
Leopard	+	?	+	2, 5, 6	d	E
Tiger	+	?	+	1, 2, 6	d	E
Golden Jackal	+	+	+	2, 6		
Indian Wild Dog	+	+	+	2, 6		
Small Indian Civet	+	?	+	6	a, c	C, F
Common Palm Civet	+	?	?	6	a, g	C, F
Brown Palm Civet	+	+	+	1, 2, 6	a	C, F
Grey Mongoose	+	+	+	1, 6	a	F
Otter species	+	+	+	6	a	D
Nilgiri Marten	+	?	?	6	a, e	C, F
Sloth Bear	-	-	+	1		
Indian Giant Squirrel	+	+	+	1	a	C
Giant Flying Squirrel	+	+	+	1	a	C
Travancore Flying Squirrel	?	+	+	1	a	C
Indian Crested Porcupine	+	?	+	2, 3, 4	a, b	C, G, H
Indian Pangolin	+	?	+	3, 4, 6	a	C, G, H
Indian Hare	+	+	+	1	a	C, F
Asian Elephant	+	+	-	2, 5		
Wild Pig	+	+	+	1, 2, 5	a, b	C, F
Indian Spotted Chevrotain	+	?	+	1, 2	a	C, F
Spotted Deer	-	-	+	1	a, b	C, F
Sambar	+	+	+	1	a, b	C, F
Indian Muntjac	+	+	+	1	a, b	C, F
Gaur	+	+	+	1, 2	a, b	C

* +: Occur; -: Absent; ?: No information

\$ 1: Sighted; 2: Fecal deposit; 3: Body parts; 4: Denning/roosting site; 5: Foot prints; 6: people and other evidence

@ a: Meat; b: Crop damage; c: Medicinal value; d: Livestock depredation; e: Honey depredation; f: Bad omen; g: Poultry depredation

& A: Cage; B: Stick; C: Gun; D: Dog and mesh net; E: Poisoning; F: Snare/traps; G: Dig and pierce; H: Smoke

Among all the species of mammals, we paid more attention and we adopted a specific method to assess the lion-tailed macaque in all the study sites. The results are presented

in the Table 4, with comparing the earlier group information by Karanth (1985). In all the sanctuaries and adjacent reserve forest ranges the many number of groups have disappeared. Three decades ago a total of 29 groups were reported (Karanth, 1985), out of that 66% of the groups (19groups) have disappeared. The major reason for the decline of lion-tailed macaque population is hunting for medicine. Now there are no viable populations of the species left in any of these regions, and further the group composition is highly skewed.

Table 4. Comparative status of lion-tailed macaque in study sites and their adjacent ranges

Protected Area	Range	Protection Status	No. of groups	
			Karanth (1985)	Present study
Sharavathi Valley WS	Kogar	WS	5	2
Adjacent ranges to Sharavathi Valley WS	Gersoppa	RF	2	0
	Bhatkala	RF	2	1
Pushpagiri WS	Sampaje	WS	1	0
Adjacent ranges to Pushpagiri WS	Sakaleshpur	RF	2	1
	Yeslur	RF	1	0
	Subramanya	RF	6	2
Talakaveri WS	Bhagamandala	WS	8	3
	Mundrote	WS	2	1
Total			29	10

References

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- Kumara, H.N and Singh, M (2004). The influence of differing hunting practices on the relative abundance of mammals in two rainforest areas of the Western Ghats, India. *Oryx*, 38: 321-327.
- Madhusudan, M.D and Karanth, K.U (2002). Local hunting and the conservation of large mammals in India. *Ambio*, 31: 49-54.

Other Information

I presented the data collected in this project as a 'poster presentation' in XXIst Congress of International Primatological Society, Entebbe, Uganda.

I will submit the poster along with the final technical report.

Based on the present data from this project and also my earlier data on lion-tailed macaque, has influenced the Forest Department to take initiation on develop the conservation strategy to conserve the species.

Due to onset of early monsoon, the data collection in one of the region was delayed. That will be done very soon.

In this interim report, I have not analyzed the data in detail hence I have written the report descriptively.

In couple of months the Final Technical Report will be submitted.