

BHADRA WILDLIFE SANCTUARY AND ITS ENDANGERED ECOSYSTEM¹

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(With a map)

Remnants of Karnataka's once grand wildlife are now concentrated in a few forest pockets in and around Western Ghats. The little known Bhadra wildlife sanctuary, is one such area, potentially superior to many of our better known wildlife habitats. It has many features which make it a priority area for conservation and environmental management.

It is ironical that this area, which owes its uniqueness to an irrigation project, is now being threatened by ecologically ill-conceived developmental activities of rather dubious economic value.

INTRODUCTION

Karnataka has two major wildlife sanctuaries, at Bandipur and Nagarahole, which are well known for their fauna. Little-known Bhadra Wildlife sanctuary, not only far surpasses them in scenic beauty but is also potentially perhaps a better wildlife habitat. In this paper I make an attempt to fill the gap in our knowledge of the natural history of this fascinating area.

In 1951, a part of this area covering 252 sq. km. was constituted as "Jagara Valley Game Sanctuary". In 1972, "Bhadra Wildlife Sanctuary" was constituted by amalgamating Jagara Valley with the adjoining Lakkavalli forests. Bhadra sanctuary, split between Chickmagalur and Bhadravathi forest divisions, now has an area of 492 sq. kms. Its two component areas, Muthodi and Lakkavalli, are ecologically somewhat distinct and are almost conterminous with the two forest ranges of the same name.

It must be noted that considerable forest area, which forms a part of the sanctuary to the north of Bhadra reservoir, is in degraded condition and so do not hold wildlife in any appreciable numbers.

MATERIALS AND METHODS

I have visited the sanctuary in 1972, 73, 74, 78 and twice in 1980. Most of the information presented here was obtained during a status survey of the area carried out on behalf of World Wildlife Fund (Karanth 1978). I have covered almost the entire area on foot and by jeep, concentrating particularly on the favoured wildlife habitats.

Data on the population status of various wild animals were obtained by means of sightings and other supplementary evidence like tracks, calls, droppings, wallows etc. Additional information was obtained from forest department staff and other reliable local sources.

These data on the current status of wild mammals and some reptiles are shown in Table 1, on a comparative scale used by

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Prasad *et al.* (1979). The bird identifications were based on Ali and Ripley (1968).

LOCATION AND PHYSICAL FEATURES

Topography:

Bhadra sanctuary is located in Malnad region of Karnataka, about 50 km to the east of Western Ghats. (130° 30' N., 75° 30' E.).

An imposing outspur of the Western Ghats called Bababudan mountain range rises abruptly from the Deccan plateau forming a rough crescent shape here. Inside the 'crater' formed by them, the terrain is gently undulating (670-760 m elevation) but the mountains reach an elevation of 1200-1500 m. One of these peaks called "Mullaiahna Giri" is, at 1900 m, the highest in Karnataka. Inside the 'crater' another chain of hills called "Kagemane Giri" (Crow's house mountain-in Kannada) further divides the valley. The wildlife sanctuary essentially comprises of Muthodi area lying inside the crescent and Lakkavalli area spread on the northern outer slopes of Bababudans.

Boundaries and approaches:

The sanctuary is bounded on the north by Bhadra reservoir and cultivated plains, on the east and south by the coffee estates in the mountains and on the west by Bhadra river.

Muthodi is 32 kms away from Chickmagalur, and Lakkavalli about the same distance from Shimoga, both being connected by all weather roads. In addition the entire sanctuary is traversed by various forest roads, game roads and unmapped lorry tracks.

Climate:

The temperature in the valley ranges from 10°C to 32°C. Bulk of the rainfall occurs during the Southwest monsoon, between June and September. The annual precipitation is

2000-2540 mm and considerably higher than the 750-1000 mm generally received by the surrounding plains. This is primarily due to the great altitude, topography, vegetation and the consequent characteristic orography of Bababudans.

Water resources:

Bhadra river, originating in the Western Ghats, flows in a northeasterly direction along the foot of the western outer slopes of Bababudans. Somavahini river, draining the area inside the crater passes through a narrow gap in the mountain walls and joins Bhadra river at Hebbe.

Further downstream, Bhadra is dammed up at BR Project area forming a vast (about 200 sq. kms.) reservoir whose backwaters extend nearly 13 kms backwards and lap at the foot of the mountain range.

In addition to these major water sources, there are numerous streams and tanks scattered all over the area, quite a few of them being perennial sources.

VEGETATION

The forests, of the valley floor and northern outer slopes, are of wet deciduous type. The inner slopes are covered by grassy downs with wet deciduous semi-evergreen sholas. On the outer edges of Lakkavalli area, the forests tend to intergrade into dry deciduous type. On the whole, Muthodi area is wetter and more verdant than Lakkavalli, particularly in the dry seasons.

The upper forest canopy contains valuable timber species like *Tectona grandis*, *Dalbergia latifolia*, *Terminalia tomentosa*, *Terminalia paniculata*, *Pterocarpus marsupium* and *Lagerstroemia lanceolata*. Somewhat uniquely, many fig trees (*Ficus* sp.) occur both independently

as well as parasitical strangling figs. The most noteworthy feature of these forests is the vast continuous under canopy of bamboos, both *Dendrocalamus strictus* and *Bamboosa arundinacea* occurring extensively. On the forest floor, dense stands of reeds of *Oxytenathera* sp. and *Ochlandra* sp. can be seen at many places.

Where the canopy is closed, the forest floor is carpeted with wild ginger (*Globba* sp.) and where it is more open, the weed *Eupatorium* has been spreading rapidly.

Low lying areas of the valley floor are often marshy glades (called 'Hadlus') clothed in luxuriant growth of grasses. There are also some grassy banks on mountain slopes and along the edge of the backwaters.

Overall, from the point of view of fodder availability, the dry season 'pinch period' seems less severe in this area than in many other South Indian sanctuaries.

The natural vegetation has been considerably modified by human activity. Forest department plantations, mainly of teak, cover about 6% of the sanctuary area. The inner slopes of Bababudans is under private coffee plantations, sometimes encroaching into the forests. Quite a few of the 'hadlus' and river banks are occupied by paddy farmers.

However, inspite of these drawbacks, it apparently is still an excellent wildlife habitat, as shown by its faunal wealth.

WILDLIFE

The present status of wildlife, determined as accurately as possible, is presented in this paper. I have not taken into account the Amphibians, smaller reptiles, common rodents and Bats. (Table 1).

Reptiles:

Marsh crocodiles used to be found in

Bhadra river in the past, though I could not get any information on their present status. Perhaps they have been decimated by dynamite using fish poachers who seem to be active. Monitor lizards are however fairly common. Rock Python and Hamadryad (King Cobra) both occur — the latter being confined to the Muthodi area.

Birds:

Apart from the great variety of species encountered, what impressed me was the sheer numbers of birds found all over the sanctuary, particularly in Muthodi area. While in many similar forests, one can walk considerable distances without coming across birds, in Muthodi every acre of the forest seems to be alive with birds! During the brief survey 99 species of birds were identified and half a dozen escaped identification. The total bird count for the sanctuary is likely to be over two hundred species.

Some of the birds noted during the survey were; Peafowl (*Pavo cristatus*), Grey Junglefowl (*Gallus sonneratii*), Red spurfowl (*Galloloperedix spadicea*), Painted Bush Quail (*Perdica erythrorhyncha*), Peninsular Turtle Dove (*Streptopelia orientalis*), Emerald Dove (*Chalcophaps indica*), Southern Green Imperial Pigeon (*Ducula aenea*), Jerdon's Imperial Pigeon (*Ducula badia*), Malabar Trogon (*Harpactes fasciatus*), Bluebearded Bee-eater (*Nyctyornis athertoni*), Malabar Grey Hornbill (*Tockus griseus*), Great Black Woodpecker (*Dryocopus javensis*), Pigmy Woodpecker (*Picoides nanus*), Blacknaped Oriole (*Oriolus chinensis*), Southern or Whitebellied Tree Pie (*Dendrocitta leucogastra*), South Indian Black Bulbul (*Hypsipetes madagascariensis*) and Rubythroated Yellow Bulbul (*Pycnonotus melanicterus*). Water birds like Darter (*Anhinga rufa*), Cormorants (*Phalacro-*

TABLE 1
PRESENT STATUS OF THE MAJOR ANIMALS OF BHADRA WILDLIFE SANCTUARY

Common Name	Scientific Name	Status		Favoured Localities
		Muthodi	Lakkavalli	
Bonnet macaque	<i>Macaca radiata</i>	2	2	Occurs around villages
Common langur	<i>Presbytis entellus</i>	4	4	All over
Slender loris	<i>Loris tardigradus</i>	2	2	
Tiger	<i>Panthera tigris</i>	3	2	Kagemanegiri, Tegara gudda
Leopard	<i>Panthera pardus</i>	2	2	
Leopard cat	<i>Felis bengalensis</i>	2	2	
Jungle cat	<i>Felis chaus</i>	2	2	
Rusty spotted cat	<i>Felis rubiginosa</i>	—	—	Part of its nominal range
Small Indian civet	<i>Viverricula indica</i>	—	—	" " "
Common Palm civet	<i>Paradoxurus hermophroditus</i>	2	2	
Brown Palm civet	<i>Paradoxurus jerdoni</i>	—	—	Its normal range
Common mongoose	<i>Herpestes edwardsi</i>	2	2	
Stripenecked mongoose	<i>Herpestes vitticollis</i>	2	2	
Ruddy mongoose	<i>Herpestes smithi</i>	—	—	Part of its range
Brown mongoose	<i>Herpestes fuscus</i>	—	—	Part of its range
Striped hyena	<i>Hyaena hyaena</i>	1	1	very rare
Jackal	<i>Canis aures</i>	3	3	All over
Indian fox	<i>Vulpes bengalensis</i>	—	—	Doubtful
Indian wild dog	<i>Cuon alpinus</i>	3	2	All over
Sloth bear	<i>Melursus ursinus</i>	1	2	Kavalapura
Common otter	<i>Lutra lutra</i>	—	2	Bhadra reservoir
Smooth Indian otter	<i>Lutra perspicillata</i>	—	—	?
Ratel	<i>Mellivora capensis</i>	—	—	Doubtful
Large brown flying squirrel	<i>Petaurista petaurista</i>	2	2	
Indian giant squirrel	<i>Rutufa indica</i>	4	4	All over
Indian porcupine	<i>Hystrix indica</i>	3	3	
Blacknaped hare	<i>Lepus nigricollis nigricollis</i>	3	3	All over
Elephant	<i>Elephas maximus</i>	3	3	
Gaur	<i>Bos gaurus</i>	4	4	
Fourhorned antelope	<i>Tetracerus quadricornis</i>	0	—	
Sambar	<i>Cervus unicolor</i>	3	3	All over the Muthodi Region
Spotted deer	<i>Axis axis</i>	2	3	Chandrana hadlu
Barking deer	<i>Muntiacus muntjak</i>	3	3	All over
Mouse deer	<i>Tragulus meminna</i>	2	2	
Wild pig	<i>Sus scrofa</i>	4	4	All over
Pangolin	<i>Manis crassicaudata</i>	2	—	
Python	<i>Python molurus</i>	2	2	
Hamadrayad	<i>Ophiophagus hannah</i>	2	0	Muthodi
Marsh crocodile	<i>Crocodylus palustris</i>	—	—	
Monitor lizard	<i>Varanus bengalensis</i>	2	—	

0 = Absent; — = No Information; 1 = Rare; 2 = Present; 3 = Frequent; 4 = Very Common.

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corax sp.) and Large Egret (*Egretta alba*) were observed on the shallow backwaters. These with many half submerged trees and small islands, may attract more water birds at other times of the year. Potentially, this part of the sanctuary seems to be an excellent waterfowl habitat.

Mammals:

Common langur is abundant in the forests but Bonnet macaque is rather uncommon. Liontailed macaque is absent.

Tigers are not unusual, as frequent cattle kills are reported, particularly around Tegara Gudda and Kagemane Giri, where the Tigers retreat to avoid the disturbance caused by bamboo extraction. There may be about half a dozen tigers, though a census conducted in 1972 reported 12 tigers. Whatever their actual present population is, by properly managing the sanctuary, many more tigers will move in from the adjoining disturbed forest areas. This is one of the few areas where a breeding population of tigers can establish itself, and survive on natural prey.

Leopards are fairly common particularly in Lakkavalli area. In 1980 April, I saw a leopard stalking langurs near Sukalahatti. Among other smaller carnivores, like cats, civets and mongooses, I could positively determine the existence of a few. However, some other species about which no information could be obtained are also likely to be present (Prater 1965).

Striped hyenas are rare in the sanctuary. They seem to be more common in the drier plains and also used to be common in the heavy rainfall regions of Karnataka's coastal districts. But for some ecological reason they seem to avoid the wet deciduous forest tracts between the Western Ghats and the plains of Deccan. Wild dog tracks are found all over the area.

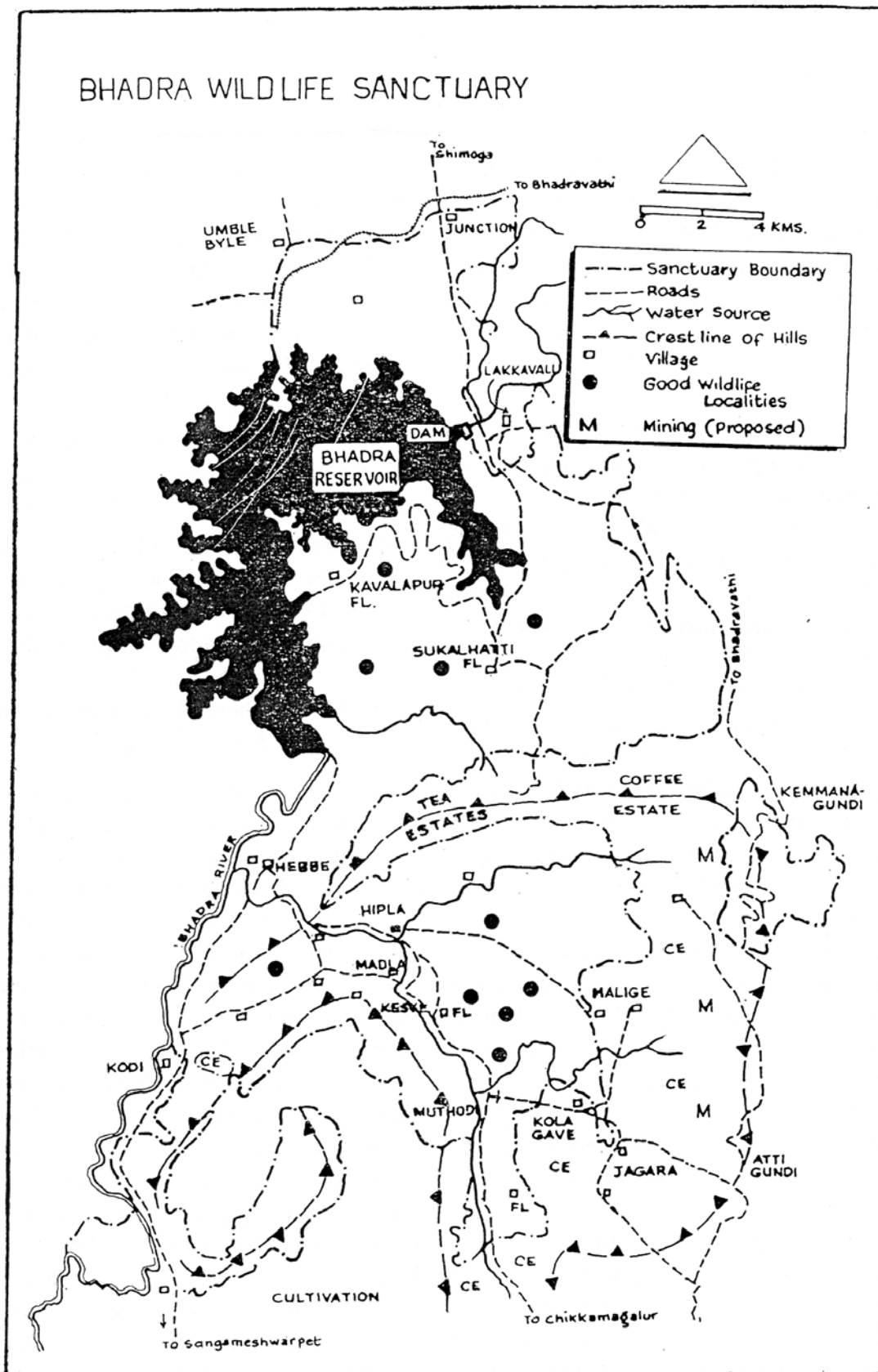
Sloth bears are rare and mostly confined to higher regions of Lakkavalli. There is a record of a bear being run over by a truck near Muthodi in the early seventies. This relative scarcity of bears here, when compared to the wet deciduous forests of Mysore plateau and evergreen forests of Western Ghats, is rather intriguing.

Giant squirrels are abundant and otters (*Lutra* sp.) are reported to occur in Bhadra reservoir.

Elephants occur in all parts of the sanctuary and seem to migrate locally between Muthodi and Lakkavalli depending to some extent on the ripening of paddy crops in the villages in and around the forests. During November 1980, for instance, most of the elephants seemed to be in Muthodi area.

Gaur certainly are the pride of Bhadra. Ecological suitability of the habitat coupled with the isolation of this area from the outbreaks of Rinderpest in 1968, seem to be the cause of their relative abundance. At a very rough guess, there may be around 1000 gaur here. They are certainly more numerous here than in many of the better known sanctuaries of our country. The large proportion of calves seen with the herds indicates a growing population. Also apparently, the carrying capacity of the habitat seems to be adequate for the gaur population since they do not raid crops here as in other parts of their range in Western Ghats. However, with the flowering/death of bamboo *Dendrocalamus strictus* in 1980, there will be a severe reduction of fodder availability to gaur and elephants. The death of bamboo and consequent opening up of the canopy will further increase fire hazards and accelerate the spread of *Eupatorium* weed, which in turn will further reduce fodder supply to the wild herbivores. Consequently,

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incidence of crop raiding and conflict with the farmers will also increase.

Sambar, spotted deer, barking deer, wild pig and mouse deer occur. The four-horned antelope does not occur in the sanctuary though its presence in the drier fringes of Lakkavalli cannot be entirely ruled out.

With a minimum of management, primarily in terms of antipoaching work and rational forestry, this splendid area will be an ideal habitat for a wide range of wild animals. Even now, Chandrana Hadlu, Dodda Hadlu, Nagara bhavi, Tegara Gudda, Kavalapura, Koramar gudda and Sukhalatti are excellent localities for wildlife (see map).

CONSERVATION AND ASSOCIATED PROBLEMS:

Dams and irrigation projects have generally spelled disaster for forests and wildlife in our country. Bhadra wildlife sanctuary so far seems to be a happy exception to this rule! Bhadra reservoir created in the sixties, completely cut off the two main roads running through this area, connecting Chickmagalur to towns in Shimoga district. As a result, the wildlife rich Muthodi valley became isolated and remained mercifully backward in terms of "development", as measured in our country. In the seventies, some dynamic officers of the State Forest Department armed with the Wildlife Protection Act (1972) did, to some extent, curtail the rampant poaching spree of earlier days. All these factors helped the wildlife populations to recover and the sanctuary improved gradually upto 1978.

Since then, however, human pressures are building up again and are likely to undo all the good work of the past.

1. The State Irrigation Department, is planning a dam across Somavahini river within the Muthodi valley, to divert its waters from the

Bhadra reservoir to irrigate some other areas beyond the Bababudan mountains! If this project with its rather nebulous 'economic value' is executed, the forestry, agriculture and wildlife in the entire valley will be totally destroyed.

2. National Mineral Development Corporation's (NMDC) investigations indicate the feasibility of establishing magnetite ore mines on the inner slopes of Bababudans. These are visualised to be three times the size of the gigantic (Rs. 6000 million) Kudremukh Project. The environmental impact of these, on the local rainfall pattern (vital to the coffee crop), soil, siltation rate in Bhadra reservoir, forestry resources and wildlife have been ignored. However, due to problems connected with the international iron ore market, this particular threat seems to be off, temporarily.

3. State Government owned Mysore Paper Mills at Bhadravathi has started intensive extraction of bamboo in the sanctuary since 1978. So far, this extraction has been done in a most haphazard manner, with scarcely a thought for wildlife and its requirements. I feel, the wildlife sanctuary, or at least a sufficiently large part of it vital to wildlife, must be left unexploited. Of late, there seems to be some interest being shown by the paper mills in these things. Incidentally, this paper mill has gaur (bison) as its trade mark!

4. This wildlife sanctuary badly needs effective management in terms of anti-poaching work, fire protection, relocation of villages, control over grazing by domestic cattle and ill-conceived plans for 'wildlife tourism'. I was particularly unhappy to note that since 1979, antipoaching work seems to have declined and poaching seemed to be on the increase. Prompt payment of compensation for cattle killed by carnivores has also declined during this period, endangering tigers. All these

lacunae are likely to prove disastrous for the wildlife, in an area like this, surrounded as it is, by wealthy, trigger-happy planters and farmers.

CONCLUSIONS

It is hoped that various organisations concerned with conservation will take note of this and pressurise the State and Central Governments to take immediate steps to properly manage this area, ecologically vital not only for its wildlife but also to the rich agricultural systems and industries that depend on it.

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