

# Field Studies in the Kanha National Park

(Summary)

Between August 25th and September 20th, 1972, 42 members of the Zoological Institute and the Zoological Museum of the Zurich University were engaged in field studies in the Kanha National Park (M.P., India). The Kanha National Park well suited the idea of a field camp for education in tropical ecology and field research, because the team could base its investigations on regular population counts by the Madhya Pradesh Forest Department since 1955, a 13 months' ecological and behavioural survey on larger mammals by G. SCHALLER (1967) in 1964 and 1965, and the findings of C. MARTIN of Zurich University, who was at this time completing his 2 years' study on the ecology of the swamp deer.

Intensive short studies were carried out in 7 small groups of investigators: 3 faunistical surveys were carried out on Drosophilids, birds and smaller mammals. In an ecological survey data on tiger tracks were gathered. Different aspects on the feeding behaviour of Hanuman langurs were studied by a further team. Two groups were engaged in analyses of the population dynamics in axis deer and the social organisation of the black buck respectively. To this report 3 papers were added dealing with the ecology of the grassflora, the population dynamics of the barasingha and occasional observations of the wild dog.

The larger mammals, main objects of our studies, concentrate on and in the vicinity of the central savannah habitats. Two of them have been compared (C. MARTIN and M. L. HUBER, p. 11): a high grass area and a yearly burnt one (Kanha meadows). It was found that regularly burnt grass covers lack important perennial species such as *Themeda triandra*. Grasses of not burnt habitats grow higher and belong mainly to perennial species. They offer more food and cover to various wild living species.

Collections of Drosophilids with banana baits were made from August 26th to September 18th, 1972, at 8 sites in the center of the Kanha National Park (G. BAECHLI, p. 23). Tables 1 and 2 (p. 24 and p. 29) give information about the species collected and the number of specimens per species. Five species are recorded from India for the first time. Faunistical, taxonomic and ecological results are discussed. Domestic and cosmopolitan species were mostly absent. In the collection period the ecological conditions are therefore considered non-domestic.

In an ornithological survey (M. GUENTERT and D. HOMBERGER, p. 31) 99 bird species were recorded by direct observation and trapping with nets. *Picus chlorolophus* Vieillot was recorded in the central Deccan for the first time. Effects by seasonal burning of the central Kanha meadows on the density of passerine birds are discussed basing on a quantitative investigation of selected species. It was found that high grass zones show higher population densities than regularly burnt areas (Tab. 2, p. 38).

Small mammals of the Kanha National Park were collected (C. CLAUDE, p. 55). Ten species could be recorded. Most important is the catch of *Crocidura horsfieldi*. So far no specimen of the genus *Crocidura* was known in Central India. *Mus cervicolor* with long *Diastemas* and *Nasalia* had no spiny hairs on their back as it is characteristic for the subspecies *phillipsi* of the Central Provinces. Dates on the morphology and the reproductive status of the populations are given. Most species are at the beginning of reproduction. At least in the beginning of the rainy season the reproduction must have been interrupted. In the plane Kanhameadows with short and sparse grasses no small mammals could be trapped by standard-minimum-method. However trapping with the same method in a meadow at Sonph, where plantcover was high and dense, 47 small mammals were caught within five days.

Hanuman langurs are the only monkeys in the Kanha National Park (U. NAGEL and F. LOHRI, p. 77). They inhabit the deciduous Sal-forest (*Shorea robusta*) and the adjacent savannahs and meadows in the center of the Park with a population density of 20–25 animals per km<sup>2</sup>. The results of an investigation on the langurs' feeding behaviour in the trees confirmed quantitatively some hypotheses on the social organization of foraging, put forward by RIPLEY (1970). The age of the langurs and the type of food (leaves, petioles, flowers, fruits, shoots) influenced significantly the feeding, the length of feeding bouts (staying at one place) and the number of major moves during feeding in the trees. By means of several behavioural mechanisms the langurs are able to regulate the density and distribution of animals in the food tree. Thereby a number of langurs can feed together in a tree during periods of up to 1½ hours with a minimum of conflict. Being leaf-eaters the langurs are practically without food-competitors in the trees, where they spend about 80% of their time. On the ground, considerable food competition comes from the abundant spotted deer (*Axis axis*), whereas the langurs don't deprive the deer of much food, but rather provide them new food resources. When eating leaves, fruits or flowers from a tree, the langurs often drop considerable parts. These are taken by the spotted deer, who besides grass feeds on a broad spectrum of browse. Such commensalism between langurs and deer has been observed at different places in India. It occurs, however, only locally and the local deer population probably conserves this habit by tradition. In the Kanha Park we recorded commensalism only in about 1 out of 10 cases when both species were seen together. Commensalism was at this time of the year (end of monsoon) limited to 2 terminalia tree species. There the langurs ate only the petioles (about 5% of the fresh weight) and the deer get the big part (95%) of the terminalia leaf.

Commensalism may be responsible for the wide distribution of the axis population in the Kanha National Park. In 14 observation days, 3558 Axis deer were tallied of which 2922 could be distinguished according to 8 different age and sex classes (D. HARTMANN, A. HOFMANN and K. ROBIN, p. 87). The sex ratio was found to be 100 females to 80–89 males. Natality rate (36.0%) is lower than 8 years ago (64–68%, SCHALLER, 1967). Mortality rate has been calculated for the male population. 62.2% die before reaching the age of one year. Group size and structures have been compared. Smaller groups with less than 100 members consist of more females (mainly with a calf at heel), but less males (mainly old stags) than larger groups.

The population structure of the Barasingha population of the Kanha National Park was studied by C. MARTIN (p. 97) between April 1971 and November 1972, and compared with the findings of SCHALLER (1967). Population size and reproduction rate have increased by 100%. In 1964 reproduction rate was 7%, in 1972 it was estimated at 15%. The pronounced increase is most probably due to less burning of grass habitats, additional artificial swamp areas and better antipoaching measures.

The black buck population of the Kanha National Park has been studied during its main mating season (E. MEIER et al., p. 107). Observations were based on an ethogram. During rut the population lives in several different groups. Adult bucks mark and defend territories, in which they herd harems consisting of several adult females and their offsprings. On several occasions changes of females from one territory into another were observed. Nonterritorial males live solitary or in bachelor groups. The social organization of a bachelor group is described.

R. KELLER (p. 129) summarized occasional observation by all team members on the dhole (*cuon alpinus*) population of the Kanha National Park, which splits in groups of 2 to 12 animals. Groups are found to be larger in the morning than in the afternoon and evening. Hunting dholes were observed on several occasions. Their daily range could be estimated. Dholes hunt in packs. Of 20 hunts observed, only 4 were successful. A number of behaviour patterns are described.

The prey composition of the tiger in the Kanha National Park was described by means of analyses of faeces (K. MUELLER and F. ZUERCHER, p. 137). The quantitative methods of identification by pug marks is discussed. Fore- and hind-feet can be distinguished by their forms. A new method using photographic cameras is proposed for track analysing.

The results of the one month survey can be considered as important contribution to more intensive studies on the ecosystem, which are continued under the guidance of a WWF Patronage Committee for Kanha.