

**Population age-sex ratios of elephants in Rajaji-Corbett National Parks,
Uttaranchal**

Annual Progress Report on Corbett NP Elephant age-sex ratios



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Submitted by

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Introduction

The Asian elephant in India occurs in five major dis-jointed populations totalling 17,000 to 22,000 individuals (Anon 1993). In north-west India, an estimated 800-1000 elephants occur in Rajaji-Corbett National Parks and the adjoining forest areas (Singh 1995, Johnsingh and Joshua 1994). This range has been designated as Elephant Reserve No. 11 by the Government of India under Project Elephant. Though ecological research on elephants in this area began in 1986, a detailed study on the elephant demography in this tract started in 1996. The study on elephant demography concentrated mainly to the areas to the west of the river Ganges between 1996 and 1999. However, the population age-sex ratios in Corbett NP were monitored every year for a week to ten days in summer, during this period, when most of the elephants were concentrated around the Chauras (grass lands). The study results indicated that the elephant population in this tract had one of the least skewed sex ratios (1:1.87 Male:Females in Rajaji NP and 1:1.5-2.17 Male:Females in Corbett NP).

However, increase in mortality of adult males in early 2001 due to poaching in this tract is a cause for worry and this project is being implemented with the aim of adding, in a small way, to the Government efforts to conserve elephants in Uttaranchal State by regular monitoring of elephant age-sex ratios.

The objectives was;

1. To monitor the age-sex ratios of the elephant population across the elephant habitat in Uttaranchal, with special emphasis on Rajaji-Corbett National Parks Jan 2002 to Dec 2007.

Study Area:

Corbett Tiger Reserve is spread over areas of Nainital, Almora, Pauri Garhwal and Bijnore Districts of Uttar Pradesh. The present area of the Reserve is 1318.54 sq. km. including 520.82 sq. km. of core area and 797.72 sq. km. of buffer area. The core area forms the Corbett National Park while the buffer contains reserve forests (496.54 sq. km.) as well as the Sonanadi Wildlife Sanctuary (301.18 sq.km.). The core is bounded to the North by the Kanda Ridge, with a height of 1043 m at its highest point. The entire area of the reserve is mountainous and falls in the Sivalik and Outer Himalaya geological province. It forms the catchment area of the Ramganga, a tributary of the Ganga. The Ramganga flows from East to West in the reserve through landscapes of incredible beauty. The Ramganga was dammed at Kalagarh at the south-western end of the reserve in 1974. The reservoir created submerged 40 sq. km. of prime grassland. The area on the western side of the reservoir now constitutes the Sonanadi Wildlife Sanctuary.

In Corbett NP, our study mainly concentrated on the areas in and around Dhikala.

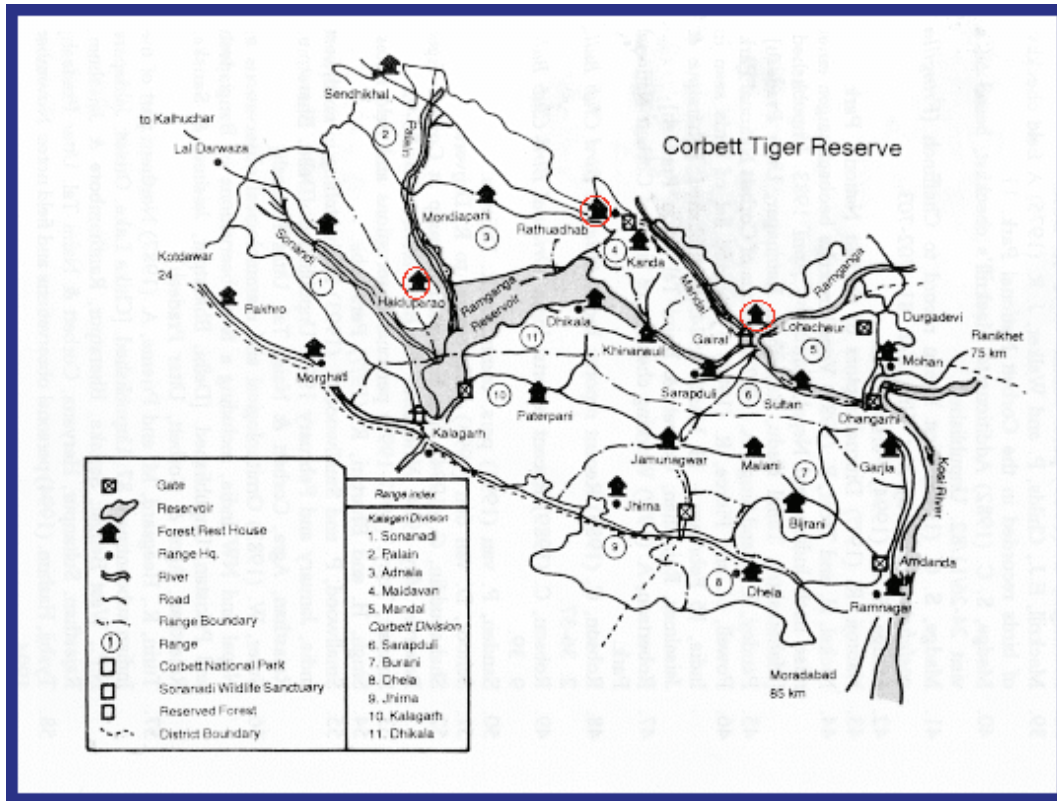


Fig. 1. Map of Corbett National Park, Uttaranchal

Methods

The Chours around Dhikala were searched for elephants in the morning and evening for about approximately 4 hours in a single search for 7 days in June 2002. Whenever an elephant group was encountered, I would wait for it to cross the road so all the group members could be captured on video. All males even if they were not near the road or crossing the road were captured on the video. The video was then converted to digital files and played back either on a TV or a computer screen and the elephants were classified into various age-sex categories based on relative height and morphological characteristics. Younger elephants (< 15-years) will be classified by comparing their height to the oldest adult female in the group

(Eisenberg and Lockhart 1972). The older elephants will be classified based on morphological characteristics like degree of ear fold and depression of the buccal cavity and forehead. Elephants were placed in broad age-classes aged groups; calves (< 1 year old), juveniles (1-5 years old), sub-adults (5 -15 years) and adults (> 15 years).

Progress and preliminary results:

In May 2004, a total of 333 elephants from 22 groups and 11 adult male sightings were recorded and analysed. Sixty one adult and sub-adult males were sighted either solitary, in all male groups or were accompanying the 13 groups recorded. Out of 22 female groups, sometimes with males accompanying them, recorded on video and analysed, a total of 322 elephants were classified. Only data for fully classified groups were used. It should be noted that many groups and individual males could have been classified repeatedly to derive sex ratios over the sampling period and therefore this total of 333 elephants should not be taken as a population count. The data for 2005 has just been converted to a format where it can be analysed and we hope to submit the results of 2005 before June 2006.

It looks from a preliminary analysis of the data that Corbett National Park still has a very healthy adult sex ratio of 1 male: 4.06 females. This is from all records still among the best sex ratios in South Asia, where elephant population age-sex structures have been studied intensively. This is comparative to the data obtained in 1996 (Williams et. al. 1996) where the male:female ratio was 1:2.17 (Appendix 1) and 1:2.64 (Williams 2002). There is a difference, but whether this is an artefact of

sampling, where there is bound to be some differences in proportions measured from year to year or an actual measurement of skewing of sex ratios can only be found through continuous tracking of the sex ratios over many years – something that this study is attempting.

More than just adult sex ratios, it is important to look at other population parameters like no. of calves:100 females or the percentage of females accompanied by a young one less than 5 years old. The population is relatively healthy and about 94.9% of the adult females (n=118) were accompanied by a young one less than 5 years. This shows that the reproduction in the Corbett population is extremely good (compared against tables in appendix 1).

Conclusion

We hope over the next two years we will be able to collect and maintain a good record of the elephant population demography in Corbett and Rajaji National Parks. The report for the 2005 data for Corbett National park area is being written up and will be submitted shortly.

Table 2 The age-sex structure of the elephants classified (N = 333) in Corbett National Park, May 2004.

Age-class	Percentage	
	Males	Females
Adults	8.71	35.44
Sub-adults	9.61	12.61
Juveniles	24.32	
Calves	9.31	

Acknowledgements

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References

- Anon 1993. Project Elephant (Gajatme). Ministry of Environment and Forests, Government of India, New Delhi.
- Eisenberg, J.F. and Lockhart, M., 1972. An ecological reconnaissance of Wilapattu National Park, Ceylon. Smithsonian Contribution to Zoology. Vol. 101. Smithsonian Institution, Washington, DC, pp.1-118.
- Johnsingh, A.J.T. and J. Joshua. 1994. Conserving Rajaji and Corbett National Parks – the elephant as a flagship species. *Oryx* 28:135-140.
- Singh, K.N. 1995. Asiatic elephants in Uttar Pradesh (India). Status and strategy for conservation. Pages 32-48 in J.C. Daniel and H.S. Datye, Editors. *A week with elephants*, Bombay Natural History Society, Oxford University Press, Bombay
- Williams, A.C. (2003). Elephants, their habitats in Rajaji-Corbett National Parks, Northwest India. Ph.D. Thesis. Saurashtra University, Rajkot.
- Williams. A.C., A.J.T. Johnsingh and Goyal S.P. (1996) The Inter-relationships between large herbivores, habitat and humans in Rajaji-Corbett National Parks, U.P. Annual report submitted to WII, Dehradun

Appendix 1

Table 1. The age-sex structure of elephants in Corbett NP (Williams et. al. 1996)

AGE-SEX CLASS	NO.s	PROP.
ADULT FEMALES	52	0.327
SA-FEMALES	20	0.126
JUV. FEMALES	26	0.164
CALVES	6	0.038
JUV. MALES	15	0.094
SA-MALES	16	0.101
ADULT MALES	24	0.151
TOTAL	159	

Table 2. The age-sex structure of the elephants classified (N = 333) in Corbett National Park, May 2002.

Age-class	Percentage	
	Males	Females
Adults	13.86	36.63
Sub-adults	8.91	10.4
Juveniles	23.76	
Calves	6.44	

