FINAL REPORT

Distribution and Dynamics of Tiger and Prey populations in Maharashtra, India – Year 2 Surveys

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DISTRIBUTION AND DYNAMICS OF TIGER AND PREY POPULATIONS IN MAHARASHTRA, INDIA – YEAR 2 SURVEYS

FINAL REPORT – JULY 2003 TO JUNE 2004

1. Introduction

In India, tigers are distributed over 300,000 square kilometres of area and Maharashtra is one of the important tiger range states in the country. The state has an impressive variety of wildlife habitats and has a potential tiger habitat of about 6,000 – 9,000 square kilometres. The state has implemented several positive measures to improve the status of wildlife and it's habitat in Maharashtra. However, there is no reliable information on the current distributional range of tiger populations in Maharashtra and any measures of their relative abundance in order to adaptively react to their management needs. There is a need to monitor tiger and prey populations in a few select habitats with potentially viable breeding tiger populations in Maharashtra to ensure their long-term survival.

Earlier studies by the Principal Investigator have identified several high-priority tiger-conservation areas in the country and have gathered baseline ecological information on tiger and prey populations in several high-potential tiger habitats across India. These studies have also suggested several methodologies for effective monitoring of tiger and prey populations over large regions and at multiple scales. The present project proposal is a step towards implementing these ideas by actually monitoring tiger and prey populations at multiple scales in the state of Maharashtra.

This project during its first year surveys had established benchmark population estimates of tiger and prey populations at three critical and productive tiger habitats in Maharashtra state. The second year surveys primarily aim at continuing population monitoring efforts at Tadoba, Melghat and Pench reserves of Maharashtra.

2. Personnel and Institutional involvement

The Centre for Wildlife Studies, Bangalore, which is the chief implementing agency of all WCS projects in India, is administering the project. Wildlife Conservation Society, New York (WCS-NY) is providing the services of Principal Investigator, in addition to the funding, logistic and technical support. The Rhinoceros and Tiger Conservation Fund (RTCF) of US Fish and Wildlife Service and Save The Tiger Fund (STF) of National Fish and Wildlife Foundation have provided funding for the first and second year surveys in Maharashtra. The project is being implemented with the co-operation of the Maharashtra State Forest Department and permissions from Chief Wildlife Warden of the state.

3. Research activities and accomplishments

Field Site: Tadoba-Andhari Tiger Reserve

1. Line transect surveys for the second consecutive year were conducted at Tadoba during March 2004. A total sampling effort of 816 km was walked to collect field data. The survey resulted in 485 sightings of prey animals, which included chital, sambar, nilgai, muntjak, chousingha, gaur, pig and langur monkey. This data will be used to derive absolute abundance of prey populations. Preparatory work prior to the transect surveys involved remarking, re-laying and maintenance of thirty-six transect lines. Detailed analysis to estimate prey densities is under progress.

2. Carnivore sign encounter surveys were also conducted for the second consecutive year at Tadoba Reserve to obtain indices of relative abundance for tigers and other large sympatric carnivores. The surveys were conducted in March 2004 along 24 sampling routes with a cumulative effort of 269.6 km of sampling walk. A total of 144 carnivore scats were encountered during these surveys, which included scats of tiger (57), leopard (61) and dhole (6). The scats were also collected to analyse the dietary pattern of these carnivores based on the prey remains found in these specimens.

3. Prey remains from 255 carnivore scats (collected during the first year surveys) were identified to estimate relative frequency, prey biomass consumed and number of individual prey consumed by three large sympatric carnivores across selected sites. 10 prey species occurred in tiger scats whereas leopard scats contained 8 prey species and dhole scats contained 4 prey species. Livestock presence was observed in two of the tiger scats. The food habit study indicate that large prey such as sambar and gaur contributed more than two-third of the prey biomass in tiger's diet in Tadoba. Medium sized prey like chital and pig accounted for 22 % of its diet whereas remaining prey species together contributed only 9% in its diet. Results further indicate that sambar, chital and wild pig is the most important prey for all the three top predators in Tadoba. The detailed prey selectivity analysis is under progress.

Field Site: Melghat Tiger Reserve

1. Line transect survey for the second consecutive year was conducted at Melghat Tiger reserve during May – June 2004. A total of 680 km was walked during these surveys and 537 prey groups of animals were sighted. The prey species that were sampled included chital, sambar, nilgai, muntjak, chousingha, gaur, pig, langur and rhesus monkeys. Detailed analysis of the transect count data to estimate prey densities is under progress.

2. Prior to the transect surveys, all preparatory activities were completed. The work included remarking and re-laying of twenty-five transect lines, each of four km in length. The work also included making of access roads / trails (to transect lines) which had got completely washed off during the monsoon.

Field Site: Pench Tiger Reserve

1. A total of 22 sampling routes were identified to obtain scats of tigers, leopards and dholes, which together accounted for a cumulative sampling effort of 233 km. Carnivore sign encounter surveys were conducted along these routes to obtain indices of relative abundance for tigers and other large sympatric carnivores, in January 2004. A total of 105 carnivore scats were collected during these sign encounter surveys, which included 56 tiger scats, 35 leopard scats and 14 dhole scats. Scat specimens were also collected for food-habit study of these carnivores.

2. Carnivore scat samples were washed and prey remains consisting mostly of hair and bone fragments were used for identifying the prey species. Prey species was identified using the microscopic and macroscopic morphological features of hairs. Six prey species occurred in tiger scats whereas seven and four prey species occurred in leopard and dhole scats respectively. Sambar occurred in 50% of tiger scats followed by pig (23%) and chital (11%). Sambar and gaur together contributed to nearly 80% of the prey biomass consumed by tiger, whereas chital and wild pig contributed nearly 50% in leopard's as well as dhole's diet. The contribution of the smaller prey (muntjak, chousingha, langur, rhesus macaque and hare) was very low in the diets of all the three sympatric predators. Detailed prey selectivity analysis is in progress.

3. Preparatory work has also been completed at Pench Tiger reserve to carry out line transect surveys for the second consecutive year. The work included remarking and laying of thirty transect lines. However, surveys could not be carried out due to logistic problems.

4. Training and capacity building

1. Four local field assistants (Sawan and Vishal in Melghat, and, Manoj and Ashish in Tadoba / Pench reserves) were trained in laying and marking of transect lines and the use of GPS equipment. The entire field operations were co-ordinated by Harshawardhan and Poonam Dhanwatey at Tadoba and Pench reserves, and, Jayant Kulkarni and Prachi Mehta at Melghat reserve, our local collaborating partners in Maharashtra, with assistance from CWS field research team.

2. Five field-training workshops (two in Tadoba and three in Melghat) were conducted on the use of sampling based methods for monitoring large prey and predator populations, as part of capacity building and training activities. 21 field protection staff from Maharashtra State Forest Department and 37 NGO volunteers participated in the workshops held at Maharashtra sites, whereas 12 senior instructors from Centre for Wildlife Studies assisted the research team in field training.

3. Two training workshops were also conducted at Pench and Tadoba reserves on the use of index-based surveys for monitoring tiger and prey populations. 4 field staff from the Forest Department and 29 volunteers from local NGOs participated in these carnivore scat encounter surveys.

4. V. Sujai, a graduate student from the Bharathidasan University, India, was trained in identifying prey remains from carnivore scats and to analyse the dietary preferences of three large sympatric carnivores (tiger, leopard and dhole). This study was carried out under the guidance of Ullas Karanth and Samba Kumar, which formed the basis for Sujai's MSc degree.

5. Ullas Karanth and Samba Kumar organized an international field training workshop on sampling based approaches for monitoring tigers and their prey at Tadoba reserve in central India during January 2004. The workshop was organized in collaboration with WWF – International and WWF – India in which 15 field staff from eight WWF regional program participated in this workshop. Maharashtra state forest department provided all the necessary support and facilities to conduct this workshop.

5. Goals and activities for the next year

The following are the field activities scheduled for completion in next six months.

1. Complete year-3 field surveys in all the sites.

2. Carry out index-based surveys in study sites.

3. Conduct field training workshops for Forest Department staff and NGO volunteers and continue capacity building exercises.

4. Prepare final technical report and posters on camera trapping and transect surveys for wider dissemination of the results.