

Ecological Monitoring of Tigers in Orang National Park Assam, India

First Year (2008-09)

Project Investigator

M Firoz Ahmed

Report prepared by

M. Firoz Ahmed, Chatrapati Das, Dhritiman Das,
Pranjit Sarma, Jayanta Deka, Bhupendra Nath Talukdar,
Sukumar Momin and Bibhab Kumar Talukdar

July 2009

Supported by



Implemented by

Aaranyak

50, Samanwoy Path, Survey,
Beltola; Guwahati-781028
Assam, India
www.aaranyak.org

Collaborating Agencies



Forest Dept. Assam



Acknowledgements

We thank our donors to the Tiger Conservation and Research Initiative (TRCI):
SeaWorld Busch Gardens Conservation Fund for supporting this study.
US Fish and Wildlife Service's RTC Fund for supporting Tiger conservation planning in Assam.
David Shepherd Wildlife Foundation for supporting Equipments.
Rufford Maurice Laing Foundation for support to tiger conservation in Assam.

We thank the following institutions for support and help throughout-
Department of Forest, Assam
The Orang National Park Authority
The Wildlife Institute of India
Brihattae Silbari Banyaprani Suraksha Sangtha

We thank the following officials for support and help throughout-
Shri M C Malakar, ex Chief Wildlife Warden of Assam
Shri S Chand, PCCF Wildlife, Assam
Shri D M Singh, CCF Wildlife
Shri B S Bonal, CCF Monitoring
Shri Gopal Chetry, Research Officer
Shri Qumar Qureshi, Professor, WII
Shri Y V Jhala, Professor, WII
Shri Bivash Pandav, Tiger Coordinator, WWF International.
Shri Abishek Hariha, Researcher, WII

We thank the following staff of Orang for support and help during field work-
P. Sharma, Khalil Ali, D. Sharma, M. C. Boro, Madhab Deka, Shamyal Dey, Gobinda Mahato, Bolo Choudhuri, Taizuddin Ahmed, Rajak Ali, Rustam Ali, Mangal Boro, Mahato, Kamaluddin Ali and Sashi all other staff who assisted directly or indirectly.

We thank Bapkon and Salam for their assistance in developing and maintaining our community relationship around ONP.

We thank the following individual for support and help during field work-
Santanu Dey, Udayan Barthakur, Kamal Azad, Sunit Das, Ajit Boro, Jonson Das, Anil Das, Biraj Saikia and all the colleagues at Aaranyak.

Suggested Citation:

Ahmed, M. F., C. Das, D. Das, P. Sarma, J. Deka, B. N. Talukdar, S. Momin and B. K. Talukdar. 2009. Ecological Monitoring of Tigers in Orang National Park, Assam, India. First Year (2008-09). Technical Report, Aaranyak, TRCI: 01/2009. pp 1-28.

Introduction

As the majestic tiger is no longer burning bright in the forest of the night, it has been a grave concern of late all over the globe.

The Royal Bengal tiger (*Panthera tigris tigris*) is categorized as Endangered on the IUCN Red List (IUCN, 2008) with a declining trend in population and a conservation dependent species listed under Schedule-I of Wildlife (Protection) Act, 1972 in India and Appendix-I of the CITES. This species is the most threatened large carnivore in India (Das *et al.*, 2007).

Tigers are under threat mainly due to habitat loss, depletion of prey population and direct killing (Sanderson *et al.*, 2006). Tiger population has dwindled drastically all over and remaining species are now found in small and isolated groups in different locations. The precarious conservation status of tiger has aroused global concern in recent years. Tiger has been an important flagship species for biodiversity and wildlife conservation in India over the past thirty years (Karanth and Nichols, 2000). But in India the habitats of wild tigers have been reduced dramatically over the last century. The alarm has been ringing since the Sariska tiger-zero incidences few years back that took the nation by surprise.

Adorned by the foothills of the Himalayas and the mighty Brahmaputra River, Assam is recognized as one of the significant and potential natural tiger habitat in the world. Manas, Nameri, Kaziranga and Orang are few important tiger conservation sites in Assam that offer promising prospects for tiger conservation. Though, floodplain ecosystem like Kaziranga National Park in Assam is known to have highest density of tigers in the world, the conservation status of tigers in the state is also not different from that in rest of the India.

Incidents of killing of tigers using poisons in different parts of Assam recently well reflected the gravity of Tiger-human conflict in Assam. Orang National Park is one of sites where tigers were poisoned to death by miscreants. The situation calls urgent need to obtain reliable estimates of tiger density in Orang National Park.

As per the last census, the Orang National Park harbored about 19 tiger (Data source: Forest Dept., Assam; census year 2000, based on pug marks). The Orang National Park is under considerable anthropogenic pressure due to its small size and geographical location. It is though unlikely that as many tigers would live in Orang National Park given its smaller area and limited prey biomass. As the existing tiger population is facing crunch of prey animals in the Park, the big cats tend to stray to fringe areas to kill cattle. The increase in incidents of human-tiger conflicts has led to most incidence of retaliatory killing of tigers in and around the Park than anywhere else in the region.

Since the one-horned rhino is the major flagship conservation species in the national park, there is, however, ample scope to augment management and conservation of tiger population in the Park.

We carried out this study to compliment the effort of the park management in augmenting tiger conservation during January-July 2008. The study found out seven individual tigers that include two males and five females.

Objective

1. Evaluate, monitor and document population of tiger and its prey animals.
2. Assess and document growing tiger-human conflict; design and implement action-oriented conflict reduction measures.
3. Consult, motivate and involve local communities towards long-term conservation of tiger, its prey and habitats.
4. Develop capacity of local wildlife biologist and forest department staff for evaluation and monitoring of tiger and its prey population.

Study area

Orang National Park (92°16' to 92°27' E, 26°29' to 26°40' N) is located in Darrang and Sonitpur districts of Assam (Figure 1) and has an area of 78.80 sq. km (Talukdar and Sarma, 2007). Based on the recent satellite imagery, the wildlife habitat types in Orang can be categorized into the following habitat types-

Habitat types	Area (km ²)
Eastern Himalayan Moist Deciduous Forest	15.85
Eastern Seasonal Swamp Forest	3.28
Eastern Wet Alluvial Grassland	8.33
Savannah Grassland	18.17
Degraded Grassland	10.36
Water body	6.13
Moist Sandy area	2.66
Dry Sandy area	4.02

The Park experiences about 3000 mm of average annual rainfall with 66% to 95% of humidity. It has loamy, sandy loamy and sandy types of soil, and situated at 40 to 70 meter above sea level (Talukdar and Sharma, 1995).

The mighty river Brahmaputra flows through southern boundary of the Park that is crisscrossed by a network of channels connecting the mighty river, particularly during the monsoon. Small tributaries Pachnoi River, Belsiri River and Dhansiri River flow along the boundaries of the Park and ultimately meet the Brahmaputra River. There are twelve wetlands, some of them are already heavily silted and 26 man made water bodies in the Park (Talukdar and Sharma, 1995).

As per the estimation carried out in 2006, the park harbour about 68 Rhino (*Rhinoceros unicornis*) along with sympatric species like – Hog Deer (*Axis porcinus*), Wild Pigs (*Sus scrofa*), Fishing Cat (*Felis viverrina*), Jungle Cat (*Felis chaus*) and Leopard Cat (*Prionailurus bengalensis*).

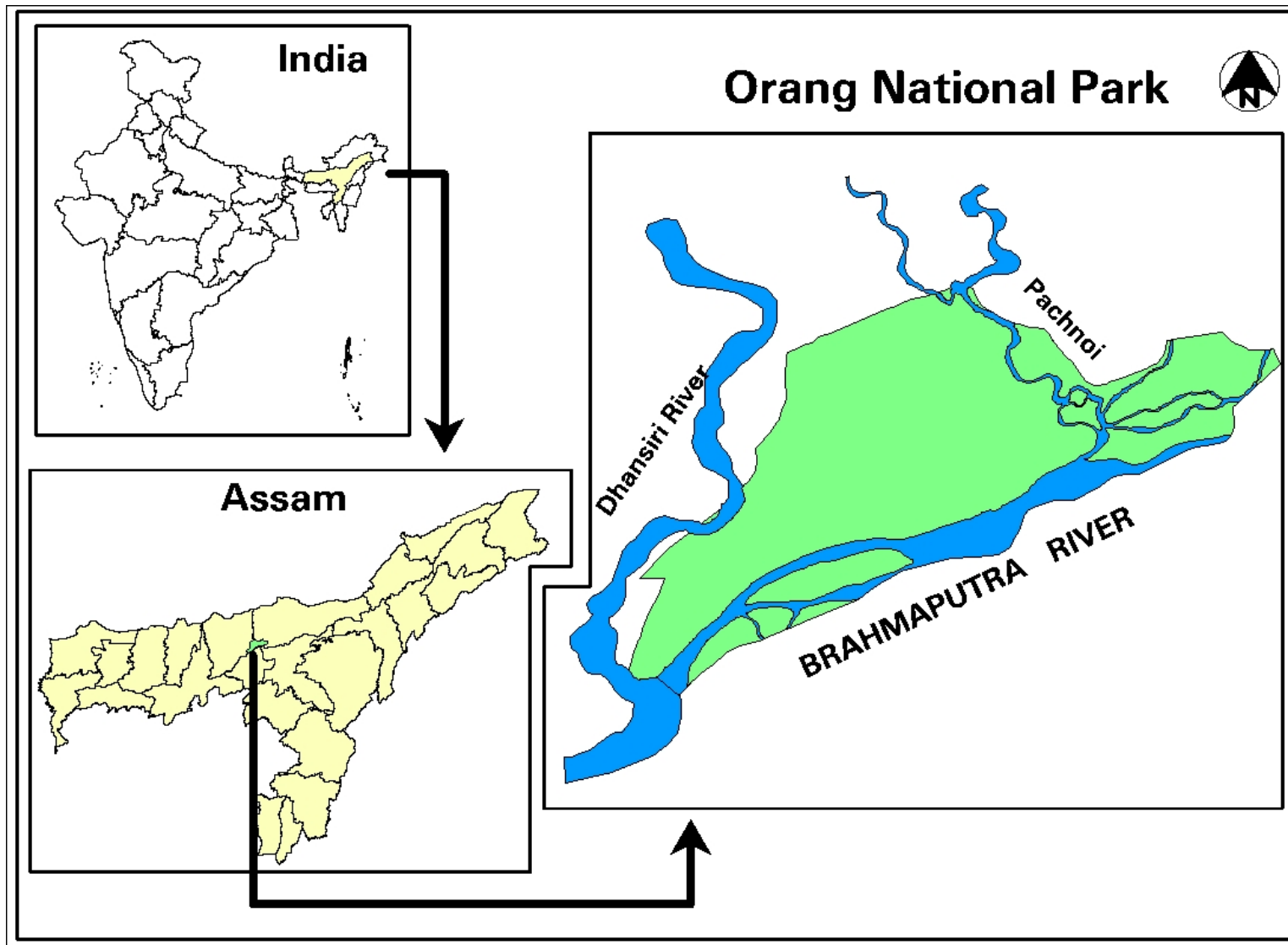


Figure 1: Location map of the study area. (Prepared by: GIS Lab, Aaranyak)

Methods

The following methods were used to achieve the **Objective I (Evaluate, monitor and document population of tiger and its prey animals)** of the study.

Sign Survey

To find out suitable locations for camera traps that are frequented by tigers we carried out sign survey in the park. Though elusive, tigers leave behind signs like pug marks, scat, scrap marks and kills indicating their presence in the area. We recorded all these signs during road transect across the park. Along with tigers, signs of prey and other animals were also recorded during transects. All observations were recorded on standard data sheet (Appendix I).

Camera trapping

Reliable estimation of tiger abundance is challenging because of their elusive behaviour and naturally low density (Simcharoen *et al.*, 2007). The project aims to identify the individual tigers in the Orang National Park and identify all the individual tigers living in the park using camera traps. Tigers are individually identifiable from their stripe patterns (Schaller, 1967; McDougal, 1977; Karanth, 1995; Karanth and Nichols, 2000).

In the months of May and June we started camera-trapping of tigers in the Orang National Park. The camera-trap sites were selected based on the result of the sign survey, i.e. past and present signs of tiger.

At each camera trap location we used one unit of Trailmaster active infra red monitor (model TM1550) with two film cameras (model TM35-1) [Goodson and Associates, Inc., Lenexa, Kansas, USA] facing each other. This is necessary because the stripe pattern of both flanks of a tiger is not symmetrical (Karanth and Nichols, 2000). The camera trapping was carried out continuously for 20 days.



Active Infrared Camera trap Unit



Camera and the sensor unit mounted on wood, while a hog deer being photographed.

The following methods were used to achieve the **Objective II (Assess and document growing tiger-human conflict, and design and implement action oriented conflict reduction measures)** of the study.

Past and recent records of Human-Tiger conflict (killing or injuring human and livestock or straying out in the human habitation) were gathered from the forest department. Further, local communities were consulted in gathering primary information on conflict.

We used the following methods to achieve the **Objective III (Consult, motivate and involve local communities towards long-term conservation of tiger, its prey and habitats)**.

To make the people aware about conservation needs and encourage their participation, motivation meetings were organized with small groups of villagers. Local problems related to wildlife and conservation was discussed in such meetings to instill confidence among the community.

Awareness camps were organized to motivate common people and students about need for wildlife conservation considering tiger and rhino as flagship species. Community Tiger Conservation Unit (CTCU) was established with this objective was meant to generate information on stray of tigers and other animals in the villages and resultant conflict of straying were recorded by the CTCU. These small groups of villagers are also likely to act as the bridge between the forest department and the communities.

We used the following methods to achieve the **Objective IV (Develop capacity of local wildlife biologists and forest department staff in evaluation and monitoring of tiger and its prey population)**.

Capacity Building:

For the purpose of capacity building among local wildlife biologists and forest staff experts were roped in to provide advanced training. Module included in house theory classes and practical work on different techniques to study tigers and prey animals. Biologists for the training were selected based on their interest and academic background. Forest staffs were recommended by the Divisional Forest Officer of respective Protected Areas.

Results

Sign Survey

Sign survey was carried out on roads and trails in Orang National Park and 150 km of road transect were carried out during November-December 2007. The total tiger signs encountered were 108 and overall tiger sign encounter rate was calculated 7.2/10 km. The result summary is given below:

Sl#	Observations	Numbers	Encounter Rate/10 km
1	Tiger scat	43	2.9
2	Tiger scrap	27	1.8
3	Tiger pug mark	38	2.5
4	Rhino sign	126	8.4
5	Hog deer signs	31	2.1
6	Elephant sign	35	2.3
7	Wild boar sign	13	0.9

Camera Trapping

We carried out camera trapping operation in the park from May 25 to June 14, 2008. During the 20 days of camera trapping we used camera traps at 27 trap locations. During the 540 trap-nights we obtained 20 photographs of seven individual tigers that include two males, four females and one individual of unknown sex.

Other than tiger photographs we also have obtained large number of photographs of rhino, hog deer, wild boar, porcupine, large Indian civet, small Indian civet, palm civet, fishing cat, jungle cat and leopard cat, and even birds.

The individual tigers and their pictures are provided as Appendix II

Photographs of other animals are provided in Appendix III.

Prey abundances

The likely prey species of tiger in Orang National Park are Hog deer, Wild pig, and Cattle. We ran altogether 10 Elephant Line Transect and 4 Line Transect on foot to estimate the abundance of the prey species density. The transects covered all the different habitats present in the area viz. Tall Grasslands, Short Grasslands and Mixed Deciduous Forest . We walked on each transect between 0600 to 1000 hr and 1600 to 1900 hr.

Figure 1 shows the relative abundance of the common prey species of tiger encountered during transects. Hog Deer and cattle are the most abundant prey species.

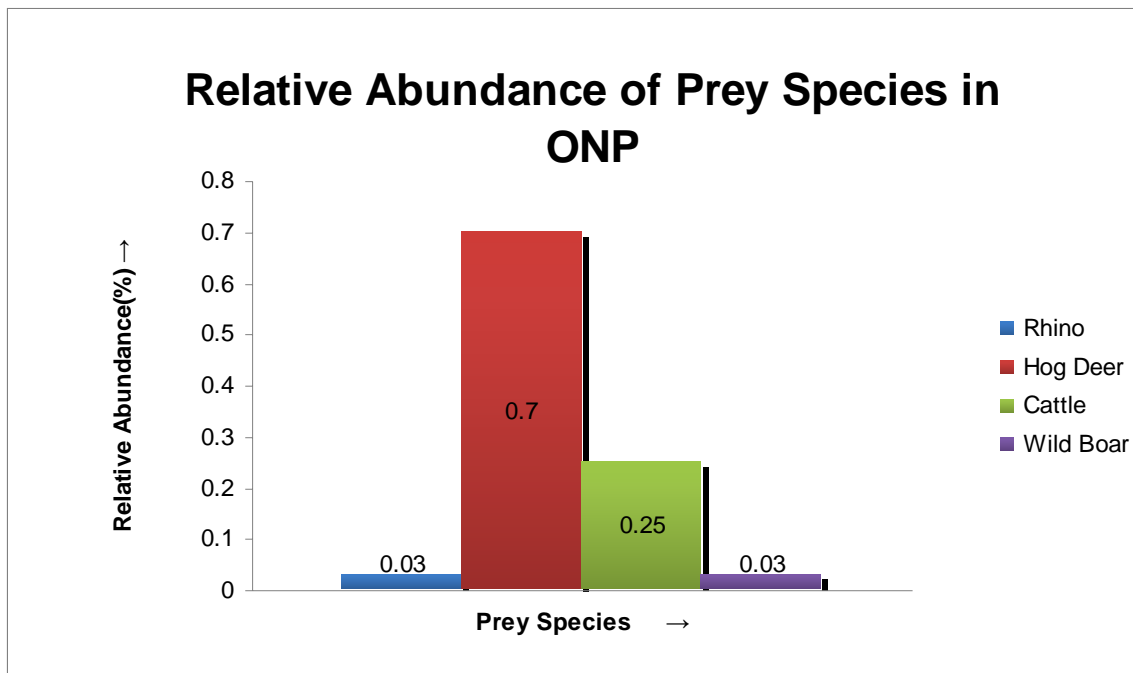


Figure 1. Graph showing relative abundance of prey species in Orang National Park in 2008.

Assessing and documenting tiger-human conflict

Orang can be considered as hotbed for human-tiger conflict as the record proves here. Since 1990, as many as 15 people were killed by tigers around the Orang National Park. This number is considerably high as far as human casualty is concerned. Further, as many as 33 incidences of livestock lifting cases are also recorded around the park since 1993.

Such high level of conflict has taken a heavy toll of tiger in the park as the local community has become hostile towards the animal. As a result, 13 incidences of tiger killings by villagers have been recorded in the park. This is a very high price the tigers have paid for a small conservation area like Orang National Park.

Table 1: Number of people killed by Tiger

Year	# of People killed
1990	3
1997	1
1999	1
2000	3
2001	1
2002	1
2004	1
2005	1
2006	3
Total	15

(Data source: Park Authority)

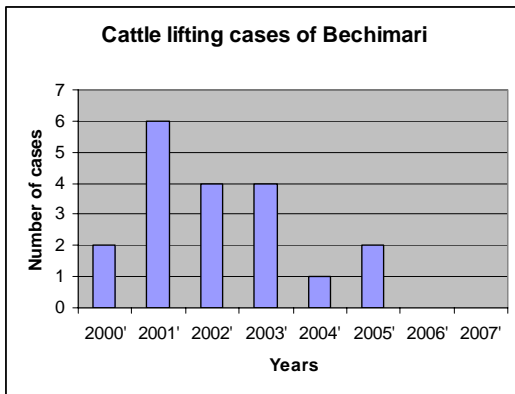
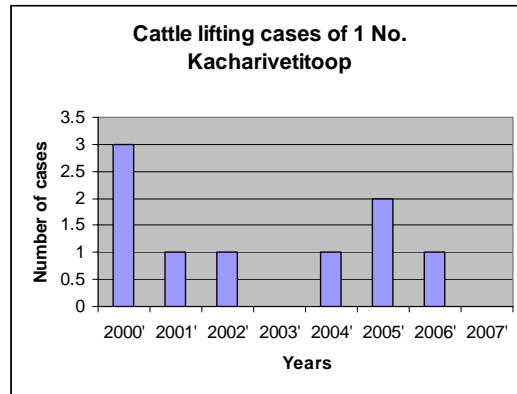
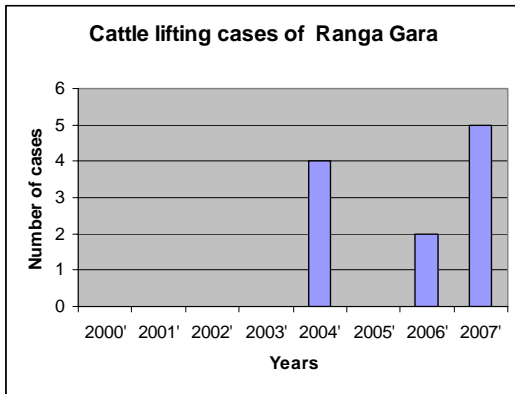
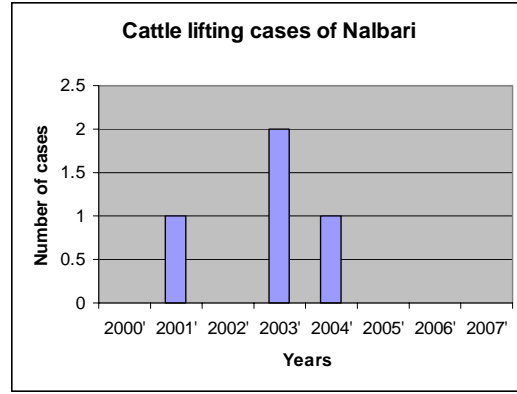
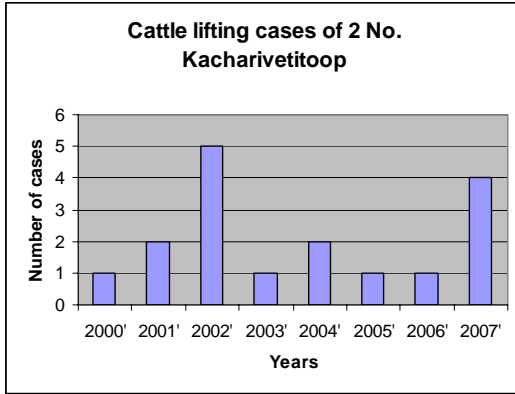
Table 2: Tiger Death Records in Orang National Park.

Sl. No.	Date	Locality	Cause	Sex	Remark
1	19-07-1996	Gariapathar (outside ONP)	Bullet injury	M	8-9 yrs
2	23-02-2000	Bejimari	Poisoning	F	15-16 yrs
3	25-03-2000	Bontapu	Infighting	F	10-12 yrs
4	12-12-2000	Gandarmari	Natural	F cub	7-8 months
5	23-01-2003	Rongagora Village	Suspected Poisoning	F	8 years
6	28-11-2004	Solmari	Natural	F	6-7 yrs
7	26-01-2005	Nislamari	Natural	Cub	--
8	15-11-2005	Bhutiali	Poisoning	M	5-6 yrs
9	14-11-2005	Pachnoi 2	Poisoning	M	8-9 yrs
10	14-02-2006	Gaimari	Infighting	M	3 yrs
11	16-02-2006	Kachomari	Injury on head	F	7-8 yrs
12	06-11-2006	Jahoni (Kathgora)	Poisoning	Cub	2-3 months
13	07-11-2006	Jahoni (Kathgora)	Poisoning	Cub	2-3 months
14	13-11-2006	Jahoni (Kathgora)	Poisoning	Cub	2-3 months
15	13-11-2006	Jahoni (Kathgora)	Poisoning	F	10-12 yrs
16	02-10-2007	Old Orang	Suspected Poisoning	M	2 ½ - 3 yrs
17	04-10-2007	Old Orang	Suspected Poisoning	Unkn own	2 ½ - 3 yrs
18	27-03-2008	Hazarbigha	Suspected Head Injury	F	5-6 yrs

(Data source: Park Authority)

Community based Human-Tiger Conflict Evaluation

Five fringe villages were surveyed involving the CTCUs (Community Tiger Conservation Units) to found out the past cases of tiger depredation in the area. Preliminary result of the survey is shown in the chart below while we analyze the load of data.



Consultation, motivation and awareness

We organized five small group consultations with the local villagers at Silbori, Bechimari Jahoni Island, Belsiri, Rongagora and Kacharivetitooop. Several issues regarding human-tiger and human-wildlife conflict, resource sharing and conservation were discussed during such meeting. In almost all the meetings resentment of the community towards the park management was obvious particularly on resource natural sharing, like thatch collection and grazing of cattle.

Mass education programme

As part of the awareness programme we also organized a 150 km Cycle Rally from Kaziranga National Park to Orang National Park. During the cycle rally from 15-17 November 2007 different educational activities were carried out on the way and around Orang National Park.

The educational activities carried out included street play, interaction, and Audio-visual documentary on wildlife, chorus on nature, mime and recitation.

The cycle rally was organized in collaboration with 18 different organizations and institutions and with support from the local administration.



Cycle Rally from Kaziranga to Orang was flagged off by Shri S N Buhragohai, the Director Kaziranga NP.

Training and Capacity Building

Monitoring Tigers and Prey Animals: Advanced Training for Biologists and Managers.

Duration: 04-07 November 2007

Venue: Orang National Park, Assam, India

The training was organized to impart advanced training on techniques to monitor tigers and prey animals. As many as 13 participants including five biologists and seven forest officials participated in the training.

Dr. Bivash Pandav of WWF International and Mr. Abishek Harihar of Wildlife Institute of India conducted the programme as experts.

The participants were trained in the following topics along with field practice.

- General Introduction: Tiger, its ecology and current status
- Monitoring Tigers and Prey Animals: Concepts of Population Monitoring
- Field Techniques: Theory, Sign Survey for Tiger and Prey Animals
- Distance Sampling and Line Transect Survey
- Capture-recapture Sampling and Camera Trap Survey
- Survey Design
- Practical Exercise: Sign Survey and Camera Trapping
- Other techniques of studying prey animals
- Practical Exercise: Line Transect and Sign Survey
- Camera Trap data collection
- Exercise: Data Analysis



Mr. Abishek Harihar from Wildlife Institute of India demonstrates use of Camera Traps to the trainees.

Participatory Training

Master's student Kamal Azad from North Orissa University participated in the camera trapping operation for two weeks and gained enough experience to choose tiger biology study as his master dissertation topic. Kamal shall be carrying out his field work from January 2009 and the project shall be assisting him in his upcoming study.

Further, Sunit Kumar Das, under graduate student from Mangaldoi College, Assam participated in the camera trapping operation for a week as volunteer. Inspired by the experience, Sunit has decided to pursue his Master in Wildlife Biology and currently studying in the North Orissa University for his Master degree in Wildlife Science.

Conclusion

1. This is the only second extensive camera trapping of tigers in Assam since the study of tiger density carried out in Kaziranga National Park during 1996 (Karanth and Nichols, 2000).
2. The study reveals presence of seven individual tigers including two males and five females in Orang National Park as compared to the earlier estimation made by the forest department using pugmark method (which is known to overestimate the tiger numbers in India).
3. As the camera trapping study was carried out for the first time and for 20 days, it is likely that we might have missed few tigers in the park.
4. Continuous monitoring for three to five years would give a clear understanding on the population dynamics and ecology of the tigers and prey animals in the park.
5. Estimating prey density in alluvial tall grassland has been a challenge for the team as visibility was very low, even from atop the elephant back. The team is in discussion with experts to devise a suitable methodology to suit the study environment.
6. The human-tiger conflict in the park is very high considering the loss of tigers in retaliatory killing by the villagers. Lack of proper mechanism to compensate villagers affected due to conflict with the tiger has aggravated the situation. The study team has put up an effort to urgently introduce a compensation package for the affected villagers.
7. For sensitizing villagers in the need of the hour for long term conservation of the Orang National Park and its wildlife, the awareness campaign initiated by this project should be taken forward to a logical conclusion so that villagers and other stakeholders from around the park participate in holistic conservation of the park.
8. Further, training to forest staff and local biologists will ensure availability of much required manpower to conduct thorough study and estimate the tiger population in the region in the near future.
9. Involvement of villagers in conservation initiatives is the key to long term conservation of the park. Through this programme, we tried to establish community tiger conservation units (CTCU) and involve them in day-to-day monitoring of human-animal conflict. The data generated by three CTCUs are

very large and useful and are being analyzed for proper evaluation. Similar involvement will ensure ownership among the villagers and assist protection and conservation of the park.

10. The tiger population of the Orang National Park seems to be a healthy breeding population. However, lack of proper connectivity of the park to nearby protected area like the Kaziranga Tiger Reserve may be limiting long term conservation of tigers in the park. However, river islands in the Brahmaputra River would act as stepping stones for the tigers in the park to move across tiger habitats in the floodplains allowing an opportunity for genetic exchange with other source population like Kaziranga National Park. Aaranyak, therefore, is evaluating the status of such river islands and evaluate their utility value for movement of tigers out of their small habitat in Orang National Park and mingle with the Kaziranga National Park population across the river Brahmaputra.

Lessons learned

This was the first ever extensive camera trapping operation carried out by the team which has learned a lot from the experience.

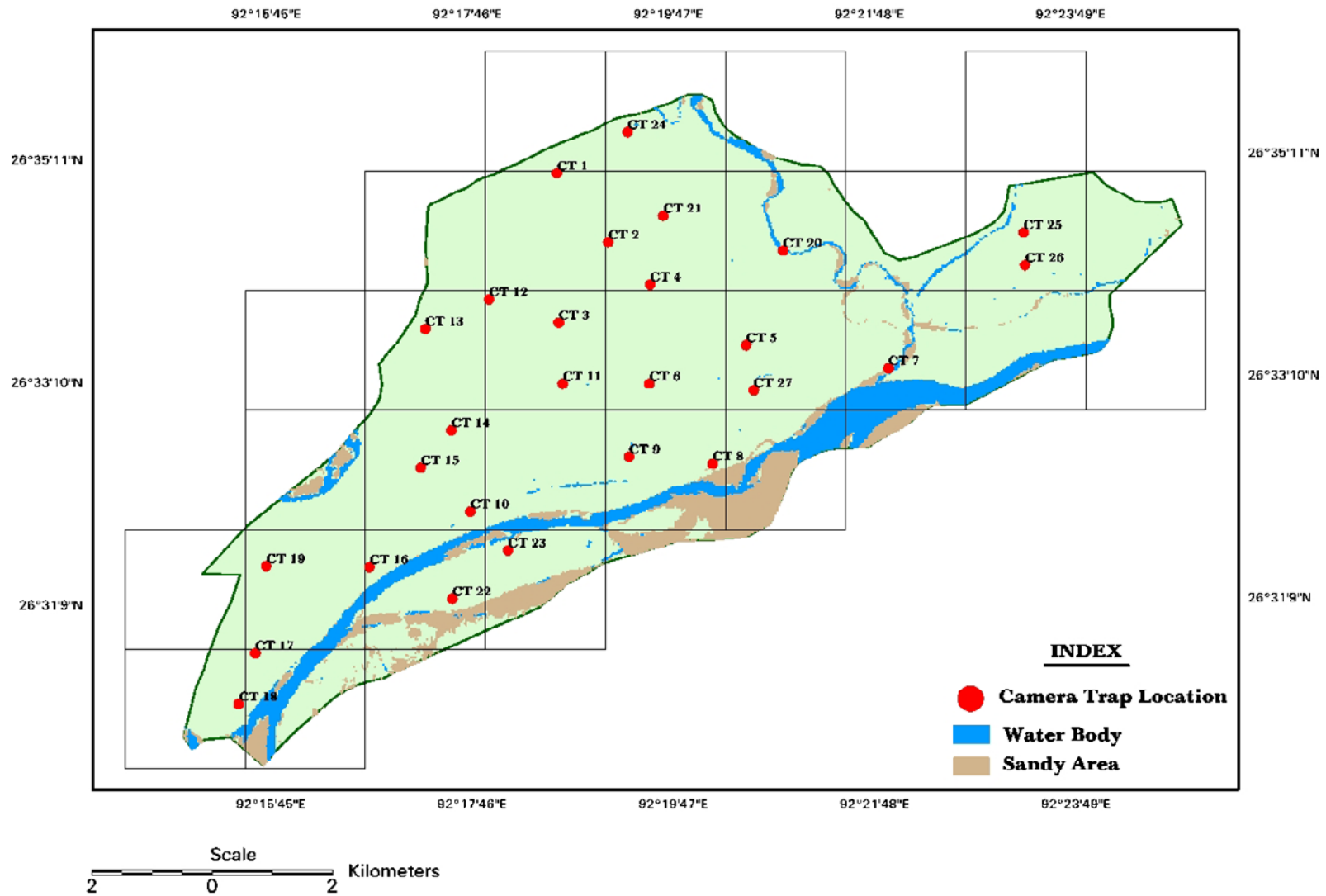
1. The timing of the camera trapping was little late and went into the early monsoon period. This caused frequent malfunction in the camera systems and we had to give extra time to monitor the units every day.
2. We were not well equipped to save the cameras from the elephants and rhino and lost three costly cameras as they were damaged by elephants. We have now built an elephant proof steel caging to protect the system.
3. Insects were menace to our underground cables and as many as 40 costly cables were destroyed by underground tiny devils (ants). We have now decided to lay the cables inside insect proof piping to save thousand of dollars.
4. Carrying out line transects in tall grassland was not suitable for spotting and counting animals even from elephant back. This has prompted us to look for alternative methodology or improvise on the existing one.
5. Working with the communities is a difficult task. The team has learned quite a bit in handling community conservation issues and hopes to improve upon in upcoming session.

What next?

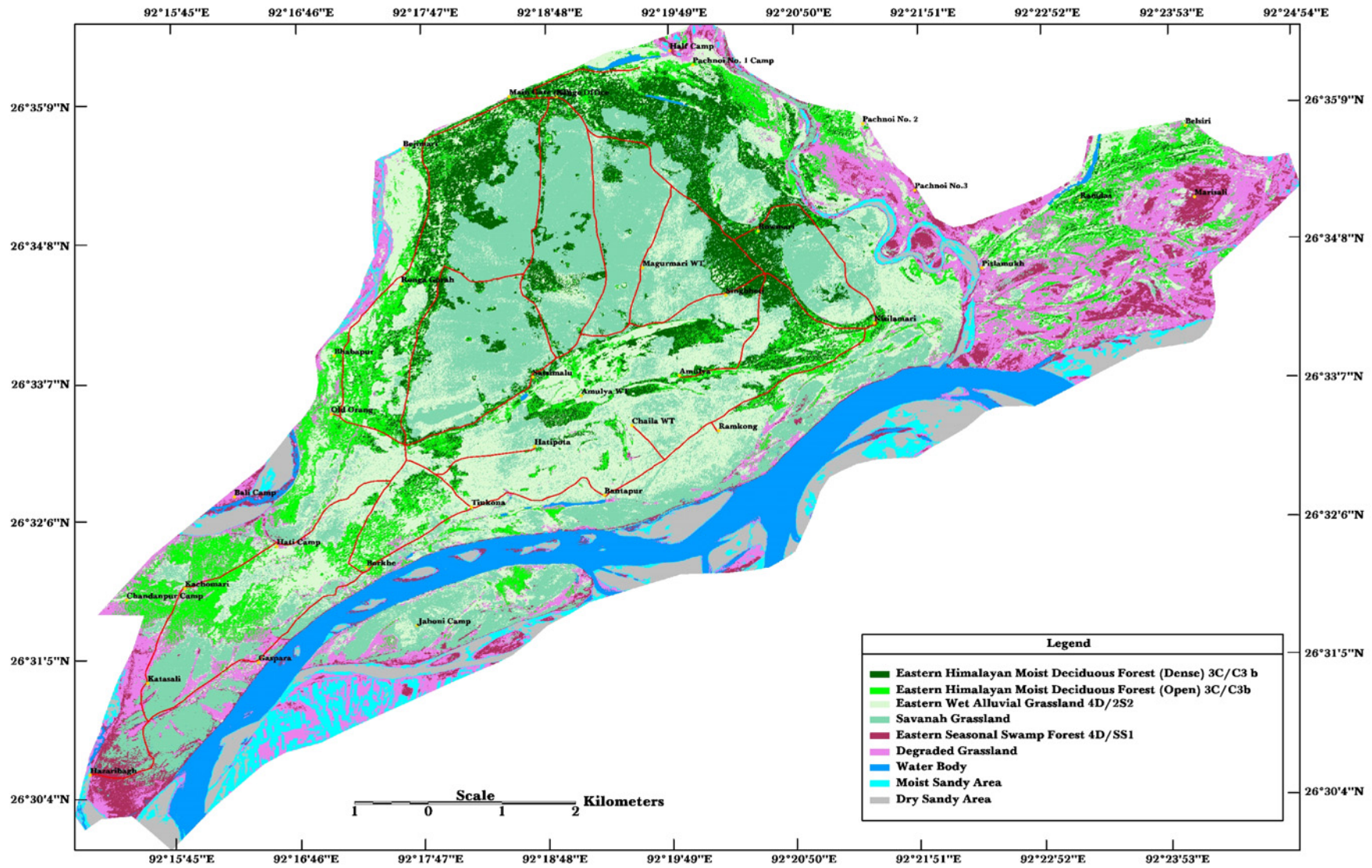
We shall continue the study of population of tigers and their prey animals. We would strive for raising awareness level on conservation need among the community besides trying to find human-tiger conflict resolution. However, to continue this study we would require continued support from the State Forest Department and our donors. We expect continuous support from the SeaWorld Busch Garden Conservation Fund and other donors during the next three to five years that will be required to better understand tiger ecology in the Orang National Park. The support will also help in minimizing human-tiger conflict and improve awareness among the villagers to ensure better conservation of wildlife and the park.

References

- Chambers, R. 1994. Participatory Rural Appraisal (PRA): Analysis of Experience. *World Development* 22 (9), 1253–1268.
- Das, J.P., N.K. Nath, N. Brahma, S. Dey, B.P. Lahkar, P. Devi, R. Barman and B.K. Talukdar. 2007. Conservation and Monitoring of Tiger Population in Manas National Park through Field Techniques and Capacity Building of Local Stakeholder. Conservation Report Series 2007. Aaranyak, pp 33.
- IUCN. 2008. 2008 IUCN Red List of Threatened Species. IUCN, Gland, Switzerland [<http://www.redlist.org>, accessed 24 September. 2008].
- Karanth K. U. 1995. Estimating tiger populations from camera-trap data using capture-recapture models. *Biological Conservation* 71: 333-338.
- Karanth K. U. and J. D. Nichols. 2000. Ecological Status and Conservation of Tigers in India. Final Technical Report to the Division of International Conservation, US Fish and Wildlife Service, Washington DC and Wildlife Conservation Society, New York. Centre for Wildlife Studies, Bangalore, India.
- Karanth K. U. and J. D. Nichols. 2000. Ecological Status and Conservation of Tigers in India. Final Technical Report to the Division of International Conservation, US Fish and Wildlife Service, Washington DC and Wildlife Conservation Society, New York, Centre for Wildlife Studies, Bangalore, India.
- McDougal, C. 1977. *The Face of the Tiger*. University of Chicago Press, Chicago, USA.
- Sanderson, E., J. Forrest, C. Loucks, J. Ginsberg, E. Dinerstein, J. Seidensticker, P. Leimgruber, M. Songer, A. Heydlauff, T. O'Brien, G. Bryia, S. Klenzendorf and E. Wikramanayake. 2006. Setting Priorities for the Conservation and Recovery of Wild Tigers: 2005-2015. The Technical Assessment. WCS, WWF, Smithsonian and NFWF-STF, New York – Washington D.C.
- Schaller, G. B. 1967. *The deer and the tiger*. University of Chicago Press, Chicago, Illinois, USA.
- Simcharoen, S., A. Pattanavibool, K. U. Karanth, J. D. Nichols and N. S. Kumar. 2007. How many tigers *Panthera tigris* are there in Huai Kha Khaeng Wildlife Sanctuary, Thailand? An estimate using photographic capture-recapture sampling. *Oryx*, 41(4): 1-7.
- Talukdar, B. N. and P. Sharma. 1995. Checklist of the birds of Orang Wildlife Sanctuary. 2nd edition. 34 pp.
- Talukdar. 2007. Conservation and Monitoring of Tiger population in Manas National Park through field techniques and capacity building of local stakeholders. Conservation Report Series 2007. Final Project Report under Rufford Small Grant Programme. Published by Aaranyak. 33 pp.



Map of Orang National Park showing camera trap locations (grid size 2 x 2 km).



Map of Orang National Park showing vegetation cover and road network.

Appendix I Datasheet: Tiger/Prey sign Survey



www.aaranyak.org

Data Sheet #

Tiger/Prey Sign Encounter Survey

Orang National Park

Observers: 1.	START- Place: Time: GPS: ° '	Date: Weather: Vegetation Code: Grid ID: Distance walked: km Time Spent- Other Activity: Total Time Spent:
Forest Staff: 1.	END- Place: Time: GPS: ° '	

100 m Segment #

Sl No.	Time	GPS position	Species	Sign Types	Scat Dia (mm)	Scat specimen #/ Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

1. Evidence of Tigers with cubs during the past one month:	Any Evidence _____ Any Cubs _____ Approximate age _____
2. Tigers are known to present in the beat, but no sign was obtained: evidence ascertained	_____ Approximate Date _____

Note/Any other information below and overleaf:

Appendix II
Tigers of Orang National Park



OT-01: Male, caught on camera on 11 June 2008 at Singbheti area.



OT-02: Male, caught on camera on 27 May 2008 at Rahmanpur Road.



OT-03: Female, caught on camera on 9 June 2008 at Magurmari Road.



OT-04: Female, caught on camera on 6 June 2008 at Roumari Beel.



OT-05: Female, caught on camera on 14 June 2008 at Singbheti.



OT-06: Female, caught on camera on 14 June 2008 at Kasomari Camp area.



OT-07: Unknown sex; caught on camera on 8 June 2008 at Jahoni River Island.

Appendix III
Other Animals of Orang National Park caught in camera traps.



Rhino with her calf below



Rhino Calf



Wild tusker



Wild Buffalo



Wild Boar



Hog Deer



Porcupine



Crow pheasant



Owls



Domestic Buffalo



Cattle

Other Photographs Gallery



Forest Staff monitoring camera traps



Acting tiger! Testing a camera trap



Project Investigator monitoring a camera trap



Intern, Kamal Azad learning camera trapping



Team members installing a camera trap



Acting tiger! Project Officer testing a camera trap

Loss of Camera!!



Caught in camera! Wild tusker destroying a camera



Caught in camera! Rhino destroying a camera



Camera damaged by elephant