

**Proceedings of the
Seminars on Human-wildlife Conflicts in West Bengal and
Evaluation of the Biodiversity Research projects under
WBFBCP**

Kolkata 15 June 2017, Siliguri 20 June 2017



**West Bengal Forest and Biodiversity Conservation Project
(WBFBCP)**

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Introduction

WBFBCP has commissioned six research projects to study critical biodiversity issues with a view to develop scientifically robust management solutions. An overarching objective of these studies is to address the human-wildlife conflicts (HWC) which remain a perpetual challenge in the State as it is in most of the wildlife habitats across the country. All the research projects are launched, from one year to three months duration now, and it was thought fit to have structured review of the research works done so far, besides discussing the larger issues in human wildlife conflict management. Thus it was decided to hold a seminar each for North Bengal and South Bengal with the participation of the senior officials of the Forest Department and officers from the field.

I am pleased to present here the proceedings of the two seminars. The following are the research projects underway:

- Ecology of Elephant in South-West Bengal including population dynamics, migratory pattern, feeding habits and human-elephant conflict
- Ecology of Elephant in North Bengal including population dynamics, migratory pattern, feeding habits and human-Elephant conflicts
- Ecology of Gaur in North Bengal including population dynamics, distribution, habitat use pattern, protected area wise carrying capacity estimation and human-gaur conflict.
- The impact of habitat management practices, especially canopy manipulation and grassland restoration, on the habitat use pattern of herbivores and the herbivores-carrying capacity in Jaldapara NP, Gorumara NP and Mahananda WLS
- Leopard ecology in north Bengal including population estimation, population dynamics, distribution, habitat use pattern and human-Leopard conflicts.
- Population dynamics, distribution, breeding behaviour, and predator-prey relationship of Tiger in North Bengal

The seminars had high level participation and had eminently useful deliberations. Apart from reviewing and eliciting course correction recommendations the seminars also provided opportunity for gaining greater insights into the vexing problem of human-wildlife conflicts.

It is hoped that the proceedings will be useful not only to the concerned researchers but also to the larger community of biodiversity managers and researchers.

**PROJECT MANAGEMENT
WBFBC PROJECT**

**Seminar on Human-wildlife Conflicts in South Bengal and Evaluation of the
Elephant Study by SACON**
Aranya Bhawan, Kolkata 15 June 2017

Intent of the Seminar

The daylong seminar on Human-wildlife Conflicts in South Bengal and Evaluation of the Biodiversity Research Studies on ecology of Elephant in South Bengal was organized to disseminate the preliminary findings of the Research Studies and to make course corrections of the studies required, if any.

It was also an opportunity to understand the non-elephant wildlife species that come in conflicts with humans. There are a good number of species involved: Hyena, wolf, jackal, langurs, civet cat, fishing cat, wild boar, bear, snakes etc are the species involved.

Structure of the Seminar

There were three sessions –Inaugural Session and Technical Session-I and Technical Session-II. The Inaugural Sessions included the formal opening of the seminar. This was followed by Technical Sessions comprising Keynote address and Technical Presentations on five research topics, by the research organizations including interactions with the participants.

The Seminar proceedings started with an inaugural session, followed by two technical sessions.

INAUGURAL SESSION

Welcome Note by the Chief Project Director WBFBC Project

The Chief Project Director, WBFBCP welcomed the gathering and briefed on the scope of the seminar. He underlined the importance of the comments and feedback from the officers of the FD especially those from the field. Course corrections if any needed could be made by SACON. He also mentioned it was important to discuss the issues relating to other mammals in South Bengal.

Address by the PCCF, Wildlife & CWLW, W.B.

The PCCF & CWLW mentioned that the SACON study is important especially since no serious long term research studies on the human elephant conflict issue in South Bengal have been done in the past. There was a proposal to declare a Protected Area in the region under the WLPA but that has been shelved. Other conservation programs will be continued in the region.

Inaugural Address by the Principal Secretary Forest Dept & Chairperson WBFBC Society

The Principal Secretary, Forest Department and Chairman of the Society, in his inaugural address, said that the research outputs will provide valuable input to the management interventions in the field, rather than being a mere academic exercise. We need to know about the fodder needs of the Elephant, its behavior patterns etc. in order to have better management practices. He noted that the number of deaths caused by Elephants has

significantly come down this year but even the 31 deaths reported so far are high and must have measures to address this effectively and he hoped that the research input would be important for this.

Address by the PCCF General

The PCCF General noted the past study conducted by Mr. Susanth Chaudhari and a few other technical reports on the subject. It is important to determine the exact food preference of Elephant, like whether or not and to the extend it feeds on Sal bark.

TECHNICAL SESSION-I

Review of the first year of the SACON study on the Ecology of Elephant in South Bengal

In Chair : Shri R.K.Sinha, PCCF, W.L & CWLW, W.B.

Keynote address by the Project Director, Finance, WBFBCP

This session was started with an introduction by the Project Director, Finance of the PMU. This research was part of the six biodiversity research projects under the WBFBCP and the review of the one year research results of the elephant project is important. Copies of the past reports and the current one year report have been sent to the Monitoring and Evaluation Committee he sought the comments on the SACON work in order to be able to further improve the study.

Address by the Biodiversity Conservation Specialist PMC WBFBCP

The Biodiversity Conservation Specialist PMC WBFBCP briefed on the background and scope of the SACON study. He emphasized the circumscribed ecological condition of the area as an elephant habitat and the issues related to interstate elephant movements makes the elephant conflict far more complex in South Bengal than in other parts of the country and the SACON study therefore is crucial in eliciting scientifically robust management information.

Presenter : Dr. Honnavalli Kumara, SACON

Dr. Kumara, SACON, made his presentation on the one year of study, based on the first year report submitted to the PMU. The transect survey in Mayurjharna Elephant Reserve at 15 transects of 2 km length obtained no elephant sightings. He explained the methodology for dung decay analysis and dung pile count to estimate elephant population and it worked out to be 0.508, which is not a reliable estimate, and he explained that the problem was due to the habitat condition of South Bengal where the movement of elephants are not the result of a natural pattern as in other areas. He also explained the development of shape files with forest mapping for two Divisions that they have made and also mentioned the difficulty in obtaining shape files from the FD. He requested to provide the shape files of all the five Divisions of South Bengal.

The analysis of 41 cases of elephant caused deaths was presented- the times of deaths and locations of deaths were discussed. 120 elephants were opportunistically counted, but not analysed. Proposed the need for capture-recapture method for population estimate. The migratory routes of elephants given in the draft report has been removed in the final report as

suggested The Biodiversity Conservation Specialist PMC, as the routes mentioned have to be systematically verified.

Recommendations and decisions

- (i) The presentation was followed by lively discussion. Some key points emerged:
- (ii) The Principal Secretary, FD and the PCCF, WL & CWLW confirmed that the shape files could be shared and asked the officers to share information with the research team, especially regarding elephant depredations as it is in the interest of the FD. The Principal Secretary, FD, has suggested to add the locations of the incidents to the projection of the timing of occurrence of deaths. The OSD, FD, mentioned that the 9-12 am peak of attacks was unlikely and suggested to re-examine, also important to determine how the cases happening in the forests and outside forests.
- (iii) The PCCF, W.L & CWLW suggested the inclusion of all cases in the analysis rather than sample. DFO Midnapur mentioned that most cases of deaths happen due to attacks while on open defecation.
- (iv) The PCCF, W.L & CWLW suggested that the impact of the multiple mitigation measures being taken by the FD should be considered by the research team in formulating new mitigation measures.
- (v) The OSD, FD, mentioned that the season of elephants in Mayurjharna ER may be considered, the movement happen there mostly after the month of July. Besides, transects may be laid in other areas as well as the reserve is 400 km².
- (vi) The Director, SBR, suggested to determine the resident/non-resident status of elephants in each Division. It could also be possible to identify whether the elephants involved in depredations are domestic or migratory.
- (vii) The PCCF General asked the chairman of the Elephant Monitoring Network to add the phone numbers of the SACON researchers onto their network. Similarly they may be connected to the hula parties as well.
- (viii) The CCF/South West Circle suggested to consult a previous PhD study done in the area, there was another study by a geography scholar as well.
- (ix) The DFO Midnapur told of their experience of planting three undergrowth species preferred by Elephants in the Sal forests and this has helped reduce elephant depredations in the area. Similar planting may be undertaken within the WBFBCP.
- (x) The Biodiversity Conservation Specialist, PMC, WBFBCP, pointed out issues in the calculation of dung decay rate, and to methodologically approach the opportunistic sightings to estimate population.
- (xi) Most of the Committee member of the Biodiversity Monitoring Committee were present in the seminar. The mode of presentation had been designed to incorporate the comments made during the presentation as the comments of the evaluation committee. It would be appropriate to issue the proceedings as the deliberations of the committee itself.
- (xii) The PCCF, WL. & CWLW suggested to incorporate the following points for the study of ecology of elephant in south Bengal.
 1. The study team should be given the .shp files of the study area right away. JICA PMU may coordinate with CF, WL (HQ) for the same.
 2. The study may indicate the routes and transit times of elephants in Mayujharna ER.
 3. Sample transects have not covered the whole of Mayujharna ER. Number of sampling transects may be increased.

4. As the dung decay method is not suitable in this study area due to the elephants being driven to combat depredation, either the survey should be done in one day, or collect the census data of the forest dept.
 5. Estimation should be done in all seasons.
 6. The pattern of human deaths should also be analysed for forest / non forest area, type of activity the person was engaged in.
 7. Analyse the existing mitigation measures and their impact.
 8. Recognize and record the resident elephants.
 9. Comments of other committee members may also be sought at the earliest.
- (xiii) *In conclusion, Dr. Kumara, SACON, offered to take on board the constructive suggestions.*

TECHNICAL SESSION II

Open Discussion on Wildlife Management Issues in S Bengal

In Chair : Dr. R.P.Saini, IFS, Director, SBR

The discussion was on the non-elephant wildlife species that come in conflicts with humans. There are a good number of species involved: Hyena, wolf, jackal, langurs, civet cat, fishing cat, wild boar, bear, snakes etc are the species involved. The chair mentioned that there are several species involved and the capacity for managing the conflicts are limited and this needs to be improved. The floor was opened for officers from the field.

Several officers mentioned the need for following the calendar of tribal traditional hunting to curb the illegal hunting. The key points emerged and the recommendations are as follows:

- (i) The DFO, Purulia , mentioned that hyena is the main problem there, detection of hyena carcasses has confirmed the presence of the species in the Division. Bear is found in certain pockets in the Division and attack occasionally although these cases are not much publicized as the people have a tolerant view towards the animals. Jackal and wolf are also problem here.
- (ii) *There was consensus on the need to study the mammals of S Bengal and it was suggested that a proposal may be submitted to PMU for funding from the WBFBCP under its contingency. The Addl. PCCF/ Wildlife was asked to prepare the proposal. The Director, SBR, WB mentioned about a discussion he had with ZSI on a small mammals study in S Bengal.*
- (iii) The Principal Secretary, FD, has clarified that wild boar depredations can be compensated. The CCF/ Western Circle called for the proper control of NGOs if and when their services are used. The DFO, South has mentioned that langur, civet cat, etc. are the main problems there. The rhesus problem there is escalating. The reintroduced population of spotted deer in Bankura has now grown to 500 animals, after 20 years.
- (iv) *The CPD PMU explained the funds being provided for addressing the small mammals conflicts under the project, and called on the DFOs to utilize the same.*
- (v) *It was suggested to prepare and publish a booklet/manual on how to tackle the animal conflicts under WBFBCP.*
- (vi) The chair called for the suggestions for the revision of the calendar. He also called for further capacity building of the staff by utilizing the funds currently available.
- (vii) The OSD, FD, complimented PMU for organizing such a discussion and called for a rapid assessment of the populations of the small mammals.

- (viii) The Biodiversity Conservation Specialist PMC informed of the provisions under which support is provided under the project. He proposed a vote of thanks.

The chair announced the conclusion of the seminar.



Sectional view of Seminar held at Aranya Bhawan on 15th June, 2017

Seminar on Human-wildlife Conflicts in North Bengal and Evaluation of the Biodiversity Research Studies

Hotel Sinclair, Siliguri, 20 June 2017

Intent of the Seminar

The daylong seminar on Human-wildlife Conflicts in North Bengal and Evaluation of the Biodiversity Research Studies was organized to disseminate the preliminary findings of the Research Studies and to make course corrections of the studies required, if any. It was also an opportunity to understand the situation of Human-wildlife conflicts prevalent in North Bengal and to try to ameliorate the same to the extent possible.

Structure of the Seminar

There were two sessions –Inaugural Session and Technical Session. The Inaugural Session included the formal opening of the seminar. This was followed by Technical Sessions comprising Keynote address and Technical Presentations on five research topics, by the research organizations including interactions with the participants.

INAUGURAL SESSION

Introduction by Project Director Finance, WBFBC Project

The Project Director, Finance, WBFBCP, introduced the context and format of the seminar. He clarified that the technical sessions comprise of:

- (i) Presentations by *Aranyak* on the six months progress of their studies on Elephant and Gaur,
- (ii) Presentation by *NEWS* on the newly started study on the habitat management interventions.
- (iii) Presentation on studies on Tiger and Leopard that is at the inception by *Aranyak*.

Welcome Note by the Chief Project Director WBFBC Project

The CPD PMU welcomed the participants and briefed on the background of the research projects. He sought the comments and inputs of the audience to further improve the research studies.

Address by the PCCF General

The PCCF General underlined that the research studies under the project should not be a pure academic pursuit, instead it should be able to provide sound management prescriptions for addressing the problems at hand. Among the study objectives of each research project, the management plan preparation is the most important part. He urged that the study reports, when finalized, should be shared with the field officers so that they can make use of it in management of wildlife.

Address by PCCF Wildlife & CWLW

The PCCF WL & CWLW, recalled that the ToRs of the studies were developed in line with the research needs of the Wildlife Wing and the data generated are expected to serve management purpose. The seminar would be able to assess the progress of the studies and help making course corrections if needed.

Inaugural Address by the Principal Secretary Forest Dept & Chairperson WBFBC Society

The Principal Secretary, FD, in his inaugural address, called for filling the gap between the academic pursuits and administration, as it is a gap ‘created and nourished by both on the perception that both are separate’. The studies should not end with surveys only, akin to numerous surveys conducted in the past, but should be able to provide recommendations for feasible interventions for biodiversity management. The research studies should remain focused, answering specific questions. He called for creative discussion on the ensuing presentations.

Vote of Thanks

Dr K.L. Ghosh, Project Director (M&E), WBFBC Project thanked all the participants, including the Principal Secretary, Forest Dept., the PCCF General, the OSD Forest Dept., all the Circles in charge, the Heads of DMUs and their officers for attending the seminar and hoped that valuable inputs would be obtained from them.

TECHNICAL SESSIONS

Keynote address

Dr P.Vyas, OSD Forest Dept. delivered a keynote address. He reminded of the loss of several species in North Bengal in the recent past. It was mentioned that all species involved in conflicts across the country, except Nilgai, are present in North Bengal and the challenges of management are huge. Bengal has only 4% of the country's Elephant population but has about 40% of the human deaths due to elephant attacks. Gaur, which once had a population of 600-700 has now become 5000-6000 posing management challenges. It is also interesting to note that the Leopard is moving out to the tea estates and forest fringes and not into the grasslands. The fate of the tigers once present in Gorumara and Jaladapara is known. He expressed that the studies may assess the ongoing management practices and provide recommendations to modifications, if any needed. He expressed the hope that the research works would meet the management information needs in their respective subjects.

Technical Presentation I

Evaluation of Progress Report of Aaranyak on research project of Ecology of Elephant in N-Bengal

In Chair : Shri R.K.Sinha, PCCF, W.L & CWLW, W.B.

Presenter : Dr Jyoti Das of Aaranyak

Presentation on the six months progress report — October 2016 to March 2017 — was made on research project on Ecology of Elephant (*Elephas maximus*) in North Bengal including population dynamics, migratory pattern, feeding habits and human-Elephant conflicts.

One quarterly report and one half yearly report have been submitted by the Research organization so far.

Important points presented:

- (i) Survey for elephant's presence/absence was done in all the 234 grids (2 x 2 meters) laid out, by direct observation and interviews with the people.
- (ii) Elephant's presence was found in 200 out of 234 grids.
- (iii) Transects were set for distance sampling method survey and for dung pile study. 650km vehicle surveys were also done.
- (iv) 14 fresh dung piles were marked in Buxa. 179 elephants were sighted on 20 occasions, with herd size ranging from 1 to 65.
- (v) Training were imparted on elephant census by Aranyak to FD staff, for conducting the recently done all India elephant survey and participated in the survey itself.
- (vi) There were 76 cases of human elephant conflicts and two cases of human deaths due to elephant attacks. The presenter outlined the work they propose to do in the next 6 months.
- (vii) Support of the Wildlife Wing was requested for permission to stay in unused quarters or such places inside the parks in order to be able to start observations early in the mornings. Access to information/records held by the FD offices and accompaniment of forest guards to during field visits was requested.

The presentation generated a lively discussion.

Recommendations and decisions

- (i) The PCCF, W.L & CWLW, W.B. suggested to focus on conflict and mitigation issues. He also mentioned the need to identify family groups and build dossiers on them.
- (ii) The OSD, F.D. raised the question of the utility doing population estimation when the recently conducted national elephant census provides data on total counts of elephants.
- (iii) Several participants questioned the low number of human causalities (2 deaths) while there were 20 reported deaths in the study area during the period of study. To mitigate such gaps in information, the PCCF, General, called on the colleagues to provide the necessary support to the researchers, especially access to information.
- (iv) The C.F. W.L. North pointed out the need to explore the correlation between fodder availability and elephant-human conflicts.
- (v) The Director, SBR, opined that the framework of the study was good. They need to analyse the causes for the elephant attacks.
- (vi) On using the local youth group for information gathering on elephant movement, ADFO Jaldapara suggested to ask them to send photographs with geo-reference which would be reasonably authentic.

- (vii) The Biodiversity Conservation Specialist, PMC, WBFBCP called upon them not to lose sight of the final objective which is the management plan. It was suggested that the method used by SACON study in S Bengal to do the analysis of conflicts may be studied.
- (viii) *The PCCF, General, suggested and the PCCF, W.L & CWLW agreed that the researchers be given identity cards with photographs so that they can have better access to the field staff.*
- (ix) The CF, W.L. HQ offered to provide data on conflicts available with the WL HQ. It was suggested by him that Aaranyak may provide a nodal officer who would collect data from WL HQ, since this data is compiled every day.
- (x) *The PCCF, WL & CWLW offered to provide facilities of staff quarters subject to availability and directed the CF WL (North) to follow up on this.*

Technical Presentation II

Evaluation of Progress Report of Aaranyak on research project of Ecology of Gaur in N-Bengal

In Chair : Shri R.K.Sinha, PCCF, W.L & CWLW, W.B.

Presenter : Dr Bibhuti Prasad Lahkar of Aaranyak

Presentation was made based on one quarterly report and one half yearly report submitted so far. The preliminary findings of Ecology of Gaur (*Bos gaurus*) in North Bengal including population dynamics, distribution, habitat use pattern, protected area wise carrying capacity estimation and human-gaur conflict was presented.

Important points presented:

- (i) The methodology and site selection for the study was explained. It was declared that 34 transect lines were set in the grids selected in various habitats within the study area. 10 m x 10m plots were used for vegetation study.
- (ii) 78 Gaurs were sighted in 12 herds, of 1-18 herd sizes.
- (iii) 45 vegetation plots were set and vegetation analysis initiated. Six species of plants have been identified as preferred food.
- (iv) 14 cases of conflicts and two cases of deaths of Gaurs were noticed. He also outlined the study plan for the next six months.
- (v) The presenter raised the same logistic issues as in the case of elephants.

This was followed by detailed discussion by the participants.

Recommendations and decisions

- (i) The OSD, FD, commented that all the past data on Gaur are available with the FD offices and suggested the researchers to collect these, though the data has to be sifted out from the files.
- (ii) The PCCF, WL & CWLW also suggested to collect the old data available in the FD offices and asked the officers to give access to the researchers to the old information.
- (iii) The Biodiversity Conservation Specialist, PMC, WBFBCP suggested that the vehicle count data cannot be used for deriving population density.

- (iv) It was commented that herds were seen up to sizes of 70 but why was it that the reported herd sizes extend upto 18 only. Dr Bibhuti Prasad Lahakar explained that this is probably due to the time of observation. The researchers cannot camp in the forests and as such they don't get to observe the animals in the early morning, which is very important for the purpose of wildlife study. He reiterated the request for allowing the researchers to reside inside forest area.
- (v) The Director, SBR suggested to choose sites for intensive observations on a zonal basis as there is considerable ecological variation within the study area.

Technical Presentation III

Evaluation of Inception Report of NEWS on research project of Impact of habitat interventions.

In Chair : **Shri R.K.Sinha, PCCF, W.L & CWLW, W.B.**

Presenter : Dr.Himadri Sekhar Debnath of NEWS

Dr Debnath of NEWS presented the inception report on the study. The impact of habitat management practices, especially canopy manipulation and grassland restoration, on the habitat use pattern of herbivores and the herbivores-carrying capacity in Jaldapara NP, Gorumara NP and Mahananda WLS. The research organization has made two months' field and desk study and presented an Inception Report.

Important points presented:

- (i) GIS maps for the study area with vegetation coverage and methodology for the inventorisation of the fauna, flora and microhabitats have been developed.
- (ii) Data on animal counts in a couple of beats obtained from the forest offices were presented.
- (iii) Some areas for new planting have been identified, it was recommended to fell old plantations of teak and reforestation of the area with the natural vegetation. The presentation was followed by discussion.
- (iv) Plant samples have been collected for identification as a preliminary step toward Habitat Management Study.
- (v) Preliminary field observations from two field trips include 300-400 snag trees in Jaldapara WLS, which is absent in Gorumara and Mahananda WLS. Also there has been landscape changes along Siltorsa river.
- (vi) Teak and Jarul occupy about 34% total plantation in PAs.
- (vii) Most preferred, Preferred and Stress time fodders need to be identified.

Recommendations and decisions

- (i) The OSD, FD pointed out that the objective of the study was to assess the impact of the past management interventions and not a new ecological study of grassland or floral study. The PCCF, WL & CWLW also confirmed this.
- (ii) The Director, SBR suggested to obtain data from the FD records.
- (iii) The Biodiversity Conservation Specialist, PMC, WBFBCP suggested the team to develop the methodology for studying the impact of past interventions in the PAs, to assess the herbivore carrying capacity of the PAs and to assess the weed distribution. It is too early to make conclusive statements based on preliminary observations.

Technical Presentation IV

Evaluation of Progress of work by Aaranyak on research project of Ecology of Tiger in N-Bengal

In Chair : Dr P.Vyas, OSD Forest Dept., Govt of West Bengal

Presenter : Dr U.Borthakur of Aranyak

A presentation was made on the methodology and timeline for research activities of the study titled *Population dynamics, distribution, breeding behaviour, and predator-prey relationship of Tiger (Panthera tigris) in North Bengal*. The formalities of tender and work order have been concluded recently and field works are yet to take off.

Important points presented:

- (i) The project is based on a two phase study design. Phase I includes mapping of tiger presence and distribution in the PA network of North Bengal using sign survey and genetic sampling based species identification of genuine tiger samples.
- (ii) Phase II covers population estimation using Genetic capture-recapture in a single session, as well as Photographic capture-recapture in the second year.
- (iii) Annual tiger density will be calculated using information about area sampled and the maximum distance moved by individual Tigers based on locations of samples.
- (iv) Prey abundance estimation using line transects and distance sampling as well as dietary habit analysis by analysis of prey hair from tiger scats will be conducted in order to understand the prey-predator relationships. In addition, the demographic and genetic exchange in tigers of North Bengal will also be inferred from microsatellite allelic data.
- (v) Zones will be stratified. Normally 4 x 4 kms grids will be fixed for field study, but 2 x 2 kms grid will be used for refractory sites.
- (vi) *The Inception Report will be submitted in late June and the project work will be started in September 2017.*

Recommendations and decisions

- (i) In the ensuing discussion The Director, SBR, pointed out to exclude Coochbehar district from the study and include Kalimpong district instead. Accordingly, Neora Valley and Singalila NP will be included.

- (ii) The Field Director Buxa Tiger Reserve requested the cooperation of the Aranyak team in the new Tiger census and Aranyak agreed to cooperate.
- (iii) The scats will be looked for in the trails and on the river banks 4-5 people will walk in parallel looking for scats.
- (iv) The findings may be expressed in plain English, without invoking much statistical jargons.

Technical Presentation V

Evaluation of Progress of work by Aaranyak on research project of Ecology of Leopard in N-Bengal

In Chair : Dr P.Vyas, OSD Forest Dept., Govt of West Bengal

Presenter : Dr U.Borthakur of Aranyak

A presentation was made on the planned study titled *Leopard (Panthera pardus) ecology in North Bengal including population estimation, population dynamics, distribution, habitat use pattern and human-Leopard conflicts*. The formalities of tender and work order have been concluded recently and field works are yet to take off. Therefore the presentation was made on the methodology and work plan for the research work.

Important points presented:

- (i) The project follows a two phase design. In the first phase it focuses on a grid based survey of leopard presence through questionnaire, sign survey and genetic sampling as well as assessment of human-leopard conflict intensities through questionnaire and secondary information collection.
- (ii) Both the presence of leopards and human-leopard conflict intensities will be mapped in a GIS platform.
- (iii) In phase two, leopard population size will be estimated in select intensive study areas, using genetic capture-recapture and further validation by photographic capture-recapture analysis.
- (iv) Leopard density will be calculated using information about area sampled and the maximum distance moved by individual leopards based on locations of samples.
- (v) Further, estimation of prey abundance in mapped leopard habitats and scat hair analysis based quantification of prey species composition in leopard diet will be carried out, in order to understand dietary preference of the species.
- (vi) The reproductive analyses will also be done to the extent possible.
- (vii) *The inception report will be presented in end of June and the work will commence in September, 2017.*

Recommendations and decisions

- (i) The OSD, FD and the PCCF, General questioned the need for the objective of the study of reproductive behaviour even as an opportunistic one, as it could consume a lot of the research time. The Biodiversity Conservation Specialist, PMC, WBFBCP suggested to drop this objective.
- (ii) The C.F. WL, North suggested to do the change analyses of landscape for finding the human-leopard conflict factors. She pointed out now leopards are moving into the rural

landscape rather than tea garden, partly because tea plantations are not being maintained as done previously.

- (iii) The OSD, FD asked requested to throw light on the intensity of camera traps. However, Dr Borthakur said it was not possible to specify at this stage. At the best, it could be stated that at least one camera trap per grid will be placed.

The Chair concluded the session thereafter.

Summing up of the Technical Sessions

The Biodiversity Conservation Specialist of PMC, WBFBCP summed up the outcome of the deliberation of all the technical sessions.

- The deliberations have elicited valuable inputs to improve the quality of the research projects and the researchers could test the robustness of their methods and early findings.
- The importance of management focus of the studies was repeatedly underlined and the researchers are quite informed of it.
- As the recently conducted national elephant census provides data on total counts of elephants, if the researchers could acquire the census data, area wise, for the study area the population estimation objective of the study may be dropped from the elephant study. However, PA/range wise data on population data of elephant is important and Aaranyak may inform the PMU if and when they have succeeded in obtaining this data from the FD when the PMU may permit them to drop the population estimation objective.
- The researchers may collect past data on Gaur from the DFO offices and develop a protocol for standardizing the data thus collected, informed by the variations in data collection at the beat level in various places.
- Emphasis was laid on the studying the impact of the past interventions in the NEWS study so as to be able to develop new management prescriptions based on past failures and successes. Emphasis was given to developing the methodology for studying the impact of past interventions in the PAs, to assess the herbivore carrying capacity of the land to assess the weed distribution.
- Since the reproductive behavior study of Leopard, even on an opportunistic basis, would demand undue share of the field time and since it has no significant practical utility, this objective may be dropped from the study.
- It was agreed that the researchers be given identity cards with photographs so that they can have better access to the field staff.
- It was agreed to provide quarters facilities to the researchers subject to availability in or in the proximity of PAs for the ease of field observations.

The conclusion of the seminar was announced thereafter.



Sectional view of Seminar held at Hotel Sinclairs, Siliguri on 20th June, 2017

List of participants of the Kolkata Seminar

SL No	Name of Participant	Designation
1	Shri. C. Sinha, IAS	Principal Secretary , Forest Department, Govt of West Bengal
2	Shri. P. Shukla, IFS	PCCF (HOFF), WB
3	Shri. D. Biswas, IFS	PCCF, Research, Monitoring and development
4	Shri. N.K.Pandey, IFS	PCCF, General, WB
5	Shri, S. Barari, IFS	PCCF & Chief Project Director, West Bengal Forest and Biodiversity Conservation Project
6	Shri. P. Vyas, IFS	OSD, Forest Department, West Bengal
7	Shri. Ravi Kant Sinha, IFS	PCCF & CWLW, WB
8	DR. R.P.Saini, IFS	Director, Sundarban Biosphere Reserve
9	Shri. S. Chaudhuri, IFS	CCF & Project Director (Finance), West Bengal Forest and Biodiversity Conservation Project
10	Dr. K. L. Ghosh, IFS	CCF & Project Director (M & E), West Bengal Forest and Biodiversity Conservation Project
11	Smt. S. Bhattacharyya, IFS	CF & Addl. Project Director (Implementation), West Bengal Forest and Biodiversity Conservation Project
12	Shri. S. Sengupta, IFS	CF, WL HQ
13	Dr. S. Faizi	Biodiversity Conservation Specialist (PMC) West Bengal Forest and Biodiversity Conservation Project
14	Dr M Kumara	Principal Scientist, SACON

List of Participants of the Siliguri Seminar

SL No	Name of Participants	Designation
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2	Shri. P. Shukla, IFS	PCCF (HOFF), WB
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7	Shri. Ravi Kant Sinha, IFS	PCCF & CWLW, WB
8	DR. R.P.Saini, IFS	Director, SBR
9	Shri. L.G.Lepcha, IFS	General Manager (North)WBFDC
10	Shri, M.R.Baloch, IFS	APCCF, North Bengal
11	Shri. S. Sundriyal, IFS	APCCF, Wildlife
12	Shri. S. Chaudhuri, IFS	CCF & Project Director (Finance), WBFBC Project
13	Dr. K. L. Ghosh, IFS	CCF & Project Director (M & E), WBFBC Project
14	Shri. N.S.Murli, IFS	CCF, Wildlife North

15	Shri. U. Ghosh, IFS	CCF, Northern Circle
16	Smt. S. Ghatak, IFS	CF, Wildlife North
17	Shri. S. Sengupta, IFS	CF, WL HQ
18	Smt. S. Bhattacharyya, IFS	CF & Addl. Project Director (Implementation WBFBC Project)
19	Smt. Umarani, IFS	DFO, Baikunthapur DMU
20	Shri. B. Sarkar, IFS	DFO, Jalpaiguri DMU
21	Dr. Jyoti Das	AARANYAK, Assam
22	Shri. Udayan Borthakur	Head, Wildlife Genetics Division AARANYAK
23	Shri. Biswajit Roy Chowdhuri	Secretary, Nature Environment & Wildlife Society (NEWS)
24	DR. H.S. Debnath	NEWS
25	Smt. Ranjana Saha	NEWS
26	Dr. S. Faizi	Biodiversity Conservation Specialist (PMC), WBFBC Project
27	Shri. Bibhuti Prasad Lahkar	AARANYAK
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29	Shri. Samir Gajmer	DFO, Monitoring North
30	Shri. Mridul Kunor	ACF, Baikunthapur
31	Shri. D. Mallick	CF, North West
32	Shri. Kunal Kumar Banarjee	DFO, JPGS Forest Division
33	Shri. D.K. Dutta	DFO, Raiganj
34	Shri. A. Sarkar	DFO, Malda, DMU
35	Shri. A.K.Chaki	ADFO, Silviculture North
36	Shri. M.Tirkey, WBFS	ADFO, Raiganj
37	Smt. Debangana Choudhury	Accountant, Raiganj, DMU
38	Shri. Badal Debnath	ADFO, CWLD
39	Shri. D.S. Sherpa	DFO, SSFD
40	Shri. Bimal Debnath	AWLW, Jaldapara
41	Shri. Deepak. M	ACF, Jalpaiguri
42	Dr. Anurag Chowdhury	ACF, Jalpaiguri
43	Shri. Ajay Kumar Dubey, IFS	DFO, Silviculture North