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Official review of the thesis

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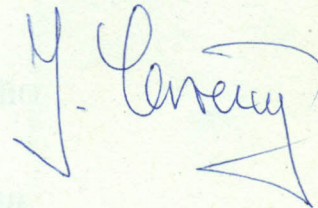
**Challenges of Bengal tiger (*Panthera tigris tigris*) conservation in tropics: lessons learned
from the Chitwan National Park of Nepal**

The PhD. Thesis deals with different aspects of conservation of the bengal tiger and biodiversity in the Nepal, mainly in the Chitwan national park. The main objectives of this study were: interaction between bengal tiger and leopard, habitat heterogeneity and habitat preference of the prey of tiger, impact and effects of human disturbance on the prey and habitat, factors affecting population structure and social organization of the wild ungulates, impact of livestock grazing on the vegetation and wild ungulates. Also distribution and diversity of storks were included into the PhD Thesis. This Thesis consists of general part (introduction; scope of thesis; summaries of methods, results and discussion; general conclusions; conservation implications; references) and special part. Special part represents the most important component of the Thesis and it is created by nine papers, which are published or submitted. It means that absolute level of contributions was confirmed by the independent reviewers and it is not necessary to do it once again by me. The results of the PhD. Thesis extend the knowledge about the conservation of bengal tiger and biodiversity of the Nepal as well as the interactions between the predators, habitat, prey species

and human activities. It is a very good example of modern integrated investigation of the predator's importance in the ecosystems.

Remarks and questions: ungulates are very important component of the diet of predators investigated. But play some role in the diet also some smaller mammals (f.i. rodents, hares) or birds? How is it with poaching of bengal tiger (and leopard) and their prey in Nepal?

I consider the PhD. Thesis to be very good and recommend it to defence.



20.4.2012

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Review on the Ph.D. Thesis submitted by

Bishnu Prasad Bhattarai, MSc.

„Challenges of Bengal tiger (*Panthera tigris tigris*) conservation in the tropics:
lessons learned from the Chitwan National Park of Nepal“

This thesis describes the challenges of the conservation of tiger (*Panthera tigris tigris*) in the Chitwan National Park of Nepal and is supposed to be a model for tiger conservation in the tropical areas of other tiger range countries. The thesis has also been a challenge for reviewing because it represents hundreds of pages mostly pressed in small fonts with a single space between the lines. It would help if there was some unified pagination across the thesis containing published as well as new text. (For example: In the Summary of Methods, the author refers to the method of the habitat classification saying it is shown in “Fig. 1a, Table 1 in paper III”. The paper III starts approximately on the page 140 of the thesis, and the figure is on the page 34 of the paper, which is approximately the page 180 of the thesis. Though, I have to admit that such a reference is luckily rare throughout the thesis.)

The thesis is based on 32 pages of general introduction (divided into General introduction, Scope of the thesis, Summary of methods, Summary of results and discussion, General conclusions, Conservation implications and References containing 96 citations) and nine parts in the form of either published papers or manuscripts. The General Introduction brings clearly arranged overview of the thesis. The main body of the thesis has nine parts in the form of either published papers or manuscripts. These parts deal with the status of the protected areas of Nepal, and the challenges faced by the government to protect them; the overview of the biodiversity of Nepal, including the eco-regional distribution of the flora and fauna in different physiographical regions of the country; the consequences of the interactions between two sympatric carnivores: tiger and leopard; the abundance and habitat preference of the prey species; with the impact of human disturbance on prey species of tiger and leopard; the population structure and social organization of the wild ungulates; the effect of human disturbance on the habitat and prey preference of the tiger; the impact of livestock grazing on the vegetation and wild ungulates; and finally with the distribution and diversity of storks as small part of the diet of tiger and leopard. It is an interesting reading bringing complex information about the status of nature biodiversity in Nepal, suggesting reasonable ways of nature conservancy. It is apparent that collecting data and part of the publications have been realized together with Prakash Kumar Paudel, MSc. Therefore part of my comments fit to both Ph.D. candidates.

Since large part of the submitted thesis has been already published and therefore has had to pass through editorial process including reviewing, I am not going to make specific comments to the published papers.

In the General Introduction (page 1), the Ph.D. candidate speaks about at least five still existing species of tigers. Besides the fact he probably meant “*sub-species*”, not “*species*”, I wonder what his

opinion about this taxonomy is. How are the sub-species recognized? How much can such division affect the conservation strategies (if at all)?

What are the "other basic criteria" used for the identification of the scat of tiger and leopard (Paper III, p. 7, line 19 of the manuscript)?

I would have concern with the submitted manuscripts. Declared submission to prestigious journals such as *Biodiversity and Conservation* (Paper III), *Journal of Environmental Management* (Paper V), *Journal of Mammalogy* (Paper VI) and *Animal Conservation* (Paper VII) look impressive. There is no guarantee they will be accepted by these journals, however. It seems to me that subjects of individual studies overlap to some extent. Similar conclusions can be found also in abstracts of all submitted papers. For example "...Hence, restoring large populations of prey and reducing the level of human disturbance are the key measures necessary for the effective conservation of tiger and leopard..." in paper III, "...However, the major prey species of tiger were negatively associated with human disturbance..." in paper V, and "...We recommend that management of human disturbances inside the park and regular monitoring of the changes in the demography of ungulate populations will improve long term conservation strategies in this park..." in paper VI. Still, I have not found any cross citation but one between these parallel studies. Likewise, there is no reference to the Prakash Kumar Paudel's in press and/or submitted papers either. Is there any reason for this?

I do not fully understand the description of the Generalized linear models of the factors influencing the grouping patterns (Paper VI, page 25 of the manuscript, Table 3). How did you model the binomial-dependent variable "group size" as a dependent variable? (What software did you apply?)

In summary, the author of this Ph.D. thesis is the first author of five papers or manuscripts and four chapters in a book published by Springer in Dordrecht. The thesis brings extensive highly qualified information about the biodiversity of Nepal. Highly sophisticated methods have been applied resulting in convincing arguments which will be hopefully accepted by the Nepal authorities. The aims of the thesis have apparently been achieved. According to my opinion, Bishnu Prasad Bhattarai, MSc., the Ph.D. candidate, fulfils the requirements for the Ph.D. degree at the University of South Bohemia. Therefore, with no doubt, I do

recommend

his thesis for acceptance by the commission.

Praha 18th April 2012



Prof. Ing. Luděk Bartoš, DrSc.