

Conservation of the Proboscis Monkey, *Nasalis larvatus* in the Klias Peninsula, Sabah, Malaysia

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EXECUTIVE SUMMARY

This report covers the final 7 months activities of the Klias Proboscis Monkey project (period 1st June 2009 to 31st December 2009) which also serves as the completion report of this project. During the reporting period, all field data collection has been completed. Data analysis concerning the main research component is currently in process with some preliminary results are made available in this report. One paper has been published and one research manuscript has been submitted for publication. Five undergraduate students have received training on wildlife field base research techniques, mainly with respect to studying monkey behaviour and ecology, under the larger framework of this project. Two Ph.D candidates have commenced their studies on aspects of ecology and behaviour of proboscis Monkeys, of which one has submitted draft chapters of the thesis write-up, but the other candidate has aborted the project. On environmental awareness education, a total of six presentations have been made to various target groups at both regional and local levels including NGO organisations, research staff and postgraduate students of the Institute for Tropical Biology and Conservation, undergraduate students of University Malaysia Sabah (UMS), tourist and the local communities living in the vicinity of the study site. Environmental awareness education will be continued even beyond the project period with more information will be derived from the main research component of the project for education purposes. Although the main research paper will only be produced and published beyond the project period, in general the project has managed to accomplish most of its intended objectives within the 2 years of the project period.

1. BRIEF PROJECT BACKGROUND

This project entitled “Conservation of the proboscis Monkey, *Nasalis larvatus*, in the Klias Peninsula, Sabah, Malaysia” is a *ca.* 2 year project which began on 1st November 2007 and was completed on 31st December 2009. The overall aim of the project is “to protect the proboscis Monkey populations through the creation of multi-disciplinary projects, merging three different components namely research, training and environmental awareness education components”. The main component of the project is the research component entitled “The feeding ecology and behaviour of the proboscis monkey (*Nasalis larvatus*) in and around the Padas Damit Forest Reserve, Klias Peninsula, Sabah, Malaysia” where its specific objectives are as follows:

- (1) to describe the botany of the riverine and mangrove, and the transition zone between riverine and mangrove forests within the Padas Damit Forest Reserve and surrounding areas;
- (2) to monitor the production of plant parts of the forests, and to assess changes in food availability over a period of 12

months within the Padas Damit Forest Reserve and surrounding areas;

- (3) to monitor the distribution patterns of proboscis monkey populations in and around the Padas Damit Forest Reserve and to correlate these with changes in the distribution patterns of the food plants available over a period of 12 months;
- (4) to study the general behaviour of proboscis monkey with specific reference to feeding behaviour.

2. RESEARCH ACTIVITIES AND MAIN OUTPUTS OF THE RESEARCH COMPONENT

All research activities concerning field data collection on the phenology of plants in the botanical plots of the study site have been completed. Survey of proboscis monkey population distribution has also been completed and likewise, the behavioural data collection with emphasis on feeding has been completed too. A new research assistant (Mr. Pius Pansang), in addition to an existing field based research assistant (Mr. Gilmore Bolongan), was engaged on the project specifically to assist with data entry and analysis (from June to December 2009). Since field data collection has only been recently completed (in December 2009), only preliminary analyses of the data have been made and the main findings are given below:

- (1) A total of 11 proboscis monkey groups of one male and 3 groups of all males have been observed from mainly boat-based surveys. Only very limited land-based observations of the monkey groups were made due to shyness of the animals. No one focal proboscis monkey group was decided to be followed as it was not feasible to do so. Instead, monkey groups were observed and followed on an opportunistic basis i.e. whenever they were encountered in the study site. Since the study site in Padas Damit Forest Reserve (PDFR) is quite isolated from the nearest relatively large continuous forests, we can assume that the same monkey groups have been studied throughout the study period.
- (2) A total of 1 hectare botanical plots containing 279 trees (≥ 30 cm g.b.h) were established and monitored monthly for changes in fruit, flower and young leaf production.
- (3) As of September 2009, a total of 8,515 individual behavioural activities were recorded with feeding activity accounting for 1,703 or 20% of the behavioural activities. A total of 19 different plant species were used as food sources with *Bruguiera gymnorrhiza* and *Ficus binnendykii* made up 78% of the overall frequency of plant species eaten by the monkeys. These tree species were among the most dominant in the study area in PDFR. Food plant species also included less dominant tree species found in the forests and species planted by humans, but the amount taken were insignificant.
- (4) The dietary diversity of the proboscis monkeys was generally low corresponding to the tree density, tree species richness and diversity in PDFR which were also generally poor.
- (5) Proboscis monkeys were found to feed on young leaves, unripe fruits and flowers, with young leaves accounting for 93% of the food items taken. Young leaves were taken in large quantities all the times, but unripe fruits may be preferred during fruiting season. Unripe fruits of *Heritiera littoralis* were the most favoured.
- (6) All forest types-riverine, mangrove and mixed mangrove-riverine forests-in PDFR were used as feeding sites by the proboscis monkeys, but with seasonal localized movements to mangrove or riverine forests when trees were in fruit in those forest types.
- (7) The monthly distribution patterns of proboscis monkeys generally showed the animals were located well within the protected PDFR, but the range of distribution also included important feeding sites outside of this reserve near human settlements.

An extended abstract of the research component of the project highlighting among others the main preliminary findings of the research has been produced. This abstract, together with a power point presentation which consists of over 60 slides, has been submitted and presented by Assoc. Prof. Dr. Goro Hanya (Primate Research Institute, Kyoto University) in a seminar organised by PRO NATURA FUND in Japan in December 2009.

Other than the above, a scientific manuscript entitled “Sleeping-tree Selection by Proboscis Monkeys in Sabah, Malaysia: Effects of Low-Predation Pressure” has been produced and was submitted for publication in the International Journal of Primatology (IJOP-S-09-00257). The main findings of this paper are as follows:

- (8) A total of 88 trees used as sleeping sites by proboscis monkeys (*Nasalis larvatus*) in riverine, mangrove and mixed mangrove-riverine forests along the Garama River in PDFR were studied. Data recorded were the species name and several structural characteristics of the sleeping tree. In addition, a number of other forest traits associated with the sleeping trees were also measured. These variables were compared with those of 144 trees (from a sample of 248 trees with ≥ 30 cm g.b.h), located within 50 m from the riverbank sampled from 8 botanical plots (total 1 hectare). Trees in the plots represented the general vegetation patterns of the study area.
- (9) Choice of sleeping trees did not appear to be dependent on the tree species or distance of tree from riverbank. The selection of sleeping trees, which included trees farther inland (max 46 m from river) than reported elsewhere, suggested a low predation pressure from terrestrial predators inside the forest of the study area. Trees with preferred structural characteristics generally have large stems (mean = 143.6 cm g.b.h), are tall (mean = 34.3 m), with many (Median = 6) large (mean = 24.1 cm circumference) main branches. Such trees were also located near to other trees, with overlapping branches, creating good arboreal connectivity.
- (10) Choice of sleeping trees by proboscis monkeys may be related to safety from fall, comfort and locomotion efficiency.

3. MANAGEMENT IMPLICATIONS OF THE FINDINGS FROM RESEARCH COMPONENT

The implications for conservation management of the proboscis monkey populations in PDFR based on the findings of the research projects are many. Based on the data analysed thus far, specific areas that are frequented by the proboscis monkeys have been identified. These places which included areas outside the PDFR boundaries would be useful information for expanding protected areas with a view to conserve the proboscis monkey populations. Food tree species has been identified, and similarly, the sleeping trees of the monkey has been characterised. The monthly movement pattern of animals in relation to availability of preferred food items (young leaf and unripe fruits) has been recognized. This information will be useful for protecting the resources that the monkeys depend upon for their survival.

4. OUTPUTS OF THE TRAINING COMPONENTS

On the whole 5 undergraduate students of the B.Sc. Conservation Biology Degree Program and 1 Ph.D candidate of Universiti Malaysia Sabah have benefited from this project through partial or full funding and/or supervisory visits by the main investigator to the field. However, 1 Ph.D candidate has aborted the project due to personal reasons. All the B.Sc. students have graduated by the end of the project period. The following are names of the students who were involved in the project and their respective B.Sc. and Ph.D research project titles:

Muhammad Ridzwan Bin Ali (B.Sc.) ~ “The Daily Behavioural Activity Patterns of the Proboscis Monkey (*Nasalis larvatus*) at Garama, Klias Peninsula, Sabah”

Halley Clestina Gom Awing (B.Sc.) ~ “A Study on the Behaviour of Proboscis Monkey (*Nasalis larvatus*) Groves

2001) in Captivity at the Lok Kawi Wildlife Park, Sabah” (in Malay language)

Leong Ann Ying (B.Sc.) ~ “Characteristics of Proboscis Monkey’s (*Nasalis larvatus*) Sleeping Trees in Padas Damit Forest Reserve, Sabah, East Malaysia”

Siti Zaurah Binti Ag Gabor (B.Sc.) ~ “A survey on the Feeding Ecology of Proboscis Monkey (*Nasalis larvatus*) in Padas Damit Forest Reserve, Klias Peninsula, Sabah” (in Malay language).

Goh Cherng Jen (B.Sc.) ~ “Diversity of the Non-Flying Small Mammals in and around Padas Damit Forest Reserve” (in Malay language)

Joseph Tangah (Ph.D candidate) ~ “An Investigation of the Ecology and Behaviour of Proboscis Monkey (*Nasalis larvatus*) in Mangrove Habitats in Sabah, Malaysia”

5. OUTPUTS OF THE ENVIRONMENTAL AWARENESS EDUCATION COMPONENT

During the reporting period, a progress report of the main research component of the project was made to the Institute for Tropical Biology and Conservation (ITBC) in early July 2009. All academic staff of the ITBC and postgraduate students attended the presentation. From the start of the project, a total of 6 presentations have been made on various aspects of the project to regional scientific community in Japan, NGO organisations in Sabah, research staff and postgraduate students of UMS, undergraduates from 2 degree programs in UMS, local and international tourist and local communities living in the vicinity of the study site. Although not systematically coordinated, communication via casual conversation was another important means of how information from the project was disseminated especially to the tourist and the wider local communities in the state of Sabah. On the whole, at least 80 people have attended the talks, local and international seminars and progress report presentations about this project.

6. FUTURE PLAN BEYOND THE PROJECT PERIOD

- (1) Data analysis and writing of the main research papers will continue. The undergraduate dissertation projects will be turned into research manuscripts for submission to the monthly journal of NACS-J or other local publications.
- (2) The research component on conservation genetic of proboscis monkey which was a spin-off of the present project will continue. Collection of DNA materials of proboscis monkey will continue in other places within the Klias Peninsula. This endeavour may be extended to cover populations elsewhere in the state of Sabah and possibly also the entire Borneo Island in collaboration with other institutions such as the Wildlife Department of Sabah.
- (3) Environmental Awareness Education will be continued in the form of talks to school children in Garama, undergraduate students in UMS and non-government organisations. Research findings will be turned into friendly posters which will be distributed to local tour operators in Garama and schools near Garama for awareness education especially on the importance of proboscis monkey conservation.

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要約

マレーシア・サバ州、クリアス半島のテングザルの保全

Henry Bernard

この報告書は、クリアス半島のテングザルに関するプロジェクトの、最後の7ヶ月(2009年6月から12月)の活動を中心に、このプロジェクト全体の完了について報告するものである。この期間に、すべての野外での資料収集が完了した。このプロジェクトの主要な構成要素である研究に関しては、資料の分析が現在進行中であり、その予備的な結果についてはこの報告書にも述べてある。ひとつの研究論文がすでに出版され、もう一本が出版のため投稿中である。このプロジェクト全体の大きな枠組みの下、5人の学部学生が野生動物の野外での調査技術、おもに霊長類の行動と生態についての調査について訓練を受けた。二人の大学院博士課程の学生がテングザルの行動と生態についての研究を開始し、一人は

学位論文の執筆にこの調査結果を用いたが、もう一人については研究が中断している。環境教育に関しては、地域のNGO、マレーシアサバ大学熱帯生物学保全研究所のスタッフと大学院生、マレーシアサバ大学の学部学生、観光客、調査地近隣の地域住民など、さまざまな人々を対象にしたセミナーを6回開催した。環境教育に関する活動は、このプロジェクトの成果である研究活動の結果明らかになった新しい知見を加えて、このプロジェクトの終了後も続けられる予定である。このプロジェクトによる研究活動の成果が出版されるのはプロジェクトの終了後にならざるを得ないが、このプロジェクトの目的のほとんどは、この2年間で達成することができた。

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