

# Estimating Group Density of Assamese Macaque (*Macaca assamensis*) Using Multiple Covariate Distance Sampling (MCDS) in Lower Kanchenjunga Area (LKA), Eastern Nepal.

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Assessing science-based data on population and abundance of the species is the vital and foremost requirement before drafting any species conservation and management plan. Considering this fact, we used DISTANCE SAMPLING line transect survey to estimate the Assamese macaque population in Lower Kanchenjunga Area (LKA) in eastern Nepal. To achieve our goals, we received the seed money from the Primate Society of Great Britain and later on the matching funds for this project were received from the American Society of Primatologists, USA and Ocean Park Conservation Foundation, Hong Kong. The Idea Wild, USA had donated us 4 laser range-finders for this project.



Figure: A camera trapped photo of small troop of Assamese macaques where we can see the albino macaque (@Global Primate Network-Nepal)

Ninety line transects were walked totaling of 179.29 km in which 35 observations of Assamese macaques (*Macaca assamensis*) were made in Lower Kanchenjunga Area (LKA) in Eastern Nepal. These data were analyzed using freely available DISTANCE software. The result suggests that the macaque group encounter rate was 0.19521 groups/km in the study area. The estimated Assamese macaque group density (DS) was 1.2253 ( $\pm 0.21569$ ) groups/km<sup>2</sup> with the expected group size (ES) 26.714 ( $\pm 2.373$ ). Similarly, the estimated population density (D) and the total number of macaques (N) in the area were 32.733 ( $\pm 6.454$ ) and 1015.0 ( $\pm 200.13$ ) respectively. This first systematic and scientific population estimation of Assamese macaque has provided base line information about the status and abundance of the species in the region. In addition, the findings of this research are useful to understand, mitigate and manage crop-

raiding problems and useful to address the human-monkey conflict in the area. During our survey we had deployed some camera traps in the study area. Our one camera had trapped a troop of Assamese macaques in Chintapu Community Forest of Ilam district, which had a unique albino adult macaque. This was the first record of albino macaque in Nepal. We are planning to follow this troop to study its detail ecology and behavior in the coming days.



*Figure: Participants are listening lecture of Dr Falk Huettmann in DISTANCE SAMPLING training (@Global Primate Network-Nepal)*

In addition to population estimation of Assamese macaque, we organized a one day 'Distance Sampling Training Workshop' for the first time in Nepal which provided the opportunity to the postgraduate students of Nepalese university, government wildlife officers and young researchers for learning about the advanced wildlife population and abundance survey and data analysis technique. We hope that participants will apply this method for scientific estimation of population and abundance of wildlife including primates in their habitat country Nepal.



*Figure: A group photograph with all the participants and instructor Dr. Falk Huettmann  
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Besides the Assamese macaque population estimation and distance sampling training workshop, we have developed the first quantitative potential niche distribution models for the Assamese macaque for the 12 nations of South and South-east Asia: Afghanistan, Pakistan, Nepal, India, China, Bangladesh, Bhutan, Myanmar, Vietnam, Thailand, Lao PDR and Cambodia. We hope that our models help to identify the areas with a high probability of the presence of Assamese macaques, which is information that can be applied to identify new population of this species and to planning future surveys in previously un-surveyed areas in the region. The model outputs are also helpful for understanding the biogeography and historical ecological niche evolution of the Assamese macaque.