Mayuree Umponjan 2006: Ecology and Application of GIS for Analysis of the White- handed Gibbon (*Hylobates lar*) Habitat at Phu Khieo Wildlife Sanctuary, Chaiyaphum Province. Master of Science (Forestry), Major Field: Forest Biology, Department of Forest Biology. Thesis Advisor: Mr. Naris Bhumpakphan, Ph.D. 96 pages.
ISBN 947-16-2258-9

The ecological study of white-handed gibbon and the application of GIS for analysis of their habitat were intended to combine the use of technology with a field study of wildlife at Huai Mai Sot Yai area in Phu Khieo Wildlife Sanctuary. The main purpose of this research was to study white-handed gibbon's ecology and build the habitat suitability map of white-handed gibbons using GIS. This research was conducted during November 2003 – October 2004. The methods of this study included a) the direct observation of a gibbon family to obtain behavior, home range and food types data, b) the auditory method to locate gibbons and analyze their population density, and c) the application of the GIS technique and logistic regression (forward stepwise) to estimate habitat suitability and the probability of distribution of gibbons in the study area.

The focal gibbon's family had initially between 3-5 members varying by emigration and birth. The adults' behavior consisted of locomotion (29%), feeding (25%) and grooming (17%). Juveniles' behavior included locomotion (35%), feeding (34%) and playing (9%). The home range of the focal gibbon family, which was analyzed by the 95% Kernel method, was 60 ha throughout the year. The overlapping core area and the territory both had identical sizes of 41 ha and 41 ha. The gibbon's diet composition was showed that there were 25 species of food plants throughout the year. In the dry season, gibbon utilized 16 species of food plants and in the wet season 17 species of food plants. It was categorized into ripe fruits (42%), unripe fruits (16%), young leaves (22%), flowers (6%) and shoots (14%). The white-handed gibbon's density was 2.5 families per km^2 and 8 individuals per km^2. The significant factors confluence on habitat used by the white-handed gibbons at Huai Mai Sot Yai area was consist of higher elevation, lower slope, proximity to streams and the road and include dry evergreen and hill evergreen forest. From totally study area (22 km^2), the most suitable zone utilized by the gibbon family was 28.31% (6.22 km^2), moderate suitable zone 27.26% (5.99 km^2) and less suitable zone 44.43% (9.76 km^2). The ecology and behavior, population density, and the habitat suitability map of the white-handed gibbon in Huai Mai Sot Yai area were fruitful for management and conservation of the gibbon in Phu Khieo Wildlife Sanctuary. Furthermore, the recommendations for further studies were mentioned.

/ /

Student's signature Thesis Advisor's signature

ACKNOWLEDGMENTS

My great appreciation and thanks are expressed to Asst. Prof. Dr. Naris Bhumpakphan, Department of Forest Biology, Kasetsart University, Committee Chairman, for his direction, guidance, and kind suggestions for this study. I am deeply indepted to my graduate committee, Asst. Prof. Dr. Yongyut Trisurat, Department of Forest Biology, Kasetsart University and Dr. Anak Pattanavibool, Director of WCS-Thailand Program, for their valuable comments and advises. My special thanks also to Assoc. Prof. Dr. Andreas Koenig, Anthropology Department, Stony Brook University, New York, for his guidance, kind suggestions, and editing of my English writing.

I wish to thank Miss Eileen Larney, Stony Brook University and Miss Thattaya Bidayabha for their editing of my English writing. I gratefully acknowledge Mr. Supagit Vinitpornsawan, DNP, for his kind suggestions, guidance with the GIS techniques and support for my study. I would like to thank Dr. Scott Suarez and Miss Pia Terranova for their suggestion in analyzing the home range size. I wish to thank Dr. Carola Borries for her guidance and help during the fieldwork.

During my work in the Phu Khieo Wildlife Sanctuary (PKWS), I appreciated the kindness and generosity of many people, in particular Mr. Jarupol Prabnasak, superintendent of PKWS and staff of PKWS, namely Mr. Kitti Kreetiyutanont and Mr. Mongkhon Khomsuk. I also thank all rangers and housekeepers for their friendly and helpful support.

I would like to thank Mr. Vuttinan Phongsai, PKWS and Miss Naiyana Tessana, for their identification of the trees and food plants in this study. Also, my special thank to the late Mr. Wichian Natongboa for his kindness to collect data with me. I wish to thank Mr. Surached Phupraserd, PKWS, and Mr. Chakrit Thanettada for their kind support with data collection. I would like to thank my friends (Forester 64), elder and younger foresters, and everyone in the Wildlife Research Division, DNP, for their inspiration. Finally, special thanks go to my family and Mr. Thithi Sonsa, whose constant inspiration, encouragement, and understanding help me to complete this study.

Mayuree Umponjan

May 2006