

**STUDY OF HABITAT AND POPULATION STATUS OF SPOTTED  
DEER (*Axis axis*, Erxleben) IN CHITWAN NATIONAL PARK**



**BY  
PREM LAL GUPTA**

**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE, CENTRAL  
DEPARTMENT OF ZOOLOGY SPECIALIZING IN ECOLOGY**

**CENTRAL DEPARTMENT OF ZOOLOGY  
INSTITUTE OF SCIENCE AND TECHNOLOGY  
TRIBHUVAN UNIVERSITY  
KIRTIPUR, KATHMANDU, NEPAL  
JANUARY, 2007**

Phone No.: 01-4331896



TRIBHUVAN UNIVERSITY  
INSTITUTE OF SCIENCE AND TECHNOLOGY  
CENTRAL DEPARTMENT OF ZOOLOGY  
KIRTIPUR  
KATHMANDU, NEPAL

## RECOMMENDATION

It is my pleasure to mention here that Mr. Prem Lal Gupta has carried out the dissertation entitled “**Study of habitat and population status of spotted deer (*Axis axis*, Erxleben) in Chitwan National Park.**”, under my supervision and guidance. This is the candidate’s original work, which brings out important findings essential for Biodiversity Conservation. To the best of my knowledge, this dissertation has not been submitted in this university and any other institutions.

I recommended that the dissertation be accepted for partial fulfillment of the requirement for the **degree of Master of Science in Zoology** specializing in **Ecology**.

.....

Supervisor

**Dr. Ramesh Shrestha**

Central Department of Zoology

Tribhuvan University

Kirtipur, Kathmandu, Nepal

Date: .....



TRIBHUVAN UNIVERSITY  
INSTITUTE OF SCIENCE AND TECHNOLOGY  
CENTRAL DEPARTMENT OF ZOOLOGY  
KIRTIPUR  
KATHMANDU, NEPAL

**APPROVAL**

The dissertation submitted by Mr. Prem Lal Gupta entitled “**Study of Habitat and Population Status of Spotted deer (*Axis axis*, Erxleben) in Chitwan National Park**” has been accepted as a partial fulfillment of **Master Degree in Zoology** specializing in **Ecology**.

**EXPERT COMMITTEE**

.....  
Supervisor  
**Dr. Ramesh Shrestha**  
Central Department of Zoology  
Tribhuvan University, Kathmandu, Nepal

Date: .....

.....  
Head of Department  
**Prof. Dr. Tej Kumar Shrestha**  
Central Department of Zoology  
Tribhuvan University, Kathmandu, Nepal

Date: .....

.....  
External Examiner

Date: .....

## ACKNOWLEDGEMENTS

I owe depth of gratitude to my academic supervisor, **Dr. Ramesh Shrestha**, Central Department of Zoology, Tribhuvan University for his kind guidance, perpetual advice and invaluable inspiration throughout the study.

I would like to thank sincerely Prof. Dr. **Tej Kumar Shrestha**, Head, Central Department of Zoology, Tribhuvan University and other respected teachers for their academic support.

The Department of National Park and Wildlife Conservation (DNPWC) granted permission to initiate this study in the Chitwan National Park. I would like to thank late Dr. Tirtha Man Maskey and late Mr. Narayan Prasad Poudel of DNPWC. Similarly, Mr. Jhamak Karki, Assistant Ecologist and Mr. Ram Prasad Bagale, Assistant Ecologist need special thanks for their encouragement and suggestions.

Among the many people that helped in the field, I would especially like to thank Mr. Bed Prakash Khadka, Ranger, Gharial Conservation Programme, Chitwan National Park to providing suggestions for the study in the field and also to Mr. Ashok Bbandari, Ranger, Chitwan National Park for providing GPS during the study period. I would like to thank Mr. Tika Ram Adhikari, Warden for giving permission and suggestions for the study.

I would like to thank Mr. Bal Bahadur Lama, senior guide for the help during the field and identification of unknown plants of the field. I would like to thank Mr. Yet Bahadur Darai, guide for the help in the field during the study period and also to Army staff of Chitwan National Park for their admirable support to make this work successful.

I wish to extend thanks to my colleagues Mr. Chhatra Raj Pandit, Mr. Kapil Jung Pandey, Binay Chatrubedi and Friends Mr. Shrawan Kohar, Mr. Rajesh Choudhary, Mr. R.D. Patel for sharing ideas during the write up of this thesis and Mr. Prakash Man Rajbanshi, Lecturer, Campion Academy for help in thesis writing.

I am indebted to my family members for their boundless love and continuous encouragement for the study.

Prem Lal Gupta

Exam Roll N. 534

Batch 2060/061

T.U. Regd. No.: 5-1-49-984-98

## ABSTRACT

STUDY OF HABITAT AND POPULATION STATUS OF SPOTTED DEER (*Axis axis*, ERXLEBEN) IN CHITWAN NATIONAL PARK, NEPAL, was studied between May 2006 and July 2006. The main objectives were to study the habitat utilization and population status of spotted deer in the northern side of the Chitwan National Park.

The transect line-plot methods were used for the study of habitat utilization and vegetation of the study area. Similarly, direct observations were employed for the population study.

Plant species like *Shorea robusta*, *Syzigium cerasoides*, *Litsea monopetala* and *Dillenia pentagyna* were dominant in Sal forest while *Murraya koenigii*, *Glochidion velutinum*, *Errata elliptica*, *Trewia nudiflora*, *Litsea monopetala* and *Bombox ceiba* in riverine forest. The dominated species in grassland were *Sachharum spontaneum*, *Imperata cylindrica*, *Digitarea ciliaris* etc.

The average density of spotted deer was estimated 23 individual per square kilometer at present study. The male to female sex ratio was 1:1.8.

The riverine forest which was dominated by *Trewia nudiflora* and *Bombox ceiba* with less dense understory of shrubs and saplings was most preferred. The spotted deer preferred floodplain grassland where density of grasses was low and height less than chest height.

# TABLE OF CONTENTS

**RECOMMENDATION**  
**APPROVAL LETTER**  
**ACKNOWLEDGEMENT**  
**TABLE OF CONTENTS**  
**LIST OF TABLES**  
**LIST OF FIGURES**  
**ABBREVIATION**  
**ABSTRACT**

	<b>Page No.</b>
<b>CHAPTER-ONE: INTRODUCTION</b>	<b>1-6</b>
1.1 Background	1
1.2 Morphology	5
1.3 Ecology & Behaviour	5
1.4 Distribution	7
<b>CHAPTER-TWO: STUDY AREA</b>	<b>8-18</b>
2.1 Location	8
2.2 Climate	8
2.3 Topography	12
2.4 Geology & Soil	13
2.5 Fauna	13
2.6 Vegetation	15
2.6.1 Sal Forest	15
2.6.2 Riverine Forest	16
2.6.3 Grass Land	17
2.7 Objectives	17
2.8 Rationles of Selection of the Study Area	18
2.9 Limitations of the Study	18

<b>CHAPTER–THREE: LITERATURE REVIEW</b>	<b>19-22</b>
<b>CHAPTER–FOUR: METHODOLOGY</b>	<b>23-27</b>
4.1 Site Selection	23
4.2 Population Density	23
4.3 Vegetation	24
4.4 Habitat Preference	24
4.5 Vegetation Analysis	25
4.6 Data Analysis	26
4.6.1 Density & Relative Density	26
4.6.2 Frequency & Relative Frequency	26
4.6.3 Basal Area & Relative Dominance	27
4.6.4 Important Value Index	27
<b>CHAPTER- FIVE: RESULT</b>	<b>28-33</b>
5.1 Vegetation Analysis of Main Study Area	28
5.1.1 Sal Forest	28
5.1.2 Reverine Forest	29
5.1.3 Grass Land	30
5.2 Habitat Utilization	31
5.3 Group Size of Chital	32
5.4 Population Status	33
<b>CHAPTER–SIX: DISCUSSION</b>	<b>34-37</b>
6.1 Vegetation Study	34
6.2 Population Status	36
6.3 Habitat Preference	37
<b>CHAPTER–SEVEN: CONCLUSION AND RECOMMENDATION</b>	<b>38-40</b>
<b>REFERENCES</b>	<b>41-45</b>

## APPENDICES

### LIST OF TABLES

	<b>Page No.</b>
Table 1: Rainfall (mm) for Rampur	10
Table 2: Temperature ( <sup>0</sup> C) for Rampur	12
Table 3: Large Mammals Found in the Chitwan National Park	14
Table 4: Number of Plots in Each Habitat Type, Plots with Pellets and Habitat Preference Value	31
Table 5: Group Size of Chital in the Study Area	33

### LIST OF FIGURES

Fig.1: Chitwan National Park	
Fig.2: Monthly Variation of Rainfall of the Study Area (2002-2004)	
Fig.3: Monthly Variation Temperature of Study Area (2002-2004)	
Fig.4: Habitat Preference Value of Chital	



## ABBREVIATION

Apr	-	April, Aug- August
BA	-	Bikram Sambat
C	-	Circumference of Breast Height
<sup>0</sup> C	-	Degree Centigrade
CNP	-	Chitwan National Park
Dec	-	December
E	-	East
Feb	-	February
Fig	-	Figure
RPG	-	Flood Plant Grassland
G	-	Grass
GL	-	Grassland
H	-	Herbs
Ha	-	Hectare
ha <sup>-1</sup>	-	Per hectare
HMG	-	His Majesty's Government
HP	-	Habitat Preference
IUCN	-	International Union for the Conservation of Nature & Natural Resources
IVI	-	Importance Value Index
Jan	-	January
Jun	-	June
Km	-	Kilometer
M	-	Meter
Mar	-	March
Mm	-	Millimeter
N	-	North
NAS	-	National Audubon Society
Nov	-	November

No / no	-	Number
Oct	-	October
Pl / ha	-	Plant Per Hectare
PPE	-	Pellet (%) in Each Habitat Type
R	-	Radius of Breast Height
RB	-	River Beds
RBA	-	Relative Basal Area
RD	-	Relative Density
RF	-	Relative Frequency
RF- D	-	Reverine Forest of Druba
RF- I	-	Reverine Forest of Icharni
S	-	Shrubs
SD	-	Standard Deviation
Sep	-	September
SF	-	Sal Forest
Spp.	-	Species
Sq. Km.	-	Square Kilometer
T	-	Trees
T. Max	-	Maximum Temperature
T. Min	-	Minimum Temperature
TPP	-	Total Pellet Present (%) of the all Habitat Types