

# GLOBAL PRIMATOLOGY VIRTUAL CONFERENCE

**LOCATION:** Webex

**DATE & TIME:** March 22, 2021, 8:00 AM - March 26, 2021, 5:00 PM (PT)

**REGISTRATION:** <https://www.eventcreate.com/e/primatologyconference>

Central Washington University is sponsoring a series of webinars featuring primatologists across the world. The topics discussed will cover a wide array of primate species in both wild and captive settings. Everyone is welcome!



## MONDAY, MARCH 22

Lemurs, Lorises, and Tarsiers

**GUEST SPEAKERS:**

**Anna Nekaris, Ph.D.**  
Oxford Brookes University, UK

**Marni LaFleur, Ph.D.**  
University of San Diego, USA

**Erin Ehmke, Ph.D.**  
Duke Lemur Center, NC, USA

**Myron Shekelle, Ph.D.**  
Western Washington University, USA

## TUESDAY, MARCH 23

Catarrhines

**GUEST SPEAKERS:**

**Kuenzang Dorji, M.Sc.**  
Central Washington University, USA

**Corinna Most, Ph.D.**  
Iowa State University, USA

**Jacinta Beehner, Ph.D.**  
University of Michigan, USA

## WEDNESDAY, MARCH 24

Platyrrhines

**GUEST SPEAKERS:**

**Primarily Primates**  
San Antonio, TX, USA

**Laura Abondano, Ph.D.**  
University of Texas at Austin, USA

**Pacific Primate Sanctuary**  
Mahawao, HI, USA

## THURSDAY, MARCH 25

African Apes

**GUEST SPEAKERS:**

**Kirsty Graham, Ph.D.**  
University of Saint Andrews, UK

**Lydia Hopper, Ph.D.**  
Lincoln Park Zoo, IL, USA

**Austin Leeds, Ph.D.**  
Disney's Animal Kingdom, FL, USA

**Chimpanzee Sanctuary Northwest**  
Cle Elum, WA, USA

## FRIDAY, MARCH 26

Asian Apes

**GUEST SPEAKERS:**

**Center for Great Apes**  
Wauchula, FL, USA

**Doug Cress**  
World Association of Zoos and Aquariums

**Gibbon Conservation Center**  
Santa Clarita, CA, USA

**Michael Reid, Ph.D.**  
Durham College, Canada

### Primates Conservation in Bhutan

Golden langur (*Trachypithecus geei*)

KUENZANG DORJI  
M.Sc in Primate Behavior

Rufford

### A little about me!

Rufford @NatureOnFocus

### Bhutan at Glance

Bhutan Population (2017)  
777,846

Rufford

### Conservation and Bhutan

#### The 4 Pillars of GNH

- Sustainable & Equitable Socio-Economic Development
- Environmental Conservation
- Good Governance
- Preservation & Promotion of Culture

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### Conservation and Bhutan

Historical Leadership of Their Majesties, The 4th and 5th Kings of Bhutan

Protected Areas and Biological Corridors of Bhutan

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### Primates of Bhutan

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Bhutan is a conservation stronghold for seven species of non-human primates: Slow loris, Assamese macaque, rhesus macaque, Nepal gray langur, golden langur, Capped langur and *Macaca murizala*.

Primates species of Bhutan are exposed to two broad category of threats: Habitat and Population

Rufford

### EXTIRPATION RISK OF THE ENDANGERED GOLDEN LANGUR *TRACHYPITHECUS GEEI* (KHAJURIA, 1956) INSIDE AND OUTSIDE BIOLOGICAL CORRIDORS, LANGTHEL SUB-DISTRICT, TRONGSA, CENTRAL DISTRICT BHUTAN

### RESEARCH OBJECTIVES AND HYPOTHESIS

- Group size and structure and sex ratio;
- Winter feeding range for golden groups and associated natural and anthropic risks; and
- Characteristics of sleeping sites and trees and the associated natural and anthropic risks that influence the choice of sleep sites.

I assumed that the group size of the golden langur will be bigger; feeding range larger, and groups more vulnerable to extirpation outside than inside the biological corridors.

### FACTS ABOUT THE GOLDEN LANGURS

- The world's top 25 most endangered primates and are distributed in Bhutan and India
- A leaf eating golden orange colobine monkey which are sexually dimorphic
- Found in warm broadleaved forests of Degana, Sarpaang, Trongsa, Tsirang, Wangduephodrang, and Zhiangang districts



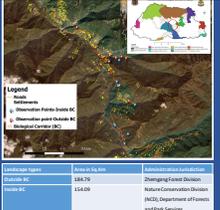
### FACTS ABOUT THE GOLDEN LANGURS CONT..

- Live in uni-male/multi-female groups of 3 to 9 individuals, bi-male/multi-female groups of 8 to 15 individuals, and multi-male/multi-female groups
- Attain maturity ( Male: 5-7 years and Female: 4 years
- Endangered (IUCN Red List
- Appendix-I (CITES).
- Schedule-I species (FNCA 1995, Bhutan)



### STUDY SITES

- Two distinct landscapes that measures 338.83 sq.km.
  - Adjacent to 2,642 people
  - 76 kilometers of roads,
  - 28 kilometers of power transmission lines and
  - 564.27 ha of agricultural land
- The biological corridor (BC) that connects Thrumshingla National Park (PNP), Jigme Singye Wangchuk (JSWNP), and Royal Manas National Parks (RMNP) and have enforced protection



Study Site	Area (sq.km)	Administrative Division
Outside BC	188.79	Zhangmang Forest Division
Inside BC	154.09	Nature Conservation Division (NCD), Department of Forests and Park Services

### MATERIALS AND METHODS

- Equipment:
  - spotting scope (Vortex Viper HD 20-60x65 Spotting Scope)
  - binoculars (Celestron 8x42 Nature DX Binocular)
  - Global Positioning Unit (GPS), Smartphone GPS and app (SW Maps)
  - Camera (Nikon COOLPIX P1000 Digital Camera).
  - Reconyx camera trap.
  - Sampling Tables.
  - Compass (SUUNTO).
  - Hypsometer
  - Diametereters (SUUNTO), and
  - Diameter tape for measuring tree girth.



### METHODS

- Scan sampling along roads (both primary and farm roads) and existing trails as transect lines-
- Minimum Convex Polygon (MCP) method
- Heat Map-GIS analysis tool)
- Remote cameras and sign surveys
- Key informant interview
- Vulnerability risk assessment based on measurement scale.



Data collection: November 2019 to April 2020

### ANALYSIS

- Calculate proportions and ratios
- Perform t-test to determine the difference on group mean size
- Qualitative Risk Analysis (QRA) based on risk exposure pathways
- Pearson correlation to test the relationship between tree DBH, tree height, and langur group sizes.

### RESULTS

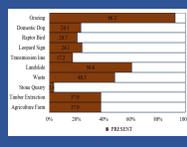
- Frequency of Golden Langur Encounters
  - 287 individuals
  - 28 langur groups ranging inside (n = 9) and outside (n = 15) the BC
  - Outside BC (10.33) times and Inside BC ( 6.33) times
- Golden Langur Group Size and Composition and Sex Ratio

Landscape type	Adult Female		Adult Female: Sub-adult		Adult Female: Infant	
	n	%	n	%	n	%
Outside BC	11.55	10.46	1.01	10.11		
Inside BC	11.77	10.43	1.02	10.20		



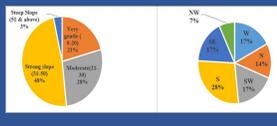
### RESULTS CONTD

- Locations and Characteristics of Sleeping Sites
  - Langurs slept in 28 tree species from 21 Linnæan families and 14 orders.
  - The two most frequently used species were *Stipulum insignis* (9 times) and *S. egypticum* (4 times) which has spreading, open shape
  - Anthropic and Environmental Factors



### RESULTS CONTINUE

- Slope Gradient and Aspect of the Sleeping Sites



### RESULTS CONTINUE..



**Golden Langur Extirpation Risks**

Landscape	Electrocution	Road Kill	Retaliatory Kill	Habitat disturbance	Group Structure	Predation
Outside	OBC1, OBC2, OBC4, OBC7, OBC8, OBC9, OBC10, OBC12, OBC13, and OBC14	OBC1, OBC7, OBC8, OBC9, and OBC10	OBC1, OBC4, OBC8, OBC9, OBC10, OBC13, and OBC14	OBC1, OBC7, OBC8, OBC9, OBC10, OBC11, OBC12, OBC13, and OBC14	OBC2 and OBC9	OBC3 and OBC9
Inside	IBC-07	IBC1 and IBC3	IBC2 and IBC4	IBC3		IBC3

OBC9 is the group most vulnerable to extirpation. Groups OBC8 and OBC10 are moderately vulnerable to extirpation, and group OBC7 is the least vulnerable.

### CONCLUSION

- Golden langur living outside the BC has variation in group size and social structure, and have larger group sizes with multi-male/multi-female structure.
- Golden langurs sleeping in tall, large trees with spreading branches to accommodate all group members in one tree.
- Golden langurs were threatened by the presence of natural predators (leopard, python, and raptors), but natural predation of golden langur appears to be a rare event.
- Golden langurs feed on cultivated fruits and vegetables accelerating the human-langur interactions.
- Golden langurs were most vulnerable to mortality caused by electrocution, road kill, and dog kill.

### RECOMMENDATIONS

- Installation of speed limit signage and speed breakers to limit the speed
- Installation of insulated electric cables and fencing around power transformers
- Refrain domestic dogs freely ranging in langur feeding area
- Establishment of a community-based awareness program.

### WAY FORWARD

- Ecological and behavioral flexibility of golden langur
- Primate conservation Research through Citizen Science
- Golden langur conservation threats at local level
- Phylogeny of hybridized golden langur
- Bhutan Primate Conservation Society



GOLDEN LANGUR MONITORING IN BHUTAN  
Golden langur is considered as one of the world's Top 25 Most Endangered Primates

### BOTTLENECKS

- Not many people come forward to study primates
- Lack of domestic capacity equipped with knowledge and skills to study primates
- Bhutan in particular lack resource and capacity to keep pace with the new development and preparing standard project proposal acceptable for financing.
- Lack of domestic resources for co-funding – disadvantage for us to access funds

### ACKNOWLEDGEMENT

- Committee members
  - Dr. Leni Kay Sheeran
  - Dr. Tim England
  - Dr. Kathleen Barlow
  - Dr. Jennifer
- Field Research Assistants (Ratan Giri, Kado Rinchen, Namgay Dorji)
- Central Washington University
- Rufford Foundation
- Family members