8TH ASIAN PRIMATE SYMPOSIUM

13-16 November 2022

PROGRAM

PRINTED ON RECYCLED PAPER

APS 2022 VIETNAM

THREE MONKEYS WILDLIFE CONSERVANCY

TRƯỜNG ĐẠI HỌC LÂM NGHIỆP · VIETNAM NATIONAL UNIVERSITY OF FORESTRY · SINCE 1964

CONTENT

APS 2022
VIETNAM

1. FOREWORD

The Asian Primate Symposium is the largest of its kind in Asia. It provides primate experts and stakeholders with a vibrant social environment where they can share their findings, views, and ideas regarding diverse topics, ranging from ethology, ecology, genetics, taxonomy to conservation. The symposium also promotes collaboration, partnership, and networking and represents as well an excellent forum to explore new funding opportunities for joint proposal development. It will also provide a unique opportunity to get a first-hand insight into Vietnam's unique rich primate fauna and its conservation work. As such, attendees will visit the Endangered Primate Rescue Center (EPRC) and Van Long Nature Reserve, during which in-situ and ex-situ conservation efforts and challenges will be presented. The symposium is kindly hosted by Vietnam National University of Forestry in Hanoi and organized in cooperation with 'Three Monkeys Wildlife Conservancy'.

2. ORGANIZING COMMITTEE

Vietnam National University of Forestry (VNUF)

- Prof. Dr. Tran Van Chu
- Prof. Dr. Pham Van Dien
- Prof. Dr. Phung Van Khoa
- Prof. Dr. Hoang Van Sam

Three Monkeys Wildlife Conservancy (TMWC)

- Dr. Govinda Lienart
- Tilo Nadler
- Nguyen Thi Thu Hien

3. SCIENTIFIC COMMITTEE

- Dr. Andie Ang – Mandai Nature, Singapore
- Dr. Ramesh Boonratana – Mahidol University, Thailand
- Dr. Dilip Chetry – Aaranyak-Gibbon Conservation Centre, Hollongapar Gibbon Wildlife Sanctuary, India
- Dr. Susan Cheyne – Borneo Nature Foundation – Indonesia
- Dr. Camille Coudrat – Director at Association Anoulak, Laos
- Prof. Dr. Bert Covert – University Colorado at Boulder, USA
- Prof. Dr. Dong Thanh Hai – Vietnam National University of Forestry, Vietnam
- Prof. Dr. Peng-Fei Fan – Sun Yat-Sen University, China
- Dr. Ha Thang Long – Frankfurt Zoological Society, Vietnam
- Prof. Dr. Yuzuru Hamada – Kyoto University, Japan
- Prof. Dr. Chengming Huang – Institute of Zoology, China
- Prof. Dr. Michael Huffman – Wildlife Research Center, Japan
- Dr. Govinda Lienart – Three Monkeys Wildlife Conservancy, Vietnam
- Prof. Dr. Suchinda Malaivijitnond – Chulalongkorn University, Thailand
- Prof. Dr. Nguyen Xuan Dang – IEBR, Vietnam
- Prof. Dr. Christian Roos – German Primate Centre, Germany
- Arif Setiawan – Swaraowa, Indonesia
- Tilo Nadler – Three Monkeys Wildlife Conservancy, Vietnam
- Dr. Le Khac Quyet – Fauna & Flora International, Vietnam
- Dr. Van Ngoc Thinh – WWF, Vietnam
- Prof. Dr. Vu Tien Thinh – Vietnam National University of Forestry, Vietnam

4. SPONSOR ACKNOWLEDGMENTS

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5. PRIMATES OF VIETNAM

Among the countries of Southeast Asia, Vietnam has the highest number of primates with 24 species and 26 taxa, followed by Laos with 18 species, Thailand and Myanmar with 17 species each, and Cambodia with 13 species. However, Vietnam also has the highest number of threatened primate species. Twenty-two species, or 90%, are threatened with extinction, of which 10 species (42%) are 'Critically Endangered' and at risk of extinction, including the three species endemic to Vietnam, the Delacour's langur (*Trachypithecus delacouri*), the Cat Ba langur (*Trachypithecus poliocephalus*) and the Tonkin snub-nosed monkey (*Rhinopithecus avunculus*). The Cat Ba Langur is the rarest colobine species in the world with less than 70 individuals, followed by the other two Vietnamese endemics which consist of less than 300 individuals per species. Since 1990, two primate species have been discovered in Vietnam and scientifically described, the grey-shanked douc langur (*Pygathrix cinereal*) and the northern yellow-cheeked gibbon (*Nomascus annamensis*). Four species whose existence was unconfirmed were rediscovered, the Delacour's langur, the Hatinh langur (*Trachypithecus hatinhensis*), including the black morph of this species, the Tonkin snub-nosed monkey, and the eastern black gibbon (*Nomascus nasutus*).

		Conservation Status
Family LORIDAE		
Pygmy slow loris	*Nycticebus pygmaeus*	EN
Bengal slow loris	*Nycticebus bengalensis*	EN
Family CERCOPITHECIDAE		
Subfamiliy CERCOPITHECINAE		
Northern pig-tailed macaque	*Macaca leonina*	VU
Assamese macaque	*Macaca assamensis*	NT
Rhesus macaque	*Macaca mulatta*	LC
Stump-tailed macaque	*Macaca arctoides*	VU
Long-tailed macaque	*Macaca fascicularis*	EN
Con Dao long-tailed macaque	*Macaca fascicularis condorensis*	EN
Subfamily COLOBINAE		
Indochinese silvered langur	*Trachypithecus germaini*	EN
Annamese silvered langur	*Trachypithecus margarita*	EN
Indochinese grey langur	*Trachypithecus crepusculus*	EN
Francois' langur	*Trachypithecus francoisi*	EN
Cat Ba langur	*Trachypithecus poliocephalus*	CR
Delacour's langur	*Trachypithecus delacouri*	CR
Hatinh langur	*Trachypithecus hatinhensis*	EN
Black langur	*Trachypithecus hatinhensis* morph *ebenus*	EN
Red-shanked douc langur	*Pygathrix nemaeus*	CR
Grey-shanked douc langur	*Pygathrix cinerea*	CR
Black-shanked douc langur	*Pygathrix nigripes*	CR
Tonkin snub-nosed monkey	*Rhinopithecus avunculus*	CR
Family HYLOBATIDAE		
Western black gibbon	*Nomascus concolor*	CR
Eastern black gibbon	*Nomascus nasutus*	CR
Northern white-cheeked gibbon	*Nomascus leucogenys*	CR
Southern white-cheeked gibbon	*Nomascus siki*	CR
Northern yellow-cheeked gibbon	*Nomascus annamensis*	EN
Southern yellow-cheeked gibbon	*Nomascus gabriellae*	EN

6. PROGRAM

Sunday 13th November

WELCOMING 14:00 – 00:00	
14:00 or 16:00	Transportation by bus from Hanoi to Xuan Mai (venue)
15:30 – 18:30	Check in and Registration
18:30 – 19:00	Bus transportation from hotel to venue icebreaker
19:00 – 00:00	Icebreaker dinner

Monday 14th November

OPENING CEREMONY 09:00 -10:30	
09:00 – 10:00	Opening ceremony (G6 Building)
10:00 – 10:30	Plenary (G6 Building) **Genomics of Asian Primates** Christian Roos German Primate Center - Leibniz Institute for Primate Research
10:30 – 11:00	**COFFEE BREAK** (G6 Building)

SESSION 11:00 -12:00

THEME: Human – Nonhuman primate interactions and conflicts

Room A (Building G2) - Chair: Marina Kenyon

11:00 – 11:20	**[A1]** **Neglected night: unveiling threats of 'Endangered' Bengal slow loris (*Nycticebus bengalensis*) using 'Local Ecological Knowledge' in northeast India** Nabajit Das Gauhati University, B. H. College, Assam, India
11:20 – 11:40	**[A2]** **Eco-friendly livelihoods in exchange for safe slow lorises (*Nycticebus coucang* and *N. hilleri*) and other wildlife in Sumatra** Frantisek Pribrsky Ostrava Zoo, Czech Republic
11:40 – 12:00	**[A3]** **Surviving in the village matrix: Social organization and group dynamics of western Hoolock gibbons (*Hoolock hoolock*) in a community conserved village population of Assam, India** Jihosuo Biswas Primate Research Centre NE India

THEME: Behavior

Room B (Building G2) - Chair: Dong Thanh Hai

11:00 – 11:20	**[B1]** **Competition and conflict resolution: Perspective of Nicobar long-tailed macaque (*Macaca fascicularis umbrosus*)** Partha Sarathi Mishra Srishti Manipal Institute of Arts, Design and Technology
11:20 – 11:40	**[B2]** **A multi-method approach to study individual personality among Rhesus macaques (*Macaca mulatta*) in an anthropogenic setting** Taniya Gill University of Delhi, India

THEME: Conservation and Education	
Room C (Building G2) – Chair: Frantisek Pribrsky	
11:00 – 11:20	**[C1]** **What we have learned after eight years of environmental education in Balikpapan Bay** Stanislav Lhota Usti nad Labem Zoo, Czech Republic
11:20 – 11:40	**[C2]** **Developing the capacity of young researchers in primate conservation in Vietnam** Nguyen Thi Kim Yen Frankfurt Zoological Society in Vietnam
11:40 – 12:00	**[C3]** **The Kartini Effect: The role of women in primate conservation science in Indonesia** Tungga Dewi Hastomo Putri Javan Wildlife Institute (JAWI), Yogyakarta, Indonesia

12:00 – 14:00	**LUNCH**

SESSION 14:00 -15:20

THEME: Human – Nonhuman primate interactions and conflicts	
Room A (Building G2) - Chair: Jihosua Biswas	
14:00 – 14:20	**[A4]** **Community-led conservation action for gibbons at Jahoo, Cambodia** **Hélène Birot** World Hope International, Cambodia
14:20 – 14:40	**[A5]** **Learning to love and live with gibbons: A case study of amicable human-primate relationships from Assam, India** Ishika Ramakrishna Centre for Wildlife Studies, India

14:40 – 15:00	**[A6]** **Giving up gibbons: Using social media posts to understand the motives behind the surrender of gibbon pets in Indonesia** Afrizal Maulana Abdi Yayasan IAR Indonesia
15:00 – 15:20	**[A7]** **The impact of the Covid-19 pandemic: Learning from the story of Javan gibbon (*Hylobates moloch*) conservation** Arif Setiawan Swaraowa Indonesia
THEME: Behavior	
Room B (Building G2) - Taniya Gill	
14:00 – 14:20	**[B3]** **Female behaviour after infant loss in bonnet macaques (*Macaca radiata*)** Arlet Malgorzata E Adam Mickiewicz University, Poznan, Poland
14:20 – 14:40	**[B4]** **Dietary diversity of the endemic lion-tailed macaques (*Macaca silenus*) of the Western Ghats, India: A review** Sikha Hariharan Centre for Wildlife Studies, Bangalore, India
14:40 – 15:00	**[B5]** **Inter-individual differences predicting participation in intergroup conflict and its interplay with human-animal interactions in urban rhesus macaques (*Macaca mulatta*)** Bidisha Chakraborty University of California, Davis, USA
15:00 – 15:20	**[B6]** **The effect of energetic costs on behavioral patterns in female Javan** Dana Kang Ewha Womans University, Seoul, South Korea
THEME: Drone survey methods	
Room C (Building G2): Govinda Lienart	
14:00 – 14:20	**[C4]** **Monitoring Threatened Primate Communities using thermal imaging with unmanned aerial vehicle in Cat Tien National Park, Vietnam** Eva Elsa Gazagne Université de Liège, Belgium

14:20 – 14:40	**[C5]** **Testing and adopting drones (Unoccupied Aerial Vehicles – UAV) for surveying Delacour's langurs (*Trachypithecyus delacouri*) in difficult-to-access habitats** Trinh Dinh Hoang King Mongkut's University of Technology Thonburi, Thailand
14:40 – 15:00	**[C6]** **Using unmanned aerial vehicle (drone) with mounted thermal camera to detect and count arboreal primates: A case study of Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) in Khau Ca forest, Vietnam** Le Khac Quyet Fauna & Flora International
15:00 – 15:20	**[C7]** **Unmanned aerial vehicle (UAV) assisted in counting group size and enabled more accurate population surveys of the 'Critically Endangered' cao vit gibbon (*Nomascus nasutus*)** Nguyen Duc Tho Fauna & Flora International
15:20 - 16:00	**COFFEE BREAK** (G6 Building)

SESSION 16:00 - 17:20

THEME: Human – Nonhuman primate interactions and conflicts

Room A (Building G2) - Arif Setiawan

16:00 – 16:20	**[A8]** **Orangutan conflict cases in East Borneo, Indonesia** Oktaviana Sawitri Centre for Orangutan Protection, Indonesia
16:20 – 16:40	**[A9]** **Primate deaths due to electrocution: a case in Petungkriyono forest, Indonesia** Nur Aoliya Swaraowa Indonesia
16:40 – 17:00	**[A10]** **Online trade in Indonesian primates** Jochen Menner Prigen Conservation Breeding Ark, Taman Safari 2 Jatim, Java, Indonesia

17:00 – 17:20	**[A11]** **The expansion of the illegal primate trade in Indonesia** Indira Nurul Qomariah Centre for Orangutan Protection, Indonesia
THEME: Behavior	
Room B (Building G2) – Chair: Susan Cheyne	
16:00 – 16:20	**[B7]** **Observational learning from mother in immature wild Javan gibbons (*Hylobates moloch*)** Saein Lee Ewha Womans University, Seoul, South Korea
16:20 – 16:40	**[B8]** **How to be a good husband and father? A role of adult males in pair bond maintenance and parental care in Javan gibbons (*Hylobates moloch*)** Yoonjung Yi Nanjing Forestry University, China
16:40 – 17:00	**[B9]** **Preliminary study of the home ranging behavior of eastern hoolock gibbon (*Hoolock leuconedys*) in Myanmar** **Ngwe Lwin** Fauna & Flora International (FFI), Myanmar
17:00 – 17:20	**[B10]** **Introducing Project Sounds Kape: Tracking the sound of lar gibbon (*Hylobates lar*) in Kenyir Landscape, Terengganu, Malaysia** Aini Hasanah Abd Mutalib Institute of Tropical Biodiversity and Sustainable Development, University of Malaysia, Terengganu
THEME: Conservation	
Room C (Building G2) – Chair: Ha Thang Long	
16:00 – 16:20	**[C8]** **A Population Viability Analysis of douc langurs (*Pygathrix* spp.) in Vietnam** Emily C. Boucker Oxford Brookes University, UK
16:20 – 16:40	**[C9]** **Monitoring program of the northern white-cheeked Gibbon population (*Nomascus leucogenys*) in Pu Mat National Park, Vietnam** Hoang Nghia Cong Fauna & Flora International

16:40 – 17:00	**[C10]** **Assessment of climate change impacts on two endangered primates in Vietnam: Francois' langur (*Trachypithecus francoisi*) and cao vit gibbon (*Nomascus nasutus*)** Nguyen Tuan Anh University of Science, Vietnam National University, Hanoi
17:00 – 17:20	**[C11]** **Population status, diet and conservation of Hatinh langurs (*Trachypithecus hatinhensis*) in 'Tuyen Hoa Special-use Forest', Quang Binh Province** Dong Thanh Hai Vietnam National University of Forestry, Faculty of Forest Resources Management and Enviroment, Department of Wildlife Management, Hanoi

Tuesday 15th November

EXCURSION 7:30 - 19:30	
7:30 – 10:00	Transportation from hotel in Xuan Mai to Cuc Phuong National Park
10:00 – 12:00	Visit of the Endangered Primate Rescue Center
12:00 – 14:30	Lunch in Ninh Binh
14:30 – 15:30	Transportation to Van Long Nature Reserve
15:30 – 17:00	Visit by boat in Van Long Nature Reserve
17:00 – 19:30	Transportation back to hotel in Xuan Mai

Wednesday 16th November

SESSION 9:00 -10:20	
THEME: Genetics & Conservation	
Room A (Building G2) – Chair: Ruliang Pan	
9:00 – 9:20	**[A12]** **Unlocking museum collections for primate phylogenetics and conservation: Case studies from lorisiform primates** Le Duc Minh Vietnam National University, Hanoi
9:20 – 9:40	**[A13]** **The importance of genetic data from name-bearing type specimens** Christian Roos German Primate Center - Leibniz Institute for Primate Research
9:40 – 10:00	**[A14]** **Genomics of ecological and behavioural adaptation in primates** Lakshmi Seshadri German Primate Center - Leibniz Institute for Primate Research
10:00 – 10:20	**[A15]** **Conservation genomics of one of the most threatened primates, the Cat Ba langur (*Trachypithecus poliocephalus*), reveals genomic adaptation to saltwater consumption and small population size** Liye Zhang German Primate Center - Leibniz Institute for Primate Research
THEME: Conservation	
Room B (Building G2) – Chair: Amy Levine	
9:00 – 9:20	**[B11]** **Fourteen years of learning by the Dao Tien Endangered Primate Species Centre: Successful pygmy slow loris (*Nycticebus pygmaeus*) rescue and release in Cat Tien National Park** Marina Ann Kenyon Endangered Asian Species Trust
9:20 – 9:40	**[B12]** **Locomotion, postures, and substrate use in captive pygmy slow lorises (*Nycticebus* [*Xanthonycticebus*] *pygmaeus*) - implications for conservation** Dionisios Youlatos Aristotle University of Thessaloniki, School of Biology, Greece

9:40 – 10:00	**[B13]** **Contributions of Denver Zoological Foundation to the conservation of the Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) in Ha Giang Province** Luu Tuong Bach Denver Zoological Foundation, USA
10:00 – 10:20	**[B14]** **Deploying arboreal camera traps to monitor primates in Singapore** Andie Ang Mandai Nature, Singapore
THEME: Conservation and Behavior	
Room C (Building G2) – Chair: Vu Tien Thinh	
9:00 – 9:20	**[C12]** **Southwest China, the last refuge of continental primates in East Asia** Ruliang Pan Northwest University, Xian, China
9:20 – 9:40	**[C13]** **The making of a natural kind: An ethnoprimatological research of the Yunnan snub-nosed monkeys (*Rhinopithecus bieti*) in a century** Danhe Yang Sun Yat-sen University, China
9:40 – 10:00	**[C14]** **Impact of forest fire on orangutan feed fruit plants availability at the Tuanan Orangutan Research Station, Central Kalimantan** Fajar Saputra FORINA - The Indonesian Orangutan Conservation Forum
10:00 – 10:20	**[C15]** **Insect feeding behavior of Sumatran orangutan (*Pongo abelii*) at Ketambe Research Station, Gunung Leuser National Park, Indonesia** Rina Mutia Leuser Conservation Forum, and Department of Biology, Faculty Sciences, Indonesia
10:20 – 11:00	**COFFEE BREAK** (G6 Building)

SESSION 11:00 – 12:20

THEME: Conservation of gibbons

Room A (Building G2) - Chair: Dilip Chetry

11:00 – 11:20	**[A16]** **Swinging though family trees: Utility of three mitochondrial DNA loci for the phylogenetic identification of species and hybrids in gibbons** Lauren Lansdowne University of Leicester, UK
11:20 – 11:40	**[A17]** **Science and Strategy for Saving the Small Apes: Lessons Learnt and to Share** Susan M Cheyne IUCN/SSC Primate Specialist Group - Section on Small Apes
11:40 – 12:00	**[A18]** **The development of a 'Conservation Action Plan' for gibbons in Indonesia** Rahayu Oktaviani The Association of Indonesian Primatologists (PERHAPPI)
12:00 – 12:20	**[A19]** **Hainan gibbon conservation in a human landscape – challenges and opportunities** Heidi Ma Zoological Society of London, Institute of Zoology

THEME: Conservation

Room B (Building G2) – Chair: Hoang Van Sam

11:00 – 11:20	**[B15]** **Evaluating distribution, genetic diversity and species distribution under climate change scenarios** Bheem Dutt Joshi Zoological Survey of India, Kolkata, West Bengal, India
11:20 – 11:40	**[B16]** **Management approaches to primate conservation in India** Mridula Singh University of Mysore, Mysore, India
11:40 – 12:00	**[B17]** **Estimation of suitable habitat and population density for some threatened primates in Barail Wildlife Sanctuary, Assam, India** Parthankar Choudhury Assam University, Silchar, India

12:00 – 12:20	**[B18]** **Status of Primates in Doomdooma Forest Division in the state of Assam, India** Dilip Chetry Aaranyak, India
THEME: Conservation	
Room C (Building G2) - Trinh Dinh Hoang	
11:00 – 11:20	**[C16]** **The Sela macaque (*Macaca selai*): a distinct phylogenetic species that evolved from the Arunachal macaque following allopatric speciation** Avijit Ghosh Zoological Survey of India
11:20 – 11:40	**[C17]** **Using bioacustics to monitor gibbons** Vu Tien Thinh Department of Wildlife, Faculty of Forest Resource and Environment Management, Vietnam National University of Forestry, Xuan Mai, Hanoi, Vietnam.
11:40 – 12:00	**[C18]** **The effectiveness of using SMART program in forest patrolling and monitoring of the grey-shanked douc langur (*Pygathrix cinerea*) in Kon Ka Kinh National Park, Gia Lai Province, Viet Nam** Nguyen Ai Tam Frankfurt Zoological Society in Vietnam
12:00 – 12:20	**[C19]** **Status and Community-based conservation of the Delacour's langur (*Trachypithecus delacouri*) in Kim Bang Forest and Lac Thuy-Huong Son Area, Vietnam** Le Thanh An Center for Nature Conservation and Development (CCD), Vietnam

12:20 – 14:00	**LUNCH**

SESSION 14:00 – 15:00

THEME: Conservation

Room A (Building G2) – Chair: Frank Momberg

14:00 – 14:20	**[A20]** **Conserving Primates in Myanmar: Research Gaps and Recommendations** Carolyn Thompson University College London & ZSL's Institute of Zoology
14:20 – 14:40	**[A21]** **Discovery of the skywalker gibbon (*Hoolock tianxing*) in Myanmar** Pyae Phyo Aung Nature Conservation Society (NCS), Myanmar
14:40 – 15:00	**[A22]** **Spatial distribution of Phayre's Langur (*Trachypithecus phayrei*) in Southeast Bangladesh** Sabit Hasan Biodiversity Research and Conservation Unit, Isabela Foundation, Bangladesh

THEME: Conservation

Room B (Building G2) – Chair: Rina Mutia

14:00 – 14:20	**[B19]** **Assessment of Orangutan (*Pongo pygmaeus wurmbii*) habitat and populations within customary forests in West Kalimantan, Indonesia** Sulidra Fredrik Kurniawan Yayasan Palung / Gunung Palung Orangutan Conservation Program
14:20 – 14:40	**[B20]** **The importance of sengkuang trees (*Dracontomelon dao*) in the small forest fragmented for the Bornean Orangutans (*Pongo pygmaeus morio*) conservation** Ari Mujahidin Faculty of Forestry Mulawarman University East Kalimantan, Indonesia
14:40 – 15:00	**[B21]** **Soil-transmitted helminths in wild Bornean Orangutans (*Pongo pygmaeus wurmbii*)** **Ishma Fatiha Karimah** Yayasan Palung/Gunung Palung Orangutan Conservation Programme, Indonesia

15:00 – 16:00	**POSTER SESSION & COFFEE BREAK (G6 Building)**

CLOSING CEREMONY 16:00 – 16:30

Thursday 17th November

	DEPARTURE
09:00 – 10:30	Transportation to Hanoi city and Noi Bai International Airport

7. ABSTRACTS

ROOM A

A1 [13 November, 11:00 – 11:20]

Neglected night: unveiling threats of 'Endangered' Bengal slow loris (*Nycticebus bengalensis*) using 'Local Ecological Knowledge' in northeast India

Nabajit Das[2,3]
Gauhati University, B. H. College, Assam, India
<nabajit88@gmail.com> <nabajit_das1@rediffmail.cm>

Abstract
The distribution range of 'Endangered' Bengal slow loris (*Nycticebus bengalensis*) in India is confined to Northeast India. The combination of being strictly nocturnal makes the species sensitive to any changes in their habitat. Scanty data are available from this region about the use of slow loris in traditional medicine, hunting and its trade. We carried out research on the status of this species in Changlang District, Arunachal Pradesh through 'Local Ecological Knowledge' (LEK) survey. LEK is increasingly seen as an important tool for the conservation of threatened species. We aimed to gain LEK through questionnaire surveys and semi-structured face-to-face interviews with villagers (n = 642) and traditional healers (n = 38) during 2017 to 2019. More than 85% of respondents recognize the species, and 72% indicated that populations were decreasing. Almost half of the interviewees (47%) indicated that hunting occurred regularly and an additional 18% occasionally. Acceptance of the practice of their use in traditional medicinal beliefs is high (67%). Only 16 % of the interviewees indicated that hunting was primarily for meat. A total of 11 slow loris body parts were identified as being used for the treatment of 17 different ailments respectively. Continuous threat assessment is urgently required and large-scale LEK surveys can strengthen the robust conservation action and management plans for this nocturnal species as they received little attention despite threats from habitat loss, illegal wildlife trade and hunting.

A2 [13 November, 11:20 – 11:40]

Eco-friendly livelihoods in exchange for safe slow lorises (*Nycticebus coucang* and *N. hilleri*) and other wildlife in Sumatra

Frantisek Pribrsky
Ostrava Zoo, Czech Republic
<pribrsky@zoo-ostrava.cz>

Abstract
The Kukang Rescue Program fighting the illegal trade in slow lorises on the Indonesian island of Sumatra started engaging local communities in wildlife conservation while at the same time supporting their sustainable livelihoods. Within the new "Kukang Coffee" project, in cooperation with coffee farmers of established "Kukang Coffee Community", representatives of the rescue program introduced a methodology for cultivation and processing of high-quality eco-friendly coffee. As part of their membership, the farmers receive proper advice and training in the harvesting and processing of coffee beans that the program consequently buys from them at a price that is higher than on the local market. In return, individual members of the community are required to make a legally binding promise that they and their families will protect endangered and protected animals and abide by the ban on their hunting. In addition those farmers receive advice from a team consisting of a coordinator and two assistants who used to be poachers. However, those ex-poachers now control not only the processing of coffee according to the set methodology, but also compliance with the ban on hunting endangered animals. Since 2020, more than 50 farmers from three villages have been cooperating with the Kukang Coffee project. Thanks to the project, farmers make a significant profit from nature conservation and same time actively protect slow lorises and other threatened wildlife in the forest around the village. Thanks to the project the area around Kuta Male village has become such a small paradise for these animals.

References
http://www.kukang.org; http://www.trenggiling.org; http://www.stolenwildlife.org

A3 [13 November, 11:40 – 12:00]

Surviving in the village matrix: Social organization and group dynamics of western Hoolock gibbons (*Hoolock hoolock*) in a community conserved village population of Assam, India

Jihosuo Biswas
Primate Research Centre NE India
<jihosuo@yahoo.com>

Abstract
Deforestation and rapid conversion of forests to farmland and human settlement in Upper Assam, India had led to the habitat fragmentation and isolation of western Hoolock gibbon (*Hoolock hoolock*) families to remnant patches in village areas. Linear infrastructure development exacerbated these effects. Many gibbon families have perished due to resource scarcity and conflict with development; however, the villages of the Barekuri area in Upper Assam have retained a substantial number of gibbon families for many years due to community support. Monitoring these families provides not only evidence of changes in population size, but also the interplay among demography, group dynamics, and the life history parameters of individuals. Here we presented long-term data (from 2011 to 2020) on social organization and its dynamics in the Barekuri village population (nine gibbon families). We recorded twelve births, fourteen deaths, and six dispersals in the population. Seven of the fourteen deaths were due to electrocution, reducing the population size from 29 individuals in nine groups in 2011 (3.22±0.67SD) to 21 individuals in seven groups and one lone individual in 2020 (2.86±0.65SD), with the mean group size did not vary significantly over the years. Female inter-birth intervals and ages at first reproduction are comparable with those in wild populations. Both males and females took the opportunity to form groups and breed. Male replacement, female philopatry, and surrogacy indicated flexibility in a pair bond. Our observations thus support a growing knowledge of variability in the social organization of gibbons in the human anthropocene.

A4 [13 November, 14:00 – 14:20]

Community-led conservation action for gibbons at Jahoo, Cambodia

Hélène Birot
World Hope International, Cambodia
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Abstract
Listed as 'Endangered' by the IUCN Red List of Threatened Species, the southern yellow-cheeked gibbon (*Nomascus gabriellae*) has been declining due to loss of forest habitat and hunting. In Cambodia, the largest population of this species is found in Keo Seima Wildlife Sanctuary (KSWS) on land that is partially owned and protected by a marginalized indigenous community, the Bunong. To protect this final refuge for the species, World Hope International is working with the community to support Jahoo, a community-owned ecotourism initiative. Families of gibbons, living within the community protected forest, are being habituated for wildlife-based ecotourism and conservation research, providing a unique insight into daily gibbon life and behavior. This project has developed into a successful community-based venture demonstrating both significant community development and gibbon conservation impact. Jahoo promotes sustainable wildlife-friendly livelihoods for the Bunong people, reconnects youth with nature, and encourages community-led conservation action, whilst developing conservation research to better understand the behavioral ecology of the southern yellow-cheeked gibbons and creating a space for indigenous leadership to protect ancestral natural resources. The challenge now for Jahoo is to (1) maintain and scale-up gibbon habituation, ecotourism operations, community-led conservation action and capacity building of local staff and community leadership, and (2) diversify the business model with new partnerships and develop Jahoo into a globally important site for gibbon conservation research through new academic collaborations.

A5 [13 November, 14:20 – 14:40]

Learning to love and live with gibbons: A case study of amicable human-primate relationships from Assam, India

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Abstract
The complexity of human—animal relationships is particularly evident through human—nonhuman primate interactions in multicultural landscapes like India. In this study, we focus on the multifaceted interactions between people of Barekuri in Assam, India, and the 'Endangered' Western Hoolock Gibbon (*Hoolock hoolock*) by tracing people's emotive and affectual geographies, and collecting individual gibbon ethnographies. Barekuri has undergone rapid land-use changes – from being formerly densely forested to presently housing a matrix of monocultures. Thus, its historically-resident population of gibbons now remains trapped in a disconnected human-dominated region. This has resulted in the evolution of unusual interspecies interactions which we have been studying and documenting through novel mixed-methods and interdisciplinary tools.
Today, local communities regularly provision these rare apes, which in turn, have become increasingly and uncharacteristically habituated to human presence – resulting in a unique system of co-dependency and near-domestication. People have a deep and cultural affection for the gibbons, arising from a sense of kinship, awe and responsibility towards their wellbeing. While these relationships seem positive at first, they raise concerns about the long-term survival of this dwindling population of gibbons. These gibbons also face anthropogenic threats including oil mining, risk of electrocution from electric cables and increasing habitat loss, adding pressure to an already-fragile system.
Having identified some of the key factors driving human—gibbon relationships in Barekuri, this work has also proven to be a valuable case study in the use of human and nonhuman ethnographies in understanding the intricate nature of interspecies interactions for effective and context-specific conservation practice.

A6 [13 November, 14:40 – 15:00]

Giving up gibbons: Using social media posts to understand the motives behind the surrender of gibbon pets in Indonesia

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Abstract
All Indonesian gibbons or small apes (Hylobatidae) are considered 'Endangered' with threats including habitat loss and the illegal trade. Despite their protected status, gibbons remain a highly sought-after pet. In recent years, many pet gibbons have been surrendered to Indonesia's Division of Natural Resources Conservation (BKSDA), which could be the result of increased public awareness. A better understanding of the motives behind these handovers could enable more targeted demand reduction campaigns in the future. We collected and analysed BKSDA Instagram posts and local media reports from 2016 to 2022 containing information of gibbon handovers. From the 119 posts obtained, 135 gibbons comprising six species from Sumatra (61%), Kalimantan (32%) and Java (8%) were surrendered over this period. Since 2016, the annual number of gibbons received by BKSDA steadily increased. From the 52 posts that contained information on handover motives, more than 80% indicated legal reasons and the remainder could be attributed to difficulties in handling the gibbon. Although often considered ineffective in mitigating trade, here we found law enforcement (direct or persuasive) and fear of the law to be the main reasons given for the handover of gibbons. Widely publicising successful law enforcement cases of gibbon trade through media campaigns could help to deter future buyers and reduce demand. More adequate and consistent penalties for possession of protected species may also help to discourage owners from simply offloading their pet gibbons to the authorities without consequence when the animal becomes too difficult to handle or it becomes a burden.

A7 **[13 November, 15:00 – 15:20]**

The impact of the Covid-19 pandemic: Learning from the story of Javan gibbon (*Hylobates moloch*) conservation

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Abstract
The Coffee and Primate Conservation Project was initiated in 2012 to conserve the Javan gibbon (*Hylobates moloch*) in Central Java, Indonesia. The project has developed a sustainable conservation scheme by promoting shade grown coffee as a commodity to improve livelihoods and community conservation. Coffee production has been a useful way to promote the Javan gibbon amongst consumers in both local and regional markets. Export of the coffee to Singapore has raised USD 10,000–15,000 annually to support community participation in coffee production and forest protection. However, since March 2020 the coffee supply chain has been disrupted by the uncertain market conditions resulting from the COVID-19 pandemic, and the closure of a cafes resulted in a decline in demand for the coffee, conservation fund no longer available. From this experience, the Project has recognized that it is important to consider the choice of agroforest commodities based on their resilience and to reduce dependency on a single commodity. Other forest products will need to be developed that have added conservation value.

A8 [13 November, 16:00 – 16:20]

Orangutan conflict cases in East Borneo, Indonesia

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Abstract
Orangutan conflicts in Indonesia, especially in East Kalimantan are increasing day by day. Orangutan conflicts can have a negative impact on both humans and orangutans, i.e. economic losses, injured orangutans, or even orangutan death. The Centre for Orangutan Protection created Animal People Environment (APE) Crusader team that was tasked with conflict mitigation, also evacuating and rescuing orangutans from conflict areas.
From June 2020 to June 2022, the APE Crusader team assessed and handled 92 cases of orangutan conflict in East Kalimantan involving 128 orangutans. Most cases occurred on the roadside where orangutans were often seen crossing (42.4%). Cases also occurred in mining concessions (26.1%), human settlements (14.1%), community plantations (12%), and palm oil plantations (5.4%).
In the past two years, the team has succeeded in rescuing 4 orangutans from illegal possession and 1 juvenile orangutan that was stranded on a rubber plantation. APE Crusader also translocated 4 wild orangutans to protected forests. No orangutans were found dead in the conflict 2020 to 2022. COP and authorities will build corridors in conflict-prone areas to reduce the number of orangutan conflicts in the future.

A9 [13 November, 16:20 – 16:40]

Primate deaths due to electrocution: a case in Petungkriyono forest, Indonesia

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Abstract
Forest in Petungkriyono, is one of the last remaining lowland rainforest in Central Java. The area consists of lowland and mountain forest, this forest is a home for five species of primates, some of them are endemic. The electricity network from the electricity state company was built in the area in 2019 to support community. Unfortunately, the construction of the electric cables was without insulation. It caused the primates to die by electrocution. Based on observations and reports from the local community, there were 10 individual of primates who died since June 2019 to April 2022. Those are 4 individuals of Javan langur (*Presbytis comata*), 5 individuals of East Javan langur (*Trachypithecus auratus*) and 1 individual of silvery gibbon (*Hylobates moloch*), where all these primates are protected by Indonesian law. Here we share our collaborative effort on forest management in Petungkriyono to prevent primate deaths due to electrocution through stakeholder communication, social media campaign and advocate to implement primate-friendly electricity installations. Regular monitoring of the power cable network and replacement to insulated cables are solutions to prevent the death of primates from electrocution. Communication between parties, through collaborative forest management forum and technical officers still needs to be improved for the implementation of primate-friendly infrastructure.

A10 [13 November, 16:40 – 17:00]

Online trade in Indonesian primates

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Abtract
Indonesia is home to more than 60 extant primate species and ranks among the top three most species-rich countries in the world. It is well known that many of these species are under immense pressure by rampant poaching, either for the pet trade or for consumption. Along with habitat destruction, the pet trade nowadays poses the biggest risk to the survival of Indonesian primate species. In recent years this trade has moved from Indonesia's infamous animal markets to various online platforms. This shift has made trade monitoring more complex and might muffle the true volume of individuals and species trade within Indonesia. Only with increased trade monitoring and targeted conservation efforts, some of Indonesia's most threatened primate species will stand a chance to avoid extinction.

A11 [13 November, 17:00 – 17:20]

The expansion of the illegal primate trade in Indonesia

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Abstract
The illegal wildlife trade is one of the main threats to wildlife conservation in the world. The value of this crime has been estimated at between $7 and $23 billion per year and involves well-organized criminal networks. In 2012, the Centre for Orangutan Protection established the Animal People Environment (APE) Warrior team to combat illegal wildlife trades. For the past ten years, the APE Warrior team has investigated and assisted in 47 operations of wildlife trader arrests in Indonesia. We helped law enforcers to arrest at least 51 suspects, with prison sentences varying from 4 months to 2.5 years. The arrest operations were scattered in 12 provinces in Sumatra, Java, and Kalimantan Islands. East Java and Central Java are provinces with the most illegal trafficking cases with 14 (30%) and 10 (21%) cases, respectively. Our team contributed to the rescue of at least 235 wildlife animals from 50 wildlife species. Seventy-four primates from ten species were rescued from smuggling, i.e. 27 Javan leaf-monkeys (*Trachypithecus auratus*), 28 Sumatran and Javan slow lorises (*Nycticebus coucang* and *N. javanicus*), nine Sumatran orangutans (*Pongo abelii*), one Bornean orangutan (*P. pygmaeus* [*morio* ?]), three Sulawesi macaques (*Macaca hecki*), two tarsiers (*Cephalopachus bancanus*), two siamangs (*Symphalangus syndactylus*), one agile gibbon (*Hylobates agilis*), and one Sumatran surili (*Presbytis melalophos*). One Bornean orangutan was moved to COP's orangutan rehabilitation centre in Berau, East Kalimantan. The other rescued primates were translocated to various wildlife rescue and rehabilitation centers around Indonesia. Collaboration between the government, law enforcers, and NGOs must continue to strengthen law enforcement in wildlife trade cases in Indonesi

A12 [16 November, 09:00 – 09:20]

Unlocking museum collections for primate phylogenetics and conservation: Case studies from lorisiform primates

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Abstract
Our understanding of primate evolutionary history, diversification, and conservation status is often limited by our ability to obtain high quality data from wild populations. This task has been particularly difficult for small, nocturnal, and elusive species like the lorisiforms (galagos, lorises, and pottos). For these endangered primates, an assessment of genetic relationships can improve taxonomic resolution and inform conservation efforts. Here, we present a case study that leverages vast museum collections to improve our knowledge of the evolutionary history and conservation status of lorisiforms. Our mtDNA sequencing of slow lorises (*Nycticebus*) including museum specimens (n=153, 2,835 bp per sample) enabled the most extensive geographic sampling coverage to date for this group. The results of these analyses suggest the potential for some taxonomic revisions and cryptic diversity. Lessons learned from these case studies include pervasive issues of specimen mislabeling or missing information, the impacts of specimen age and type on DNA concentration and sequencing success, and the enormous potential of museomic approaches for advancing studies of primate evolution and conservation.

A13 **[16 November, 09:20 – 09:40]**

The importance of genetic data from name-bearing type specimens

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Abstract
The formal description of a new species is commonly based on at least one specimen. This specimen, the holotype, or in the case of several designated specimens, the syntypes, have name-bearing function for the newly described species. However, available type material, sometimes centuries old, may not allow a visual taxon identification (anymore) or given type localities are sometimes unprecise or even wrong. Advances in molecular genetics, i.e. high-throughput sequencing, offer the opportunity to analyze even highly degraded DNA as typically extracted from museum specimens. I will present mitogenomic data from name-bearing type specimens of several Asian primates (genera *Nycticebus*, *Trachypithecus*, *Presbytis*, and *Nomascus*) and discuss their taxonomic and biogeographic implications. Overall, museum specimens, particularly name-bearing types, are a valuable genetic and genomic source and of great importance for taxonomic research.

A14 [16 November, 09:40 – 10:00]

Genomics of ecological and behavioural adaptation in primates

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Abstract
Non-human primates predominantly inhabit tropical, sub-tropical and temperate regions. They are also widely adaptable and occupy a wide range of habitats including forests, savannahs, mangroves and semi-deserts. They are ecologically flexible and variable and also in their behaviour. From literature overview of genomic studies about various primates and their adaptations we can narrow down the specific positively selected genes and pathways responsible. Some adaptations may help in adjusting to the environment, like food habitats or adaptation to high altitude. Many species adjust their feeding habits according to their surroundings based on food availability. These can be clearly observed when subpopulations of the same species are found in two drastically different environments with different landscapes, flora and fauna. In majority of the cases primates adapted to altitude have positive selection on genes related to haemoglobin pathway. Behavioural adaptations can be observed as more tolerance towards other males in a male-philopatric social organisation or as night vision in certain primates or adaptation for efficient locomotion in their respective habitats. Most behavioural adaptations can be observed as some kind of positive selection in neurological pathways.

A15 **[16 November, 10:00 – 10:20]**

Conservation genomics of one of the most threatened primates, the Cat Ba langur (*Trachypithecus poliocephalus*), reveals genomic adaptation to saltwater consumption and small population size

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Abstract
Many mammal species are threatened with extinction or have declining populations, but the consequences of large-scale population size reductions on the genomic make-up of species are yet not much explored. We here investigated the population history and genetic load of the Cat Ba langur (*Trachypithecus poliocephalus*), a primate species endemic to Vietnam's famous Halong Bay and with approximately only 70 individuals one of the most threatened primates in the world. Using whole genome data at high coverage of four wild individuals we revealed a dramatic 5-fold decline in effective population size over the last 100 years. Compared to other endangered primates and mammals, the Cat Ba langur showed extremely low levels of genetic diversity and the longest runs of homozygosity, indicative of small population size and recent inbreeding. We further detected several loss of function genes that likely increased the tolerance to saltwater consumption and missense variants in genes related to calcium pathways implying that Cat Ba langurs are even better adapted to karst habitat than other species of limestone langurs. Our results show that Cat Ba langurs are perfectly adapted to their island habitat and small population size, and although exhibiting low overall genetic diversity.

A16 [16 November, 11:00 – 11:20]

Swinging though family trees: Utility of three mitochondrial DNA loci for the phylogenetic identification of species and hybrids in gibbons

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Abstract
Accurate species classification of individual gibbons can be problematic, especially for juveniles, and where closely related species share similar morphology. This difficulty is further compounded by the existence of intra-generic hybrids, which occur naturally in contact zones, as well as in the captive setting. However, correct identification of individuals remains crucial to conservation efforts such as captive breeding programmes, and releasing animals to the wild. Phylogenetic methods offer a means to genetically identify the species of an individual. We assessed the utility of the mitochondrial D-loop region for gibbon species identification, sequencing 194 individuals from 11 species, from EAZA institutions and samples held at the University of Tokyo. These were supplemented with publicly available sequences for a further 5 species. We compared the D-loop performance to two other mitochondrial genes: cox1, commonly referred to as a 'DNA barcode'; and cytochrome b, a commonly used phylogenetic marker. We found the more variable D-loop provides higher resolution than the other loci, in particular for resolving the *Nomascus* genus, for which not all species were monophyletic when analysing cytochrome b. Furthermore, we detected five cases of introgression, demonstrating the utility of such methods in identifying cryptic hybrids. These data can allow for appropriate management decisions to be made regarding possible breeding and release of individuals. This approach, using multiple loci with different phylogenetic discrimination, will support conservation efforts by maintaining the genetic integrity of both wild and captive gibbon populations.

A17 [16 November, 11:20 – 11:40]

Science and Strategy for Saving the Small Apes: Lessons Learnt and to Share

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Abstract
Gibbons (Hylobatidae) are small arboreal apes known predominantly for their stereotyped songs. However, compared to the great apes, the gibbons and siamang have received significantly less conservation attention, despite existing in 10 countries and covering 20 species. Established in 2014, the SSA works to fulfil several functions: 1) using science for conservation for gibbons, 2) sharing experience and expertise to promote gibbon conservation, 3) engaging with the general public around the world, 4) leveraging funds for gibbon conservation, 5) to focus on the illegal wildlife trade in gibbons and how best to tackle this, 6) to create useful best practice guidelines for practitioners and to engage with governments and private sector (where appropriate) and 7) to respond to emerging issues in gibbon conservation as identified by our members. We present here the work done since 2014, current initiatives and results and future plans: 20 actions to save the 20 species. We share success and results and outcomes and actions and also where we met limitations in the hope that some of the experiences of the SSA can be applied to other primate species. The SSA will remain flexible to respond to emerging gibbon conservation needs and will ensure engagement with the SSA membership when developing plans and outcomes.
Finally, all these data need to be shared to highlight the importance of public outreach for science communication including online sessions, magazines, social media, children's clubs, school visits, public events etc.

A18 [16 November, 11:40 – 12:00]

The development of a 'Conservation Action Plan' for gibbons in Indonesia

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Abstract
Nine of 20 gibbon species live in Indonesia, distributed on the three main islands: Bornean white-bearded gibbon (*Hylobates albibarbis*), Müller's gibbon (*H. muelleri*), East Bornean gray gibbon (*H. funereus*), and Abbott's gray gibbon (*H. abotti*) on Kalimantan. Siamang (*Symphalangus syndactylus*), Lar gibbon (*H. lar*), Agile gibbon (*H. agilis*), Kloss's gibbon (*H. klossii*) on Sumatra, and Javan silvery gibbon (*H. moloch*) on Java. The IUCN Red List of Threatened Species categorized all gibbon species as 'Endangered'. By Indonesian law seven are protected, while the Bornean gray gibbon (*H. funereus*) and Kloss's gibbon (*H. klossii*) are not protected yet. In addition, there is currently only one national conservation action plan that exists for the Javan silvery gibbon (*H. moloch*).
To provide direction and guidance on the strategies and priorities for Indonesian gibbon conservation, the association of Indonesian primatologists (PERHAPPI), supported by the IUCN SSC/PSG Section Small Apes, has drafted a conservation action plan through several meeting series, from webinars in December 2020 to a stakeholder workshop in December 2021. We integrate and update the scattered information by joint forces and bringing together representatives of government authorities, academians, researchers, and gibbon practitioners in Indonesia.
As the outcome, we present ten conservation priorities interconnected main issues related to the conservation of Indonesian gibbons *in-situ* and *ex-situ*: 1) habitat suitability, 2) climate change, 3) forest fires risk, 4) infrastructure development, 5) distribution of research sites, 6) economic value in gibbons habitat, 7) zoonoses, 8) green infrastructure and forest corridors, 9) illegal trade, and 10) distribution of release sites and rehabilitation centers. We expect this document to provides a collective call for concrete action to protect nine gibbon species in Indonesia.

A19 **[16 November, 12:00 – 12:20]**

Hainan gibbon conservation in a human landscape – challenges and opportunities

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Abstract
The Hainan gibbon (*Nomascus hainanus*), the world's rarest primate, is restricted to a single population within Bawangling National Nature Reserve, China. This landscape was historically used by Li and Miao minority communities; an exclusion policy following reserve establishment led to conflict with local people who desire legal access to natural resources, and ongoing human disturbance is a possible reason for limited gibbon recovery. We engaged with communities around Bawangling to understand local knowledge and attitudes toward gibbons, and evaluate effectiveness of past conservation efforts. Considerable traditional ecological knowledge about gibbons (e.g. folktales) exists amongst older community members, which could form the basis for promoting local 'cultural ownership' of gibbon conservation. However, most interviewees did not understand extinction or its drivers, indicating that conservation messaging focused around gibbon extinction risk may be ineffective. Interviewees knew more about gibbon conservation if they had been exposed to village education sessions and conservation-themed billboards, whereas other activities (e.g. outreach for schoolchildren) have been less effective. Whereas interviewees tended to remember the medium of past outreach activities and who delivered them, few could remember specific conservation messages, with greater recall of negatively-framed messages. These findings provide a new baseline for integrating Indigenous voices into conservation.

A20 [16 November, 14:00 – 14:20]

Conserving primates in Myanmar: Research gaps and recommendations

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Abstract
Myanmar is one of the world's most biologically-rich regions. Yet, many of its ecosystems are threatened and there is an urgent need for greater wildlife conservation effort, particularly for its 20 primate species – over half of which are either 'Endangered' or 'Critically Endangered'. We conducted a systematic literature review between 01/01/1900 and 23/09/2021 in "All Databases" in Web of Science and Google Scholar using PRISMA guidelines and strict search criteria to examine the history and breadth of primatology in Myanmar. Complementarily, we also conducted five semi-structured interviews with established academics and professionals working in primate conservation in Myanmar to examine current primate research and on-going conservation efforts, as well as obstacles for students and researchers thinking of pursing primatology. The systematic literature review found 76 relevant articles between 1937 and 2021, of which, 51% were on fossil primates, 17% on macaques (*Macaca* spp.) and 15% on hoolock gibbons (*Hoolock* spp.). The first primate distribution record and direct observational studies were not published until 1967 and 1990, respectively. Of the 20 primate species, 15 were found to have insufficient population and distribution information. In addition, only 9% of publications were led by Myanmar nationals, with the first first-authored paper published in 1979. The semi-structured interviews highlighted the academic and logistical challenges both students and professionals face in Myanmar, including a lack of funding and primate-focused education opportunities. Based on these findings, we present clear knowledge gaps and recommendations for the development and support of primatology in Myanmar.

A21 **[16 November, 14:20 – 14:40]**

Discovery of the skywalker gibbon (*Hoolock tianxing*) in Myanmar

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Abstract
Skywalker gibbons (*Hoolock tianxing*) are an endangered species with an estimated 150 known individuals discovered in southwestern China. Their distribution is predicted to extend into eastern Myanmar; however at the time of the IUCN Red List assessment, this was yet to be confirmed. In 2019, the Myanmar Skywalker Gibbon Conservation Committee was formed in collaboration with Myanmar and international stakeholders to assess the presence of skywalker gibbons in the country. Five skywalker gibbon groups were discovered during the field surveys from December 2021 to March 2022,, east of the Ayeyarwaddy River in the Paung Laung Reserve Forest and Mae Nei Taung forests located in southern Shan State at the elevation of 800~1750 meters. In addition, monitored groups, previously thought to be eastern hoolock gibbons (*Hoolock leuconedys*) were confirmed to be skywalker gibbons by both morphological and DNA identification in northern Kachin State. Our findings confirm the extension of the skywalker gibbon range into Myanmar. Additional population surveys are needed to determine the southernmost border of the home range. New gibbon locations in Shan State are threatened by illegal logging and hunting pressure. These study sites are important areas for the conservation of not only skywalker gibbons but also other endangered wildlife in Myanmar, and urgent action is needed to conserve these forests areas and expand and increase forest fragment connectivity.

A22 [16 November, 14:40 – 15:00]

Spatial distribution of Phayre's langur (*Trachypithecus phayrei*) in Southeast Bangladesh

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Abstract
Phayre's Langur (*Trachypithecus phayrei*) is an 'Endangered' colobine primate having a limited distribution in eastern Bangladesh, northeast India, and northwestern Myanmar. In Bangladesh, it is a Critically Endangered species and occurs in mixed evergreen forests in the northeast and hill forests in the southeast. But there is a lack of spatial distribution data, especially in the southeast. We surveyed a total of 24 forest patches in southeast Bangladesh between January 2015 to November 2021 to gather the presence/absence data of the langur walking in pre-established forest trails and conducting informal questionnaires among fringe villagers. We encountered 23 groups in 15 forest patches and the group sizes ranges from 2 to 14 individuals. In 7 patches distribution were cleared by questionnaire survey and in 4 patches distribution were unclear. Phayre's Langur was extirpated from several (n=4) patches due to extensive hunting for meat and indigenous communities still hunt wildlife in a total of 21 sites. Using the sighting records in MaxEnt, we modeled the potential distribution of the species to find other suitable habitats in Bangladesh. The vegetation cover, annual precipitation, elevation and mean temperature influenced the distribution. It showed about 1400 km^2 ofhighly suitable and about 6000 km^2 of moderately suitable area for Phayre's langur in Bangladesh. Among them Southeast covered about 980 km^2 of highly suitable and about 5700 km^2 of moderately suitable area. Hence, we recommend specific options to manage and protect the langur population in the 15 sites. Besides, we suggest conducting comprehensive surveys in all potential sites to assess the distribution and population status, and threats to initiate appropriate conservation actions for the last remaining Phayre's langur in southeast Bangladesh.

ROOM B

B1 [14 November, 11:00 – 11:20]

Competition and conflict resolution: Perspective of Nicobar long-tailed macaque (*Macaca fascicularis umbrosus*)

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Abstract
Competition and conflict are inescapable when resources are limited, however there needs to be a mechanism for resolving the conflict and maintain positive relationships. Our study explored the aggression and conflict resolution patterns within a group of Nicobar long-tailed macaques (*Macaca fascicularis umbrosus*) in Great Nicobar Island, India. We found males to be more aggressive than females agreeing to the socioecological theory. Conciliatory tendency among the males was comparable to rhesus macaques (*Macaca mulatta*), a phylogenetically close species, but were expectantly lower than females of the group. Our results are consistent with previous studies which demonstrated that stronger relationships and low intensity aggression had better probability of reconciliation. Another facet of conflict was studied by understanding farmers' perception towards the macaques on the islands. Increased co-dependency on coconuts by humans and macaques after 2004 tsunami seemed to have led to competition and conflict. Macaques avoided humans during crop-foraging and preferred rainy season and low light conditions. The lack of market for their crops and having small land holdings has further increased the intolerance in farmers towards the macaques. However, lethal methods were not suggested for mitigation by the farmers. Conflicts are always in the flux and so are the anthropogenic impacts on the islands. Recent developments on the island threaten to increase competition for resources within macaques as well as between humans and macaques. This would require long-term study and empathetic interventions for better mitigation of conflicts.

B2 **[14 November, 11:20 – 11:40]**

A multi-method approach to study individual personality among Rhesus macaques (*Macaca mulatta*) in an anthropogenic setting

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Abstract
Rhesus macaques (*Macaca mulatta*) are one of the highly adaptable species of nonhuman primates. In the past decade, a dramatic growth in their population has been observed, especially in the Indian subcontinent. To investigate the difference in the patterns of their sociality in anthropogenic setting, it is pertinent to understand the individual as a unit. It is well established now that animals exhibit different personalities. However, despite its popularity, very few studies have been conducted on the individual differences in this aspect on urban macaques due to concerns around its "subjective biasness". Through this paper, I will discuss the utility of multi-method approach to study such differences in nonhuman primates. Further, I will examine whether differences in personalities can influence the behavior of macaques in social situations. The observations are a part of an ongoing project on a group of urban dwelling rhesus macaques at Kamla Nehru Ridge in Delhi, India. Focal event sampling has been used to observe the behavior of a group comprising of 10 adult males and 43 adult females. In addition to this, noninvasive experiments were used to measure their personalities in a nonsocial context, based on previous studies conducted on captive macaques. The experiments were divided into four categories each representing separate measure of behavior. This study is an attempt to combine observational and experimental method, on a field based setting, to assess individual personalities in rhesus macaques. Subsequently, this multi-method approach aims to offer insights on the evolution of individual differences and macaque sociality.

B3 **[14 November, 14:00 – 14:20]**

Female behaviour after infant loss in bonnet macaques (*Macaca radiata*)

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Abstract
Mother-infant bond is the strongest relation that often lasts for whole life and shapes both the female and offspring behaviour in primates. Therefore, the death of the infant can trigger an emotional reaction in the mother, grief, which is characterised by active grief and passive depression. Our goal was to investigate how the behaviour of the females of bonnet macaques (*Macaca radiata*) changed after the loss of their infants. For two years, 2020 to 2022, we observed in Thenmala region of southern India 18 females from two groups that lost 25 infants. We found that the females that lost their infants were frequently seen on the periphery of the group and had fewer group members in close proximity to them. Moreover, they received less grooming and exhibited aggressive behaviour more often towards other individuals than while they were nursing live infants. Finally, we have also observed individual differences in grieving related to a females' personality. Nonhuman primates appear to react to mortality in a manner that is generally comparable to that of humans. The increasing understanding of how the deceased affect primates can therefore aid in our comprehension of the development of human notions and responses to death

B4 **[14 November, 14:20 – 14:40]**

Dietary diversity of the endemic lion-tailed macaques (*Macaca silenus*) of the Western Ghats, India: A review

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Abstract
Lion-tailed macaques (*Macaca silenus*) are endangered and endemic primates to the rainforests of the Western Ghats, India. The literature review of lion-tailed macaques spans 55 years (1967 to 2022) and covers 197 publications across the species' geographical range. Studies on captive and semi-free-ranging populations were excluded from the review. The specific objectives of this review were: (1) to document the identified food species from existing literature; (2) to review the spatial and temporal coverage of existing knowledge on food trees of wild macaques; (3) to examine the population-level variations in diets as well as to discuss their conservation-related implications. Geographic coordinates from publications for study locations or, if not provided from Google Earth (Google Inc. 2012). Certain plant species contribute to more than 65% of the macaques' diet. A previous compilation by Krishnamani and Kumar (2000) made a checklist of 218 species across 6 studies. However, the current study, compiled 400 food-plant species, excluding fungi, mushrooms, lichens, and animal matter. The macaques feed on a variety of animal matter to meet protein requirements including insects, frogs, bird eggs, and young ones of small mammals. This review also reveals important limitations regarding the lack of standardization in reporting the percentage of diet and regional gaps in studies. The review is an assessment of current knowledge about the diet of these species and draws attention to the potential importance of small-scale habitat heterogeneity for primate ecology and calls for studies between populations to understand the nuances of dietary diversity

B5 **[14 November, 14:40 – 15:00]**

Inter-individual differences predicting participation in intergroup conflict and its interplay with human-animal interactions in urban rhesus macaques (*Macaca mulatta*)

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Abstract
Anthropogenic areas, often having clumped and predictable resources, cause animal groups to congregate and compete over said resources, resulting in intergroup conflict (IGC). IGC is defined as aggressive interactions between individuals of different groups and can range from peaceful displacements to intense aggression. Participation in IGC is a culmination of individual differences in potential cost-benefit tradeoffs. As an artefact of the anthropogenic environment, between-species (human-animal) as well as within-species (e.g. IGC) interactions are often concentrated spatiotemporally, such that individuals might have to decide about participating in either or both interactions based on their needs. Such individual differences in IGC participation and its interplay with human-animal interactions in dynamic anthropogenic landscapes are practically unexplored. Using rhesus macaques (*Macaca mulatta*) inhabiting a temple site as a model for synanthropic primates, we investigated whether sociodemographic factors predicted IGC participation, and tested for any relationship between participation in IGC and human-macaque interactions. We found that males, subordinates and macaques who are more central in the coalitionary support network participated more in IGC. Surprisingly, we found that being central in both overall affiliative multilayer network and coalitionary support network negatively affected participation. We also found that individual rates of participation in human-animal interaction was negatively correlated with IGC participation, but rates of receiving aggression from humans was positively correlated with participation in IGC. This work highlights strong inter-individual differences in IGC participation and the possible feedback between human-macaque and macaque-macaque interactions, which might have profound downstream effects on within-group behavior, fitness, and disease transmission.

B6 **[14 November, 15:00 – 15:20]**

The effect of energetic costs on behavioral patterns in female Javan gibbons (*Hylobates moloch*) through reproductive status

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Abstract
In mammals, females have high energetic costs of reproduction such as for sexual cycling, pregnancy, and lactation. To deal with the reproductive costs, females have developed numerous behaviour strategies to manage feeding pattern and/or to reduce physical activity. In our long-term study, we examined how female Javan gibbons (*Hylobates moloch*) manage high reproductive costs in Gunung Halimun-Salak National Park, Indonesia between 2008 and 2021. We investigated the effect of reproductive status (cycling, pregnant, early and late lactating) of females on their activity budget (feeding time on fruits, feeding, resting, and traveling time), fruit intake rate, and daily path length. We found that both lactating and pregnant females consumed more fruits than cycling females, but there were no significant effects of reproductive status on the overall feeding time and intake rate. Our results demonstrate that Javan gibbon females increase time for consumption of high-quality foods as feeding strategy to deal with the higher nutritional requirements for reproduction. In addition, late lactating females spent more time resting and tended to spend less time traveling than females in other status without changing daily path length. Javan gibbon females compensate for high energetic requirement of carrying for heavier infants by reducing activities during late lactation period. Our study contributes to understanding the behavioural adaptations to manage the reproductive costs in the pair-living species with slow life history.

B7 **[14 November, 16:00 – 16:20]**

Observational learning from mother in immature wild Javan gibbons (*Hylobates moloch*)

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Abstract
Immature primates need to develop adult-level of foraging competency for survival during prolonged juvenile periods. Immatures may need to acquire social information from more experienced individuals by observational learning while co-foraging to improve foraging skills. Gibbons are placed in an interesting position since they face foraging difficulty and live in a small family group but have prolonged juvenile periods. Therefore, we examined the mother-immature interactions in feeding and non-feeding contexts in Javan gibbons (*Hylobates moloch*) in Gunung Halimun-Salak National Park, Indonesia (Dec 2019 to Jan 2022). We examined overlap in mother-immature diet composition and co-foraging time change as immatures aged. In general, immatures between 0.9 and 2 years of age spent 61% of their time co-foraging with their mothers. We found that the proportion of diet composition overlap and co-foraging time between mothers and immatures decreased as immature got independent. Then, we tested whether co-foraging time and the frequency of immatures approaching mothers in the feeding context increases with the foraging difficulty level, while one-quarter of food items were categorized as the highest foraging difficulty level. Immature spent more time with mothers and approached more in the feeding context than in the non-feeding context. Co-foraging time and the frequency of approaching mothers increased when immatures could not forage themselves because of the size or hardness of food items. Our results indicate that immature Javan gibbons can socially obtain information on foraging skills and food items by observing their mothers in close proximity during the dependency period.

B8 **[14 November, 16:20 – 16:40]**

How to be a good husband and father? A role of adult males in pair bond maintenance and parental care in Javan gibbons (*Hylobates moloch*)

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Abstract
In a pair-living species, female and male pairs should maintain stable social bonds through adjusting spatial and social associations. Nevertheless, each sex invests differently to maintain the pair bond, and it can depend on the presence of paternal care or 'male services.' While most of its species living in pair, the investing sex of the pair-bond maintenance in gibbons are still controversial. We investigated pair-bond maintenance and parental care in three pairs of wild Javan gibbons (*Hylobates moloch*) in Gunung Halimun-Salak National Park, Indonesia, for over 22 months. We found that grooming within Javan gibbon pairs was male-biased, suggesting that the pair maintenance of the Javan gibbons was heavily the job of males. It becomes even more male-biased when offspring become independent; probably to increase the mating opportunity since adult females will also resume cycling. Our results also highlight that Javan gibbon parents have a distinct role in parental care. Javan gibbon fathers groomed their offspring more than adult females, especially as offspring get older. While both parents increased playing time with offspring when offspring became older and more independent, fathers played with offspring 20 times more than mothers on average. Our study highlights that adult male Javan gibbons may have an important role in pair-bond maintenance and the care of juveniles.

B9 **[14 November, 16:40 – 17:00]**

Preliminary study of the home ranging behavior of eastern hoolock gibbon (*Hoolock leuconedys*) in Myanmar

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Abstract
The eastern hoolock gibbon (*Hoolock leuconedys*), is categorized as 'Vulnerable' on the IUCN Red List of Threatened Species. It occurs in Myanmar and in the state of Arunachal Pradesh in northeast India. Range use patterns are crucial to understanding the ecology, evolution, and conservation of primates. It is little known on the range use pattern of the eastern hoolock gibbon because few studies were carried out on the genus *Hoolock* to document its ranging pattern in Bangladesh, China and India. Rainging behavior of *H. leucondeys* was studied with three habituated groups in the Indawgyi Biosphere Reserve between 2019 and 2020. Indawgyi Biosphere Reserve covers 1,337 km^2 in Kachin State, northern Myanmar and supports significant forest habitat for the species. Ranging data, locations of the gibbon groups during travel and feeding were collected over 24 months by three researchers. Home ranges and core areas were calculated by three different methods; characteristic hull polygons (CHP), fixed kernel and minimum convex polygons (MCP) to compare among different methods. Premilinary results of the study showed variation in monthly ranging patterns of home ranges and core areas that varied markedly in size and shape. Different range estimators produced estimates of range sizes measured over periods of one month or the entire study period. In general CHP hot spot produced the smallest ranges and kernel the largest ones.

B10 **[14 November, 17:00 – 17:20]**

Introducing Project Sounds Kape: Tracking the sound of lar gibbon (*Hylobates lar*) in Kenyir Landscape, Terengganu, Malaysia

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Abstract
The Kenyir landscape is a fascinating area, surrounding a man-made lake, which is an important wildlife habitat and water catchment area. The lar gibbon (*Hylobates lar*), listed as 'Endangered' by the IUCN Red List of Threatened Species, serves an important role in this forest as a keystone seed disperser and is iconic due to its singing behavior. However, its population in Malaysia has plummeted due to habitat fragmentation and illegal trade. Prior to studying the vocal individuality of the lar gibbons as to measure the population of the small apes, we recorded the presence-absence of the lar gibbons by using Passive Acoustic Monitoring (PAM). We deployed and recorded for 24 hours with 30 minutes interval, and we focused on 4am to 12pm sound clips. There were calling bouts in the Bukit Lawit of Kenyir Landscape, however there is no significant difference of absence and presence of the sound of gibbons in the sound samples in between the time intervals $X2$ (5, $N = 60$) = 0.44, $p = .505$. However, with the sound capture, more thorough study is necessary as PAM can be a more feasible tool to study the population of small apes, as it is non invasive and semi autonomous. More information about the small ape's ecological behaviour and distribution can be revealed with continuous deployment of the biocoustic recorders.

B11 **[14 November, 9:00 – 09:20]**

Fourteen years of learning by the Dao Tien Endangered Primate Species Centre: Successful pygmy slow loris (*Nycticebus pygmaeus*) rescue and release in Cat Tien National Park

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Abstract
The illegal trade in pygmy slow loris (*Nycticebus pygmaeus*) in South Vietnam generally involves only small numbers of slow loris per confiscation (<6), and with no teeth pulling. Thus enabling the opportunity for successful rehabilitation and managed release. Using VHF tags over a 14 year period over 80 pygmy slow lorises have been monitored post-release. For the first five years post-release survival rate was low due to variables such as predation, release season and gastro-intestinal parasite load. However, with constant data collection successful pygmy slow loris release protocols have been achieved.

B12 [16 November, 09:20 – 09:40]

Locomotion, postures, and substrate use in captive pygmy slow lorises (*Nycticebus* [*Xanthonycticebus*] *pygmaeus*) - implications for conservation

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Abstract
Studies of positional (locomotor and postural) behavior are central for understanding how animals interact with the challenges imposed by their environment and are crucial for conservation management. The present study investigates, for the first time, the positional behavior and substrate use of the endangered pygmy slow loris *Nycticebus* [*Xanthonycticebus*] *pygmaeus*. Despite their very specialized morphology and ecology, the positional behavior of lorises is understudied. Behavioral data were collected using 1 min scan instant sampling on seven captive animals housed in a large, enriched enclosure of the Poznań Nowe Zoo (Poland), during February to June 2013. Pygmy slow lorises were almost exclusively arboreal and most activities occurred on multiple substrates (82.9%). Small (35.9%) and very large (28.3%) substrates were extensively used. Horizontal (42.1%), and moderately inclined (24.2%) substrates dominated. Clambering (39.4%), quadrupedal walking/running (33.7%), and vertical climbing (17.6%) were the main locomotor modes. Quadrupedal stand was the dominant posture (47.2%), followed by a transitional, semi-suspensory mode (15.9%), hanging (11.4%), and clinging (11.3%). Our results concur with the limited available observations on other species of slow and slender lorises. They further support the diverse and flexible positional repertoire of the species as an adaptation to the exploitation of the continuous lower forest strata with intertwined substrates of various diameters and orientations, where it feeds on fruit, arthropods, and exudates. The protection and management of similar habitats, along with the implementation of measures against hunting and trade, will ultimately contribute to the efficient conservation of the species' populations across its range.

B13 [16 November, 09:40 – 10:00]

Contributions of Denver Zoological Foundation to the conservation of the Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) in Ha Giang Province

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Abstract
The Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) is an endemic primate to Vietnam which has a historical distribution in the northern part of Vietnam. Recent surveys indicated the occurrence of this species is limited to Tuyen Quang and Ha Giang Provinces, with the biggest population inhabiting Khau Ca protection area of Du Gia – Dong Van Plateau National Park. As a sanctuary for the largest population of 'Critically Endangered' Tonkin snub-nosed monkeys, Khau Ca forest is considered the most important protected area for the species. However, the remaining residents of the species are faced with pressure from surrounding local communities. In order to protect the residents of the biggest population of the Tonkin snub-nosed monkey, for the past 12 years Denver Zoological Foundation (DZF) has been leading activities within and surrounding the protected area including patrolling, raising awareness and enhancing the living standard of the local people around the protected area. Through these activities, DZF has contributed significantly to Tonkin snub-nosed monkey conservation at Khau Ca.

B14 [16 November, 10:00 – 10:20]

Deploying arboreal camera traps to monitor primates in Singapore

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Abstract
The Raffles' banded langur (*Presbytis femoralis*) is a 'Critically Endangered' colobine found only in Singapore and Malaysia. It is considered as one of the top 25 most endangered primates in the latest edition of *Primates in Peril* (2022-2023). In Singapore, we carry out field surveys and fecal DNA analyses as part of the langur population monitoring regime. In December 2019, just before the beginning of the COVID-19 pandemic, we deployed a number of arboreal camera traps to examine their feasibility in complementing data collection. During the lockdown when fieldwork was suspended, data from these camera traps contributed toward our monitoring effort. We will share some interesting findings and the literal highs and lows of arboreal camera trapping in Singapore.

B15 [16 November, 11:00 – 11:20]

Evaluating distribution, genetic diversity and species distribution under climate change scenarios

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Abstract
Range wide distribution of grey langur in the South Asia have made taxonomic ambiguity, resulted to time due taxonomic revision, consequently, some of the population have assigned to the new species having restricted distribution. However, recent taxonomic studies evaluated the species status and indicates Himalayan grey langur (*Semnopithecus ajax*) confined to western Himalayas and species name should merged with *Semnopithecus schistaceus* as valid species. We evaluated the taxonomy, distribution and impact of climate change on species distribution of Himalayan grey langur in Himalayan regions using the camera trapping, genetic based analysis and species distribution models. For the genetic based analysis, we sampled the western Himalayan range from the Jammu and Kashmir and Uttarakahd while the species distribution was assessed throughout the Himalayas. Genetic analysis of Himalayan grey langur reveals the presence of single species in Kashmir and Uttarakhand Himalaya with moderate genetic variations and comparative analysis suggest presence of single lineage up to central Nepal. Photographic comparison suggested coat color variation which could be reason for taxonomic ambiguity. SDM predicted the suitable habitat area for species was 24.240 km^2 in the present scenario and east ward shift in distribution range. While under the climate change scenario, it predicted to decline by 64.6% in 2050; 64.1% 2070 (RCP 4.5); and 63.6% in 2050, 20.3% in 2070 (RCP 8.5) and found several protected areas as a climate change refugia for conservation of species. It is recommended that studies be conducted to maintain connectivity across the landscape and that detailed genetic and ecological studies be conducted to understand the evolutionary potential and microclimatic interactions of species for long-term conservation and management.

B16 [16 November, 11:20 – 11:40]

Management approaches to primate conservation in India

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Abstract
India harbors at least 24 species and over 42 taxa of primates including lorises, macaques, langurs and small apes. Either due to some species being threatened, or others in frequent conflict with people, active conservation management practices are required. Many primate species occur in wildlife sanctuaries and national parks. Additionally, wildlife sanctuaries such as Gibbon Sanctuary, Lion-Tailed Macaque Sanctuary and Slender Loris Sanctuary have been established specifically with a primate as an umbrella species. Rhesus macaque (*Macaca mulatta*) has a frequent conflict with people for resources. In order to control the population in conflict zones such as orchards and croplands, over 180,000 macaques have been sterilized. It is estimated that there has been a reduction of about 400,000 rhesus macaques in one state. An experimental large shelter spread over several square kilometers has been established for macaques captured from cities. Another commensal macaque, the bonnet macaque (*Macaca radiata*) of South India, has drastically declined in numbers from several of its habitats. However, these macaques are also being trapped in urban areas and plans are afoot to sterilize them and maintain them in shelters. Suitable regions for conservation of bonnet macaques are being identified. The national plan for primates is now based on identification of three types of zones: Conservation Zones, Coexistence Zones, and Management/Removal Zones. A coordinated breeding program for the 'Endangered' lion-tailed macaque (*Macaca silenus*) may serve as a model for conservation breeding of threatened primate species. With these scientific management plans, there is a realization of long-term primate conservation.

B17 **[16 November, 11:40 – 12:00]**

Estimation of suitable habitat and population density for some threatened primates in Barail Wildlife Sanctuary, Assam, India

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Abstract
The Barail Wildlife Sanctuary is part of the Indo-Burma biodiversity hotspot. Five species of threatened primates are protected in this sanctuary. All these species are experiencing a global decline in population, thus any study to provide information regarding their factors of suitable habitat and population would be worthwhile for their protection. In the current study, population density was determined using distance sampling analysed in DISTANCE software, and suitable habitat analysis was carried out using MaxEnt. Eight biophysical factors were considered while developing models with MaxEnt that were linked to presence points spotted through field surveys. The outcome presented a clear image of suitable habitat and the factors that influence it. For primates like the hoolock gibbon (*Hoolock hoolock*) (46.34% - 16.45%), bengal slow loris (*Nycticebus bengalensis*) (54.47 - 26.08%), capped langur (*Trachypithecus pileatus*) (60.49% - 28.98%), pig-tailed macaque (*Macaca leonina*) (32.86% - 08.53%), and stump-tailed macaque (*Macaca arctoides*) (44.87% - 14.25%), thus, a significant portion of the Barail Wildlife Sanctuary has been designated as 'suitable'. Population density was determined after habitat suitability study. According to the findings, hoolock gibbon (1.70±0.60 individuals/km^2), bengal slow loris (0.79±0.22 individuals/km^2), capped langur (5.17±1.77 individuals/km2), pig-tailed macaques (8.00±3.45 individuals/km^2), and stump-tailed macaques (9.24±3.74 individuals/km^2). This study of the suitable habitat and its factors, as well as population density illustrates and justifies the need for strengthening conservation measures of this sanctuary.

B18 **[16 November, 12:00 – 12:20]**

Status of Primates in Doomdooma Forest Division in the state of Assam, India

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Abstract
The Doomdooma Forest Division is one of the 39 forest divisions in the state of Assam. This division in eastern Assam is contiguous with Arunachal Pradesh as well as well with two neighbouring countries namely Myanmar and China. A study was conducted during 2018-2019 to know the diversity and status of non-human primate in the division. The study also emphasized in identifying the threats towards primates and other wildlife of the Division. Modified line transect method was adopted to study the diversity of primate. During the study period we recorded western hoolock gibbon (*Hoolock hoolock*), capped langur (*Trachypithecus pileatus*) Assamese macaque (*Macaca assamensis*), and rhesus macaque (*Macaca mullata*) through direct sighting. Presence of Bengal slow loris (*Nycticebus bengalensis*) was confirmed on the basis of indirect information. We did not encounter stump-tailed macaque (*Macaca arctoides*) and pig-tailed macaque (*Macaca leonina*) during our study. This study confirmed extirpation of gibbons from 5 forest fragments, capped langur, stump-tailed macaque and pig-tailed macaque from 6 forest fragments in Doomdooma Forest Division in recent past. Habitat loss, habitat shrinkage, fragmentation, canopy loss and encroachment have been identified as major threats. We feel the necessity for further research, awareness and community-based conservation initiatives. This study was supported by US Fish and Wildlife Service, Grant No F18AP00911.

B19 **[16 November, 14:00 – 14:20]**

Assessment of orangutan (*Pongo pygmaeus wurmbii*) habitat and populations within customary forests in West Kalimantan, Indonesia

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Abstract
In Indonesia biodiversity is under threat, largely due to forest clearance for agricultural expansion. Habitat protection is recognized as one of the most important approaches for orangutan conservation, and the designation of Customary Forests is key in reducing forest loss. Biodiversity assessments are essential for effective management of these conservation areas. In 2021, Yayasan Palung assisted the Customary Forest Management Institution in conducting a habitat and biodiversity survey, with particular focus on the Southwest Bornean Orangutan (*Pongo pygmaeus wurmbii*), within six Customary Forests located in two distinct landscapes (Sungai Paduan and Sungai Purang) in West Kalimantan, Indonesia. Results revealed that S. Paduan (67.88 km^2) supports up to 56 orangutans at a density of up to 0.8 ind/km^2, and S. Purang (7.20 km^2) supports up to 5 orangutans at a density of up to 0.7 ind/km^2. Known orangutan food trees comprised an average of 76.2% of trees in S. Paduan and 76.7% in S. Purang. Aside from orangutans, observers recorded 80 bird species and 10 mammal species (including 3 primate species – *Pongo pygmaeus wurmbii*, *Hylobates albibarbis*, and *Presbytis rubicunda*) in S. Paduan, and 50 bird species and 5 mammal species (including 2 primate species - *Pongo pygmaeus wurmbii*, *Hylobates albibarbis*) in S. Purang. Overall, results suggest that these Village Forest areas are suitable habitat for orangutans, but also highlight continuing pressure from anthropogenic activity, particularly hunting, logging, and wildfire. Increased patrolling (and enforcement), public outreach, and fire prevention is required in these areas to reduce these key threats.

B20 **[16 November, 14:20 – 14:40]**

The importance of sengkuang trees (*Dracontomelon dao*) in the small forest fragmented for the Bornean orangutans (*Pongo pygmaeus morio*) conservation

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Abstract
Currently Bornean orangutans (*Pongo pygmaeus morio*) live in the multi-functional landscapes. Within these landscapes sometimes live in small fragmented forests or secondary forest. This study aims to determine the behavior of orangutans in utilizing the Sengkuang trees (Argus pheasant-trees) and the relationship between the presence of orangutans and other primates. Based on the results of this study, showed that orangutans can return to the same tree and even nest, so they are sometimes found together with the long-tailed macaques (*Macaca fascicularis*). This means, between these two primates can utilize resources simultaneously. In contrast to the long-tailed macaques, the pig-tailed macaques (*Macaca nemestrina*) would no to climb onto the Sengkuang tree when the orangutans are up there. In the results of observations carried out for 10 days orangutan on the Sengkuang tree that are bearing ripe fruit, has been observed for 5 individual orangutans, this study showed that the percentage of orangutan behavior in the morning is 45.59% eating, moving 35.7%, rest 16.5%, and the others 2.21%. While the behavior of orangutans in the afternoon comprises 40.27% eating, moving 28.14%, resting 25.98%, and 5.6% other behaviors. Based on the results of this study, it is shown that the presence of Sengkuang trees in small fragmented forest, especially in East Borneo is very important in supporting the existence of food sources for orangutans. Thus, it can be recommended that the Sengkuang tree be important to be conserved and planted in small fragmented forest as orangutan habitats.

B21 **[16 November, 14:40 – 15:00]**

Soil-transmitted helminths in wild Bornean orangutans (*Pongo pygmaeus wurmbii*)

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Abstract
Bornean orangutans (*Pongo pygmaeus wurmbii*), although primarily arboreal, are also active on the ground. Thus, they are at potential risk of infection from soil-transmitted helminths. Soil-transmitted helminths are nematodes that need soil to reach the infective phase. This study was conducted to determine the prevalence of soil-transmitted helminths in orangutan fecal samples and to test whether orangutan height in the canopy is correlated with the abundance of soil-transmitted helminths found in feces. The study was conducted at the Cabang Panti Research Station, Gunung Palung National Park, West Kalimantan, Indonesia. Direct smear method and the single centrifugation flotation method were used to examine 75 fecal samples from 18 orangutans observed during the study period. Samples were collected from adult males (N=15), adult females (N=58) and juveniles (N=2). The results showed that the prevalence of soil-transmitted helminths was 81.3% (61/75). The Pearson correlation test showed that the number of soil-transmitted helminths was significantly correlated with minimum height ($p<0.001$), maximum height ($p=0.035$) and mean height ($p=0.004$) in the canopy. Pearson correlation coefficients ranged between ($r=0.200$-0.399) for all variables with a negative effect. The correlation coefficient for minimum height was $r=-0.390$, maximum height $r=-0.244$ and mean height $r=-0.327$. We conclude that orangutans who engage in activities closer to the ground are at increased risk of infection from soil-transmitted helminths. This may present an increased health risk for orangutans in degraded forests who are more likely to travel on the ground. Future studies will examine the relationship between ground travel and soil-transmitted helminth infection.

ROOM C

C1 [14 November, 11:00 – 11:20]

What we have learned after eight years of environmental education in Balikpapan Bay

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Abstract
We have been running since 2006 a proboscis monkey (*Nasalis larvatus*) conservation program in Balikpapan Bay, East Kalimantan, Indonesia. In 2014, after we realized that it is increasingly difficult to recruit new highly motivated and skilled local people into the program, we initiated the environmental education program in local schools. Our hope was to motivate and train the students to become future conservation leaders. We started with presenting the topic of proboscis monkey conservation in all secondary schools around Balikpapan Bay. After three years, we evaluated this extensive effort as inefficient. The new approach was a more intensive and long-term program in fewer selected schools in primary and secondary level. The teachers met with the students every month and we broadened the scope of curriculum form proboscis monkey conservation to a range of environmental topics. This approach proved to be better but even after another three years we failed to recruit any students who would follow a conservation career after finishing the secondary school. Due to the Covid-19 pandemic the schools in Indonesia were closed for almost two years. After re-opening schools, we started the current, redesigned environmental education program, which is based on the following principles: The program starts at the maternity school level, and the curriculum spans 14 years. The focus is on training and supervising teachers. It does not focus on any specific topic; instead, it places environmental education in a broad context that includes science, social awareness, technical skills, arts and sports. The main focus is on play, on training general skills and on understanding general concepts, not on teaching detailed facts. The curriculum is reviewed on the monthly basis based on reports from the teachers. After three years of teaching, this approach proved to be more efficient than the previous approaches. The most immediate impact is the increase in the professional skills of teachers after several months of supervised teaching. The program spread from Balikpapan Bay and grown into an international network, which was named 'Education4Conservation'. The curriculum is now taught on several Indonesian islands and in three more countries in Africa. We are still looking for more teams to join the program.

C2 **[14 November, 11:20 – 11:40]**

Developing the capacity of young researchers in primate conservation in Vietnam

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Abstract
Frankfurt Zoological Society (FZS) in collaboration with Danang University, currently conducts 15 annual 'Vietnam Primate Conservation Training Courses' for 324 students. FZS also awarded 19 small research grants to students to do the research on primates in Vietnam. We conducted an online survey to examine the impact of the 'Vietnam Primates Training Course' on the career orientation and science research capacity of students who took our course from 2006 to 2021. The survey link was available in September 2021. We received 95 responses from the 100 persons we contacted. The training course is critical for students' conservation career orientation. Until 2021, 11% of trained students were assisted in getting jobs in nature conservation. Almost all (95%) respondents said their knowledge, attitudes and awareness of primate conservation had improved. 74% of graduates said they used the skills and knowledge they learned at the training course in their job and study. 83.2% of participants reported being more involved in local nature conservation activities, projects, and primate conservation research. 49.5% respondents claimed that they have more ideas for their university thesis on primate research. As a result, there are 32 graduate theses and 12 scientific papers on primates in Vietnam have been published. They also established 3 environmental groups and 1 local non-government organization (NGO) dedicated to nature conservation. The cooperation in scientific research and training activities between FZS and Danang University has brought a high level of efficiency in human resources training for nature conservation especially in primate conservation in Vietnam.

C3 **[14 November, 11:40 – 12:00]**

The Kartini Effect: The role of women in primate conservation science in Indonesia

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Abstract
Media coverage of the famous female primatologists, the "Trimates" (Jane Goodall, Dian Fossey, and Biruté Galdikas) is believed to have inspired many women to dive into conservation and primatology. In reality, women's role in primate research is not as prevalent as media may lead us to believe. In Indonesia, despite possessing high primate diversities and growing women's rights movement inspired by Raden Ajeng Kartini (1879 – 1904), a well-known activist who promotes the emancipation of Indonesian women in education and other justice issues, little is known about the status of women in primate research and conservation. Here, we examined how Indonesian women scientists contribute to primate studies by analyzing 86 studies from Web of Science Core Collection on Indonesian primates published 1986 to 2021. We discovered that women's role as first and corresponding author is low compared to men. Mostly, female first authors are associated with female corresponding authors and the same association is found in male. There are primate species for which publications are absent in our literature sample and yet, massive gap in the number of publications on long-tailed macaques (*Macaca fascicularis*) and Oranguntans (*Pongo pygmaeus*) written both by male and female authors. While we identified no species publications written only by women, publications on 14 primate species written only by men. Women as first or corresponding authors were found in all research topics, especially on 'education & awareness raising', and 'phylogeny & genetics'. We observed lower publications by female in 'conservation', 'population density & distribution', 'health & disease', and 'ecology & behavior'. It's beyond the scope of this study to identify why such discrepancies occur; however, we emphasize the gap that exists between male and female Indonesian researchers both in authorship and species studied.

C4 [14 November, 14:00 – 14:20]

Monitoring threatened primate communities using thermal imaging with unmanned aerial vehicle in Cat Tien National Park, Vietnam

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Abstract
Non-human primate species are particularly vulnerable to forest loss, habitat degradation, hunting, and risk of infectious disease transmission. Methods of monitoring threatened species with minimal resources, manpower, and reduced human-primate interfaces, are becoming outstanding requirements. Thermal infrared (IR) imaging with Unmanned Aerial Vehicle (UAV) is a recently emerging and promising tool to monitor primate species. However, systematic validations are still needed to conceive the diverse applications of this method. Our project takes place in Cat Tien National Park located in southern Vietnam, home to the 'Critically Endangered' black-shanked douc langur (*Pygathrix nigripes*), the 'Endangered' southern yellow-cheeked gibbon (*Nomascus gabriellae*), Annamese silvered langur (*Trachypithecus margarita*) and long-tailed macaque (*Macaca fascicularis*), and the 'Vulnerable' stump-tailed macaque (*Macaca arctoides*) and northern pig-tailed macaque (*Macaca leonina*). By combining diurnal ground transect surveys and thermal imaging UAV surveys at night; we aim to identify the potential of thermal imaging UAV for primate species census and to test reliable methodology to monitor diurnal primate communities over 100 km². We performed non-systematic thermal drone survey flights over detected sleeping sites and were able to detect and count populations of douc langur, silvered langur, yellow-cheeked gibbon, pig-tailed macaque, and long-tailed macaque with minimal disturbance. This pilot study showed that IR imagery allowed to detect primate species under canopy cover (including body shape for species identification) and to obtain more accurate counts for each group compared to ground surveys. Our results suggest that thermal imaging with drones could be useful for long-term monitoring of primate communities, and we propose a systematic methodology for estimating primate population abundance and distribution.

C5 **[14 November, 14:20 – 14:40]**

Testing and adopting drones (Unoccupied Aerial Vehicles – UAV) for surveying Delacour's langurs (*Trachypithecyus delacouri*) in difficult-to-access habitats

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Abstract
The 'Critically Endangered' Delacour's langur (*Trachypithecyus delacouri*) is presently restricted to limestone forests in northern Vietnam. The extreme terrain consisting of narrow ridgetops, inaccessible cliffs and valleys, makes it almost impossible to carry out standard population survey methods such as line transects or point counts along foot trails. As in the past those methods applied in the area have proven to be enormously labour-intensive, it is important to explore and adopt a more effective survey method for surveying Delacour's langur in difficult-to-access karst habitats. Using Unoccupied Aerial Vehicles (UAVs) for surveying arboreal primates has been implemented and proved effective in terms of survey results and cost efficiency. Here we tested and adopted a drone Mavic 2 Enterprise Advanced (M2EA) equipped with an optical and a thermal camera for surveying Delacour's langurs in Van Long Nature Reserve, Ninh Binh Province and Kim Bang Forest, Ha Nam Province. We assessed the suitability of this method in detecting, identifying and counting Delacour's langurs; we compared the UAV survey and a ground-based survey in terms of efforts and findings. Besides, we also tested point count/circular plot, transect and valley-based sample/flights in order to identify the most appropriate sampling/flying method for survey of Delacour's langurs in the karst areas. We found that with M2EA it is able to detect, identify and count Delacour's langur, that this method is effective and efficient in comparison to the ground-based survey method, and that valley-based flight/sampling is most appropriate in the area of high terrain variation.

C6 [14 November, 14:40 – 15:00]

Using unmanned aerial vehicle (drone) with mounted thermal camera to detect and count arboreal primates: A case study of Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) in Khau Ca forest, Vietnam

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Abstract
Unmanned aerial vehicles (UAV) or drones equipped with thermal cameras have shown great ability to detect and count number of individuals in wildlife surveys. We used a commercial drone (DJI Mavic 2 Enterprise Advance) to test how the UAV-mounted thermal cameras to assist in population surveys of Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) in Khau Ca forest, Vietnam. As the results, the drone may enable rapid surveys over large areas; the images and/or video footages obtained by thermal cameras are great help to detect and count number of individuals of the monkeys in dense canopies. Low resolution of the thermal sensors (640 × 512 pixels) requires low altitude flight in order to maximize detectability and pixel coverage. Low flight elevation requires more consideration of the risk of collision with trees. Ultimately, the approach requires well-trained persons having operating skills of the drones, and not be easy for covering areas of highly variable terrain.

C7 **[14 November, 15:00 – 15:20]**

Unmanned aerial vehicle (UAV) assisted in counting group size and enabled more accurate population surveys of the 'Critically Endangered' cao vit gibbon (*Nomascus nasutus*)

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Abstract
Gibbons are often difficult to observe in dense forest habitats using traditional ground-based methods. This makes it challenging to estimate group sizes and, in turn, population sizes. This has proven to be a key constraint on accurate monitoring of the last remaining population of the 'Critically Endangered' cao vit gibbon (*Nomascus nasutus*). However, new technologies are beginning to circumvent the problems associated with traditional methods. We hypothesised that, by using an Unmanned Aerial Vehicle (UAV), equipped with thermal and standard (RGB) cameras, we could obtain more accurate group size counts than ground-based observations. We tested this during a population survey of the cao vit gibbon, finding strong evidence (93% probability) that UAV-derived counts were indeed higher (by 43%) than concurrent ground-based counts. We recorded six primate groups of three species (cao vit gibbon, rhesus macaque and assamese macaque), including 24 gibbons across four groups (~20% of the global population). The RGB video footages also revealed seven gibbon females, two of which were carrying infants, providing vital group composition data. These data have directly contributed to a more accurate population survey of the species than would have been possible using direct observation only. We anticipate more widespread use of UAV's in the study of gibbons and other threatened species, leading to a more robust evidence-base for their conservation.

C8 [14 November, 16:00 – 16:20]

A Population Viability Analysis of douc langurs (*Pygathrix* spp.) in Vietnam

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Abstract

Douc langurs (*Pygathrix* spp.) range in Vietnam, Cambodia, and PDR Laos, and all three recognized species are currently listed as 'Critically Endangered' by the IUCN Red List, due to habitat loss, fragmentation, and increased levels of poaching created by the demand for their use in traditional medicines. Sub-populations in Vietnam rarely exceed 1000 individuals and despite reducing populations, there is a dearth of research on extinction risk analysis to understand how these threats directly affect their survival. We ran a population viability analysis (PVA) using VORTEX and modelled scenarios of increasing rates of deforestation and poaching to reflect the two biggest threats to red-shanked douc langur (*Pygathrix nemaeus*), black-shanked douc langur (*P. nigripes*) and grey-shanked douc langur (*P. cinerea*), within nine different sites in Vietnam. Our findings suggest that populations modelled were predicted to decline by at least 62% within the next 50 years. Loss of habitat and poaching have different effects on douc populations depending on the habitat size and the starting population, and isolated populations of fewer than 100 individuals would not be able to maintain healthy levels of genetic diversity. The PVA we ran also highlights some gaps in knowledge of the life history and reproductive behaviours of wild douc langurs, population numbers in non-protected areas, and the details of the illegal trade. Further research is required to produce more accurate population viability analyses and to understand the drivers and enabling factors behind illegal trade in order to implement more effective protection for douc langurs.

C9 **[14 November, 16:20 – 16:40]**

Monitoring program of the northern white-cheeked Gibbon population (*Nomascus leucogenys*) in Pu Mat National Park, Vietnam

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Abstract
Pu Mat National Park, Vietnam is recognized as home of the largest population of the northern white-cheeked gibbon (*Nomascus leucogenys*) in Vietnam. A community-based monitoring program of this gibbon population has been developed and implemented in the Khe Choang region of Pu Mat National Park. In total, 30 2-km grid cells have been surveyed and monitored by 940 man-days from August 2021 to September 2022. In 442 listening hours of gibbon songs during 145 field days, there were records of 122-130 individuals of 57-60 gibbon groups. This result confirms that the Khe Choang region of Pu Mat National Park is home of one of the largest populations of *Nomascus leucogenys* in Vietnam.

C10 [14 November, 16:40 – 17:00]

Assessment of climate change impacts on two endangered primates in Vietnam: Francois' langur (*Trachypithecus francoisi*) and cao vit gibbon (*Nomascus nasutus*)

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Abstract
The Francois' langur (*Trachypithecus francoisi*) and the cao vit gibbon (eastern black gibbon, *Nomascus nasutus*) are two highly threatened primates that live in fragmented habitats in both Vietnam and China. While the current main threats to those primates include illegal hunting and habitat destruction, the potential effects of global climate change on their well-beings are still poorly known. In this study, we used Maxent, a species distribution modelling approach, to predict the risk of potential species distribution changes in response to future climate change and inform conservation planning for the Francois' langur and the cao vit gibbon. We constructed an optimally tuned model to predict climatically suitable habitat for both species in current conditions, then projected the models to two future periods, 2041–2060, and 2061–2080, using data from two general circulation models. Our models showed high predictive performance and successfully predicted the current known range of the primates. The analyses estimated an overall loss in total suitable habitat for both species, compared to the current predicted ranges, and they also helped reveal important areas for future conservation efforts. It is recommended that the predicted climatically suitable areas that are close to the current known range be worth targeting for future habitat restoration and population re-establishment and recovery efforts, while balancing other threats and management concerns. This study shows that distribution modeling using Maxent is a valuable tool to better understand the impacts of climate change on primate species of Vietnam, and to foster collaboration for transboundary conservation issues.

C11 [14 November, 17:00 – 17:20]

Population status, diet and conservation of Hatinh langurs (*Trachypithecus hatinhensis*) in 'Tuyen Hoa Special-use Forest', Quang Binh Province

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Abstract
'Tuyen Hoa Special-use Forest' is located in Tuyen Hoa District, Quang Binh Province. It is home to the 'Endangered' Hatinh langur (*Trachypithecus hatinhensis*). To date, very little information is available on the status, ecology and behavior of the species. The focus of the present study was to determine the size of the total population, group size, diet, threats and other conservation relevant information. Line transects and vantage point methods were used to determine the number of groups and group size. Food and food parts eaten by the langurs were observed directly in the field. As a result, a total of 22 groups and 156 individuals of Haitinh langur were recorded. Group size ranged from 2 to 13 individuals, with an average of 7.09 individuals (SD=±3.03). These groups live in fragmented forests in three main areas: Dong Hoa Commune (57 individuals), Thach Hoa Commune (91 individuals) and Thuan Hoa Commune (8 individuals). Hatinh langurs fed on the leaves and fruits of 15 different species. The population is threatened by fragmentation, conflicts with local people and also by close contact with local people. Measures to conserve the populations and the habitat are taken immediately. In the long term, it is necessary to establish corridors connecting the fragmented forests to ensure the long-term survival of the population.

C12 [16 November, 09:00 – 09:20]

Southwest China, the last refuge of continental primates in East Asia

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Abstract
Knowledge of primate evolutionary history from the Late Miocene to the present in East Asia is necessary to develop a conservation strategy for primates today and future. This background is especially evident from the distributions of fossil-bearing sites in the Pleistocene and historical records over the past 800 years. We illustrate catarrhines' early dispersal and radiation routes, paths, and later shrinking trajectories, providing robust evidence and information for making or amending conservation strategies. Catarrhines (apes and Old-World monkeys) in East Asia are analyzed in this study. The results indicate that their spread during the Pleistocene from the west to east remarkably involved the three river systems (Yangtze, Yellow, and Pearl) and the coastlines, resulting in broad distributions in the Far East (Taiwan, Korea, and Japan). Unfortunately, their continental taxa significantly suffered reductions from ancient to modern Holocene, leading to a tremendous biodiversity loss in East Asia. These events corresponded to major periodic social upheavals and anthropogenic activities, particularly in the first half of the last century and the post-war period after 1950 that has involved unparalleled environmental devastation and natural resource depletion. Except for the taxa in Taiwan and Japan, primates in East Asia will finally be confined to Southwest China, especially a Convergence-Divergence Center (CDC) that has played a unique role in shielding primates and other animals, as well as the plants since the Later Miocene. Thus, developing a specific conservation priority is critical for the CDC and its adjacent regions to mitigate primate extinction in East Asia.

C13 [16 November, 09:20 – 09:40]

The making of a natural kind: An ethnoprimatological research of the Yunnan snub-nosed monkeys (*Rhinopithecus bieti*) in a century

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Abstract
Zoologists have tended to understand animals from the perspective of natural sciences. By contrast, before the rise of multi-species ethnography in the 2010s, anthropologists have regarded animals as a material and/or conceptual resource that can be organized and reorganized by humans. In my project, I re-examine these two approaches by conducting fieldwork in Yunnan, China from 2018 to 2021, focusing on the impacts of primate tourism upon Yunnan snub-nosed monkeys (*Rhinopithecus bieti*) (their population, reproduction, behaviors), on the one hand, and upon the life of local residents, on the other. These ethnographic data offer insight into the agency of monkeys and how monkeys and humans have been intertwined. I find that the monkeys have been constructed and shaped by specific social, cultural, political, and historical forces in China over the twentieth century. Our understanding of species, as well as human-animal relationships, is in need of revision.

C14 [16 November, 09:40 – 10:00]

Impact of forest fire on orangutan feed fruit plants availability at the Tuanan Orangutan Research Station, Central Kalimantan

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Abstract
The Tuanan Orangutan Research Center (TORS) is situated in a degraded peat swamp forest that was previously a timber concession. The area has been burned numerous times, with the worst occurring in 2015. This condition affects the forest ecosystem, such as the availability of fruit for orangutans (*Pongo pygmaeus wurmbii*). This study aims to determine the availability of fruiting plants of trees and lianas as orangutans feed before and after the fire. The fruit trail method was used to observe the availability of fruiting plants (trees and lianas) at the TORS from 2012 to 2016. A total of 63 species of trees and 15 types of lianas were recorded as orangutan feed. Fires in TORS and surrounding areas occurred from September to October 2015. Before the fires, the fruit season was at its peak between November and January. Liana abundance returned to high in April-June, while tree fruit abundance remained low. This condition reduces the diversity and abundance of fruiting plants, resulting in no peak fruit season. Only 8 liana and 37 tree species were recorded after the fire. The monthly average abundance fell from 30 trees/km to 11 trees/km. *Leucophalos callicarpus* (liana), is the important food plant species with the highest fruit abundance and its monthly abundance fell to 22%. Yet, it recovered well during the second peak fruiting season in April-June. Although this species abundance remained stable, it was still lower than before the fire. The presence of orangutans in TORS is affected by the availability of fruit feed.

C15 [16 November, 10:00 – 10:20]

Insect feeding behavior of Sumatran orangutan (*Pongo abelii*) at Ketambe Research Station, Gunung Leuser National Park, Indonesia

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Abstract
Sumatran orangutan (*Pongo abelii*) diet behavior is commonly known to consume fruits and other plant parts, while eating insects is poorly understood. Insect nutrition plays an important role to provide high-quality fallback food sources for orangutans, especially for the Sumatran orangutan in Ketambe Research Station, Gunung Leuser National Park. This research aim is to determine, and analyze the diet behavior of Sumatran orangutans on insects and identify species of food insects. The research was conducted from July to September 2019 using focal animal sampling and instantaneous sampling of four female individuals of Sumatran orangutans (Chris, Cani, Elisa, and Mrs. X). A simple linear regression test was performed to determine the effect of the number of days following the orangutan on the number of orangutan insect feeding techniques used. Adult female orangutans consume 3.33±1.26% of 6 insect species. Individual Cani eats more insects than other female orangutans. Orangutan feeding techniques in obtaining insects were 9 types of feeding techniques, namely BTP (29.23%), BF (13.5%), HSRM (13.5%), RSINS (10.77%), BDK (9, 23%), CLP (9.23%), MTD (6.15%), RS (6.15%) and TAP (1.54%). The Regression test results indicated that the number of days following the orangutan did not affect the number of techniques of the orangutan eating insects. The food insects consumed by adult female Sumatran orangutans contained 8 species of ants (Formicidae), 3 species of termites (Termitidae), and one Ficus‘s pollinating insect (Agaonidae). The use of orangutan feeding techniques in obtaining insects depends on the type of insects obtained.

C16 [16 November, 11:00 – 11:20]

The Sela macaque (*Macaca selai*): a distinct phylogenetic species that evolved from the Arunachal macaque following allopatric speciation

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Abstract
Arunachal macaque (*Macaca munzala*) is an endangered and recently iscovered cercopithecine primate from mid-to-high elevation forests of western part of Arunachal Pradesh state of India. Non-invasive genetic study was conducted to understand their population genetic attributes. The study involves identification of species and individuals, estimation of genetic variation and gene flow, population structure, phylogenetic tree and network using mitochondrial d-loop sequences and ten nuclear microsatellite loci. This study identified 13 new haplotypes which are clustered to form two major groups with substantial genetic divergence between them. Through microsatellite genotyping, 38 unique individuals were identified from 65 non-invasively collected fecal samples. The individual genotypes fall in to two major clusters in Bayesian clustering analyses that corroborate with the outcome of mitochondrial haplotype network analysis. Fossil-calibrated phylogenetic tree suggests that those two groups diverged approximately 2 mya, the time when two well-recognized macaque species, Tibetan macaque (*M. thibetana*) and Assamese macaque (*M. assamensis*) diverged. Landscape genetic approach indicated presence of a geographical barrier, the Sela pass which is a continuous stretch of mountain peaks. The results suggested existence of a new species that evolved from Arunachal macaque and named as the Sela macaque (*M. selai*) which exhibited high intra-specific genetic variation and also harbors at least two conservation units. The present study also identifies gap areas for undertaking surveys to document the relic and unknown trans-boundary populations of macaques through multinational, multi-lateral cross border collaboration.

C17 [16 November, 11:20 – 11:40]

Using bioacustics to monitor gibbons

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Abstract
Monitoring wildlife population trends is critical for the conservation of endangered species and measuring the efficacy of management activities. Recently, passive acoustic monitoring has emerged as a useful wildlife monitoring tool and automatic recorders have been used to detect the presence of gibbons in protected areas of Vietnam. However, these recording devices can be expensive, cumbersome, and difficult to operate in some areas with gibbons. Therefore, inexpensive, lightweight, and easily operated recording devices are needed for wildlife monitoring. In this study, we employed mobile smartphones to detect the presence and distribution, and to estimate the occurrence probability, of the northern yellow-cheeked gibbon (*Nomascus annamensis*) in Dakrong Nature Reserve (405.3 km^2), Vietnam. We surveyed gibbons from February to July 2019, during the dry season, at 95 sites that were systematically spaced throughout the nature reserve. We used the software package, RAVEN, to analyze the sound data and to identify gibbon calls. We detected gibbon calls at 39 out of 95 recording sites. With these data and an occupancy model, we estimated, and examined the effects of environmental factors, on the occurrence probability. Assuming a 600 m detection distance, the model-averaged occurrence probability for the nature reserve was 0.44 (SE=0.06). The area of rich (>100 m^3/ha) and medium (>200 m^3/ha) evergreen forest within 1 km of the recording posts was the most important predictor of, and positively correlated with, occurrence with less occurrence in poor, regrowth forest, plantations, or on bare land. Bioacoustic methods can be potentially used in large-scale gibbon surveys, and the technology is especially attractive given the low cost. Additional work on estimating detection distances and identifying individual gibbon groups using bioacoustics will be useful next steps.

C18 [16 November, 11:40 – 12:00]

The effectiveness of using SMART program in forest patrolling and monitoring of the grey-shanked douc langur (*Pygathrix cinerea*) in Kon Ka Kinh National Park, Gia Lai Province, Viet Nam

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Abstract
From January 2019 to December 2021, SMART program was applied to 9 forest ranger stations of the Kon Ka Kinh National Park for forest patrolling. Smart Mobile apps version 6.3 was used by park rangers to collect forest patrol data. As a result, 1,216 patrols were conducted, with 1,310 days spent in the field, 7,998 km of forest paths were patrolled, and 382 park rangers participated in patrol trips. 534 human impact events were recorded and handled, 1.768 wire traps were collected and removed, 34 firearms were confiscated. A detailed map that demonstrated the forest paths, locations of impact (traps and illegal activities) was achieved. From May to June 2020, field surveys on the density and distribution of the grey-shanked douc langur (*Pygathrix cinerea*) were conducted independently by an expert team. 24 line-transects (average 3.8 km in length) were set up at elevation from 950 m to 1400 m. Each transect was repeated three times in three consecutive days. The population density of langur species was analyzed using Distance software version 7.3. Research results showed that the density of the grey-shanked douc langurs is 1.18 group/km^2. It is estimated that there are about 248.3 (± 107.3) groups with 1,557 (± 696.2) individuals in Kon Ka Kinh National Park. The main distribution areas of the douc are in forest compartments 433, 414, 105, 104, 95, 91, 79, 78, 71. Based on the forest patrol data, the forest compartments were well patrolled in terms of frequency and number of park rangers participated. This result suggests that using SMART program for forest patrols has a positive influence on population recovery and distribution of the grey-shanked douc langur.

C19 **[16 November, 12:00 – 12:20]**

Status and Community-based conservation of the Delacour's langur (*Trachypithecus delacouri*) in Kim Bang Forest and Lac Thuy-Huong Son Area, Vietnam

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Abstract
The Delacour's langur (*Trachypithecus delacouri*) is 'Critically Endangered' and endemic to Vietnam. Conservation attention was mainly paid to the biggest Van Long population while other scattered, small, considered "unviable" populations were neglected and poorly known. Timely status assessment and appropriate conservation actions are necessary to prevent their extinction. We, Center for Natural Conservation and Development (CCD), conducted field surveys in Kim Bang Forest in 2018. We found the second largest population with a total of 73-100 individuals. The findings have, well in time, informed the protection area establishment in Kim Bang District. Furthermore, since 2019, we have been establishing a community-based conservation team, who closely corporates with CCD's technical officer to implement the monitoring and patrolling in Kim Bang Forest. In addition, our surveys in Lac Thuy-Huong Son Area (2021) confirmed three Delacour's langurs and provisionally recorded other eight individuals via local interviews. The findings have been reported to local stakeholders in order to mobilize human and financial resource for Delacour's langur conservation. Thus, Hanoi authorities have issued an official call for Delacour's langur conservation. Our work increased understanding of Delacour's langur status in Kim Bang and Lac Thuy - Huong Son Area and informed species conservation, especially in the context that there is a tendency and initial effort to establish a langur conservation complex including Van Long Nature Reserve, Dong Tam Forest, Kim Bang Forest and Lac Thuy-Huong Son Forest, which is probably ideal for sustainable development of the Delacour's langur.

POSTER SESSION (BUILDING G6)

Intra-group competitions and social dynamics regarding the dispersal and development of offspring in wild Javan gibbon (*Hylobates moloch*)

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Abstract
Natal dispersal is an important life-history trait in all animal taxa. In pair-living species, parent-offspring competitions derived from offspring's maturity and competency can motivate the natal dispersal of offspring. However, not much has been known about the dispersal mechanisms of pair-living gibbons. To test intra-group feeding and mating competition as potential reasons for dispersal, we investigated the effect of the offspring age and sex on relationships between parents and offspring in wild Javan gibbon (*Hylobates moloch*) in Gunung Halimun-Salak National Park, Indonesia. We collected behavioral data for two years from November 2016 to August 2017 and from January 2019 to November 2019, which included juvenile to subadult stages of offspring. We found that aggression from adults toward their offspring increased as the offspring got older in both feeding and non-feeding context. Also, offspring received more aggression from the parent of the same sex. While offspring decreased co-feeding and grooming time with parents as they got older, there was no change in the proximity and the rate of approaching to parents both in feeding and non-feeding context. Our results suggest the presence of both intra-group feeding and mating competition which increase with the offspring's age. We highlight that increased competition between developing offspring and parents changes their social relationships and peripheralizes offspring from the natal group which will eventually motivate subadult offspring to disperse in Javan gibbons.

Serendipitous discovery of white-cheeked macaque (*Macaca leucogenys*) from Arunachal Pradesh, India

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Abstract
Two most recently described macaque species; the white-cheeked macaque (*Macaca leucogenys*) and Arunachal macaque (*Macaca munzala*) were discovered from a single biodiversity hotspot, the Eastern Himalaya. We conducted surveys in the West Siang, Arunachal Pradesh, India and collected five faeces and two skin samples of macaques that on DNA analysis identified as white cheeked macaques. Subsequently, we undertook intensive field surveys and successfully captured white cheeked macaques in camera traps as well as found a captive juvenile individual during questionnaires from the same region. We report white-cheeked macaque from West Siang about 197 km away from China. Unfortunately, white-cheeked macaque has not been yet included in the Wildlife (Protection) Act 1972 of India and therefore, the present study laid foundation to promote field studies in central Arunachal Pradesh to delineate distribution boundary and population size of white-cheeked macaque in Arunachal Pradesh.

First record of the mixed-species association and hybrid offspring between two threatened species: Capped langur x Phayre's langur (*Trachypithecus pileatus* x *T. phayrei*) in Bangladesh

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Abstract
Although most animal groups contain members of their own, sometimes individuals of other species join a group which is known as polyspecific, heterospecific or mixed-species groups. Mixed-species association is a broad term representing from the temporary foraging association to permanent group living. It mostly involves species from related taxa; found in birds, mammals and fish. Mixed-species association can result in hybrid offspring between two different species in the wild. From December 2021 to April 2022, we conducted a 27-day study in three forest patches (five days in Lathitila, seven days in Rema-Kalenga and 15 days in Satchari National Park each forest) in northeast Bangladesh based on the information of eco-tourist guides. In this study, we present the first evidence of mixed-species association between two threatened primate species Phayre's langur (Trachypithecus pileatus) and capped langur (T. phayrei) in those forest patches of north-east Bangladesh. We found three confirmed Mixed-species troops where in two cases adult male T. phayrei permanently immigrate into the group of T. pileatus and in one case adult male T. pileatus permanently immigrates into the group of T. phayrei. We also reported a confirmed hybrid offspring between T. phayrei and T. pileatus. The juvenile male hybrid offspring had combined external body features from the parent species. However, A long-term detailed study is needed to know the reason for mixed-species associations, the behavioural pattern of mixed-species groups and the fate of the presumed hybrid offspring.

Epidemiology of herpes B viruses in long-tailed macaques (*Macaca fascicularis*) and rhesus macaques (*M. mulatta*) in Thailand

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Abstract
Herpes B virus (BV; Cercopithecine herpesvirus 1 or Macacine alphaherpesvirus 1) is a zoonotic disease that can infect to Asian macaques such as long-tailed macaque (*Macaca fascicularis*) and rhesus macaque (*M. mulatta*). Horizontal BV transmission between macaques or between macaques to humans can occur through oral, ocular, or open skin lesions by a fluid contact from an infected macaque. The fatal cases of 70-80% were reported, if no immediate treatment was applied after an infection, and up to 20% were dead even if the drug intervention was applied. In Thailand, long-tailed and rhesus macaques co-exist and highly interact with humans in many locations such as tourist attraction sites and temples, and a transmission of BV from monkeys to humans is a point of concern. However, no data of the prevalence of BV in free-ranging macaques in Thailand are published. Thus, this study conducted a captured-and-released field work for 17 populations (totally 785 animals) of free ranging long-tailed and rhesus macaques throughout Thailand, and collected plasma for anti-BV IgG antibody detection using ELISA technique. Results showed that all 17 populations of macaques were BV positive, ranging 7.1% to 100%, and two populations that all macaques were BV positive. From these studies, it indicates that long-tailed and rhesus macaques that inhabit overlapping with humans harbor high percentage of BV and the interface between humans and macaques can increase the possibility of human exposure to BV infection. Thus, the proper caution when approaching Thai macaques should be taken.

Artificial canopy bridge for conservation: An initiative to mitigate primate road-kill and electrocution

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Abstract
One of the major threats that have resulted in breakdown connectivity in arboreal species is forest fragmentation. Fragmentation results in high mortality of many species while crossing roads between forest patches. Road accident and electrocution is a major threat of primates all over the world. As an initiative to mitigate this problem, we constructed three single-line artificial canopy bridges in Satchari National Park and evaluate the significant of these bridges. The artificial canopy bridges were made of polypropylene ropes and camera traps were used to monitor the animal passing over the bridges. From March 2021 to October 2021, we have evidence of total 1060 animals using our artificial canopy bridges over 157 camera trap days among them eight mammal species, including five primates; two squirrel and one plam civet were encountered. In the midst of six primate species of SNP, Phayre's langur (*Trachypiythecus phayrei*) most frequently used the bridges (n = 164) followed by capped langur (*T. pileatus*) and northern pig-tailed macaque (*Macaca leonina*). The only nocturnal primate of Bangladesh Bengal Slow loris (*Nycticebus bengalensis*) was also seen 67 times to cross the bridges. On the other hand, we found northern pig-tailed macaques and capped langurs to use bridge-2 most frequently whereas bridge-3 was most frequently used by Phayre's langurs and Bengal slow lorises. During our study period we did not find any mortality record of mammals by road accident or electrocution. We strongly suggest building artificial canopy bridges to avoid such.

Preliminary assessment of medicinal plants in the diet of the Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) at Khau Ca Species and Habitat Conservation Area, Ha Giang Province, Vietnam

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Abstract
Results from previous studies showed overlap between the use of medicinal plants for treating similar diseases in primates and humans. The present study was carried out to evaluate the similarity between plant species ingested by Tonkin snub-nosed Monkey (*Rhinopithecus avunculus*) at Khau Ca Species and Habitat Conservation Area, Ha Giang Province in Vietnam, and those used as medicine by local people around Khau Ca area. Of the 32 plant food species recorded in the diet of these monkeys, 14 are recognized medicinal plants. Our assessment was based on a review of previously published literature on the pharmacology and local indigenous knowledge of these plant species. Of these, the plant parts ingested of four species (13% of the total diet) were the same as the plant part used as medicine by humans. While we did not collect health data of our study subjects this time, it is predicted that the monkeys chose these plant parts in response to some homeostatic imbalance. In addition to furthering our understanding of animal self-medication, this preliminary study revealed medicinal plants in the study area of potential value for the treatment of human diseases, and may further contribute to the conservation of both monkey and rare plant species in Khau Ca area. The relationships between plants, monkeys, and humans observed in this study need to be investigated in more detail. This line of research may also be helpful in the search for novel bioactive compounds of use to humans.

Developing expertise in the captive care knowledge for pygmy slow loris (*Nycticebus pygmaeus*) and black-shanked douc langurs (*Pygathrix nigripes*), rescued from the illegal wildlife trade by the Dao Tien Endangered Primate Species Centre, South Vietnam

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Abstract
Without experience of caring for pygmy loris (*Nycticebus pygmaeus*) and black-shanked douc langurs (*Pygathrix nigripes*) langurs in captivity, following rescue from the illegal trade survival rates are low. Since 2008 the Dao Tien Endangered Primate Species Centre, located in Cat Tien National Park, South Vietnam, has been rescuing and rehabilitating native primates for release into the wild. We have worked to attain knowledge for specialist care protocols, specifically unique to the highly seasonal monsoon forest of South Vietnam. These two species - both native to this region - have to survive extreme dry seasons with limited food resource availability. For example, understanding the subtle differences in diet between the black-shanked douc langur in the south and the grey-shanked douc langur (*Pygathrix cinerea*) in the Central Highlands is a key to improving captive care and ultimately contributes to husbandry success.

Spatial distribution of Phayre's Langur (*Trachypithecus phayrei*) in Southeast Bangladesh

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Abstract

Phayre's Langur (*Trachypithecus phayrei*) is an 'Endangered' colobine primate having a limited distribution in eastern Bangladesh, northeast India, and northwestern Myanmar. In Bangladesh, it is a 'Critically Endangered' species and occurs in mixed evergreen forests in the northeast and hill forests in the southeast. But there is a lack of spatial distribution data, especially in the southeast. We surveyed a total of 24 forest patches in southeast Bangladesh between January 2015 and November 2021 to gather the presence/absence data of the langur walking in pre-established forest trails and conducting informal questionnaires among fringe villagers. We encountered 23 groups in 15 forest patches and the group sizes ranges from 2 to 14 individuals. In 7 patches distribution were cleared by questionnaire survey and in 4 patches distribution were unclear. Phayre's Langur was extirpated from four patches due to extensive hunting for meat. Indigenous communities still hunt wildlife in a total of 21 sites. Using the sighting records in MaxEnt, we modeled the potential distribution of the species to find other suitable habitats in Bangladesh. The vegetation cover, annual precipitation, elevation and mean temperature influenced the distribution. It showed about 1400 km^2 of highly suitable and about 6000 km^2 of moderately suitable area for Phayre's langur in Bangladesh. Among them southeast covered about 980 km^2 of highly suitable and about 5700 km^2 of moderately suitable area. Hence, we recommend specific options to manage and protect the langur population in the 15 sites. Besides, we suggest conducting comprehensive surveys in all potential sites to assess the distribution and population status, and threats to initiate appropriate conservation actions for the last remaining Phayre's langur in southeast Bangladesh.

Avoiding tourists: Insights into the foraging and ranging pattern of the 'Vulnerable' capped langur (*Trachypithecus pileatus*) in a mixed-evergreen forest of Bangladesh

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Abstract
Ecotourism is considered a valuable tool for primate conservation in this era of mass deforestation. But uncontrolled tourism increases disturbances to primate habitats, which can significantly impact their behavior. To investigate the impacts of disturbance by seasonal tourists, we studied the 'Vulnerable' capped Langur (*Trachypithecus pileatus*) from October 2021 to April 2022 in the Lawachara National Park (1.250 ha) of northeast Bangladesh. Following the scan sampling method, we collected data on the ranging behavior and feeding habits of a capped langur group comprising five individuals from dawn to dusk on five consecutive days each month. The capped Langur group spent maximum time resting (37.71%), followed by feeding (22.77%), foraging (20.41%), traveling (16.31%), and other activities. Leaves were the main dietary items (66.67%), followed by fruits (24.57%), flowers (2.72%), buds (5.14%), animal matters (0.1%), and others. The average daily path length of the group was 717.31 m. The highest path (1301.5 m) traveled during October and the lowest (552.5 m) in November. Tourists traversed almost half of the studied trails during our observation. On the tourist-rich days, the group foraged in selected areas that were comparatively less disturbed and not preferred by the seasonal tourists. It can be considered a mechanism to avoid the disturbances of seasonal tourists, although long-term data from such disturbed habitats will be useful to explain the patterns clearly. Our findings emphasize controlled ecotourism in threatened primates' habitats to reduce stress and as better management prerequisites.

44 years of primate research in Bangladesh: A review on the research trends, knowledge gaps and a way forward

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Abstract
Evaluation of the research direction of a species group in a country is useful to determine the knowledge gaps and further opportunities. With the aim to set conservation priorities for the primates in Bangladesh, we studied the research trends from 1976 to 2019. We generated a bibliographic database through online searches and categorizing studies into six research themes and classifying species-specific threats following standard lexicons and the IUCN classification scheme. A total of 159 publications were recorded in the 44 years (average 3.61 publications/year) and almost half of these were published in the last decade (2011 to 2019; 8.22 publications/year) which reveals a significant increasing trend. Over half (52.13%) of the studies focused on 'Baseline and Human-primate Interactions' while 'Genetics' (1.22%) and 'Taxonomy' (0.30%) were almost unstudied. We found clear taxonomic and spatial biases. Rhesus macaque (*Macaca mulatta*) was the highest (22.26%) studied species followed by western hoolock gibbon (*Hoolock hoolock*)(18.30%) and capped langur (*Trachypithecus pileatus*)(17.40%) but information on other globally threatened species were found extremely limited. About 66% of the studies were conducted in eastern Bangladesh containing some primate-rich habitats and other parts of the country got poor attention. The population of all primate species in the country has a declining trend due to severe anthropogenic threats and stressors including habitat loss, fragmentation, hunting, vehicle collisions, electrocution, illegal trading, and others. Meanwhile, stump-tailed macaque (*Macaca arctoides*) and long-tailed macaque (*Macaca fascicularis*) are considered extinct in the country. Hence, we suggest urgent conservation action, an adaptation of current management strategies, and government fund to conserve the remaining primates in Bangladesh.

5-years' experience with the breeding of red-shanked douc langurs (Pygathrix nemaeus) in captivity

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POSTER PRESENTATION

Abstract
Douc langur is kept in captivity outside of Asia rarely. Due to the Vietnam war, deforestation, and hunting, their numbers in the wild have been declining as well. The situation in zoos outside is quite different from the ones in captivity in Asia, due to the difference in climate, ambiance, available food, etc. However, any new experience may be helpful for any future breeding attempts. Our experience corresponds to the available from captivity and the wild in the aspect that the langurs doucs (and other Colobine) spend a significant part of the day resting and sleeping. This is probably due to the leaf-based diet requiring relatively long digestion, as well as saving energy due to the food having low number of calories. The leaves make a significant part of the langurs' diet. They get the brier, raspberry, and blackberry all year around. Over the whole year, we import branches of Ficus racemosa. Only in winter, part of the diet is made of frozen leaves (the whole branches are kept frozen). It turned out to be possible to create a diet that is based on local greens that is acceptable both qualitatively and financially. This is important for two reasons. On one hand, the diet allows for problem-free husbandry with regards to their health and effective metabolism during digestion. On the other hand, the regime works ethologically and socially, as feeding is one of the most important factors for behavior and dynamic development of the social structure of the group.

Establishment of ELISA for diagnosis of Echinococcus spp. in primates

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POSTER PRESENTATION

Abstract
Cystic disease caused by Echinococcus orlepii at the Endangered Primate Rescue Center (EPRC), Cuc Phuong National Park is one of the main causes affecting the health and life of primates. The study was conducted to establish an ELISA reaction with diagnostic value in primates, using antigens from cyst fluid. The results identified a sensitivity and specificity of 100% and 91.67%, respectively, with a cut-off value of 0.25. The ELISA method was established to be applied to diagnose cysticercosis to minimize the loss of life for primates.

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