THE SCHOOL FOR FIELD STUDIES

Tracking and Conservation of Big Cats in the Himalayas SFS 3191

Syllabus

The School for Field Studies (SFS)
Ugyen Wangchuck Institute for Conservation and Environmental Research (UWICER) and Bhutan Ecological Society
Centre for Himalayan Environment and Development Studies
Paro, Bhutan

This syllabus may develop or change over time based on local conditions, learning opportunities, and faculty expertise. Course content may vary from semester to semester.

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COURSE CONTENT SUBJECT TO CHANGE

Please note that this is a copy of a recent syllabus. A final syllabus will be provided to students on the first day of academic programming.

SFS programs are different from other travel or study abroad programs. Each iteration of a program is unique and often cannot be implemented exactly as planned for a variety of reasons. There are factors which, although monitored closely, are beyond our control. For example:

- Changes in access to or expiration or change in terms of permits to the highly regulated and sensitive environments in which we work;

- Changes in social/political conditions or tenuous weather situations/natural disasters may require changes to sites or plans, often with little notice;

- Some aspects of programs depend on the current faculty team as well as the goodwill and generosity of individuals, communities, and institutions which lend support.

Please be advised that these or other variables may require changes before or during the program. Part of the SFS experience is adapting to changing conditions and overcoming the obstacles that they may present. In other words, the elephants are not always where we want them to be, so be flexible!

Course Overview

Within the Eastern Himalayas, Bhutan is increasingly seen as the last biodiversity refugia. In particular, Bhutan is home to 10 wild cat species, with the Snow Leopard, Tiger and the Clouded Leopard being the most charismatic big cat species. With 70% of its land under forests, and over 50% conserved under a well networked protected area system, these wild cats and associated species continue to thrive in Bhutan. A deep spiritual and cultural reverence for life and nature has aided in the persistence of biodiversity. However, climate change and human-wildlife conflicts continue to pose serious threats to the long term health of Bhutan's landscapes and species therein. Tracking the status of important keystone species such as Tigers and Snow Leopards, and understanding threats and opportunities will be crucial in helping to adequately mitigate threats and implement effective adaptation strategies to ensure the long term survival of species in the wild.

The summer course on *Tracking and Conservation of Big Cats in the Himalayas* will focus on understanding key issues and challenges associated with conservation of wild cats and associated species. Students will be introduced to the socio-political and cultural significance of Himalayan landscapes and biodiversity, with a special focus on charismatic species such as the Tigers and Snow Leopards. Interactions with stakeholders from the Government, academia, local people and civil society will allow students to understand environmental governance frameworks and better appreciate on-the-ground conservation challenges associated with climate change, human-wildlife conflicts and limited financing and capacity.

The four-week course will be a mix of classroom lectures and field trips to different parts of Bhutan. Traveling through Bhutan, students will learn about conservation challenges, culture and history, religious traditions and environmental issues. Students will stay in Bhutanese villages and trek across Himalayan landscapes to experience and understand rural livelihoods and their connection to the natural environment. Academically, students will develop skills in assessing environmental problems, designing socio-economic surveys, conducting resource assessments, and communicating results. Students will learn camera trapping techniques and associated data analysis skills to estimate population sizes and map species distribution ranges in a GIS. Students will also be introduced to radio-telemetry and estimation of home ranges. Throughout the course, students will be guided to appreciate the complexities and challenges involved in effective conservation of wildlife.

SFS partners with the Ugyen Wangchuck Institute for Conservation and Environment Research (UWICER), an international research and training facility in Bumthang, Bhutan and the Bhutan Ecological Society (BES), a Civil Society Organization promoting environmental sustainability in Bhutan. SFS students and faculty will collaborate with UWICER and BES to advance its research agenda in several priority areas, including conservation, forest management, community resource assessment, and development policy.

Learning Objectives

There are multiple topical themes in this course: conservation of charismatic big cat species such as the Tiger and the Snow Leopard, and the estimation of their population; culture, religion and environmental governance frameworks; conservation challenges and solutions. These will be addressed through classroom lectures and discussions, field lectures, and field research in the form of Field Exercises (FEX). Classroom and field lecture topics will include essential background information, and field exercises will be used to reinforce key concepts and provide students with field-based experiences. Extended field

trips will enable students to examine ecological and cultural elements across the landscape and cultivate a deeper understanding of the social, religious, political and environmental characteristics of Bhutan.

Following this course, students should:

- Understand key issues and challenges associated with conservation of wild cats and associated species
- Develop an appreciation for the role which culture, spirituality, governance and institutions play within conservation
- Be able to conduct socio-economic surveys and stakeholder consultations to identify conservation challenges and opportunities
- Understand and be exposed to camera trapping and radio-telemetry tools for estimating wild animal populations and their distribution and home ranges
- Be able to use socio-economic and camera trapping data to design and develop a conservation project proposal for a designated landscape

Assessment

The evaluation breakdown for the course is as follows:

Assessment Item	Value
A Review on the Conservation Status of Tigers and Snow Leopards in the Himalayas	20
FEX Presentation: Livelihoods & Conservation	20
FEX Presentation: Ascertaining Cat & Associate Species Diversity from Camera Traps	20
FEX Presentation: Estimating Home Range Sizes for Mountain Tigers in Bhutan	20
A Conservation Project Proposal	20
TOTAL	100

Description of Assignments

A Review on the Conservation Status of Tigers and Snow Leopard in the Himalayas
Students will prepare a 3 – 5 page group report on conservation status of tigers and snow leopards in Bhutan and the Himalayas. The report will aim to establish current distribution ranges and population size. The review will then seek to identify key threats to the persistence of these cats and suggest conservation strategies. Each group of student will present their paper in class.

FEX: Livelihoods & Conservation
Student groups will design and implement an interview or questionnaire related to livelihoods and key challenges to conservation (i.e. human-wildlife conflict). Students will develop survey questions in small

groups, administer the survey, apply basic methods to summarize and analyze qualitative (and quantitative) data. Grading will be based on group presentations explaining rationale, methods used, results obtained and what it means for conservation of big cats.

FEX: Ascertaining Cat & Associate Species Diversity & Population Size from Camera Traps
Students will work in groups to design a camera trap study. They will learn to place camera traps, retrieve, sort and analyze data. Students will prepare a presentation explaining their methods and findings.

FEX: Estimating Home Ranges for Mountain Tigers in Bhutan
Students will use existing data from an on-going study in Royal Manas National Park to calculate home range size for tigers. Working in groups, students will prepare a presentation explaining the theory behind radio-telemetry, the findings from the data set and what inference they can make on the biology of tigers from the southern foothills of Bhutan.

A Conservation Project Proposal
Each student will write a 2 – 3 page project proposal to support conservation of tigers in the Paro valley. Students will be given access to camera trap data, government statistics on conservation challenges and land-use maps. The proposal will seek to secure financing to address conservation challenges.

Grading Scheme

A	95.00 – 100.00%	B+	86.00 – 89.99%	C+	76.00 – 79.99%	D	60.00 – 69.99%
A-	90.00 – 94.99%	B	83.00 – 85.99%	C	73.00 – 75.99%	F	0.00 - 59.99%
		B-	80.00 – 82.99%	C-	70.00 – 72.99%		

General Reminders

Plagiarism, using the ideas and material of others without giving due credit, and cheating will not be tolerated. A grade of zero on the assignment will be given for plagiarism or cheating or aiding another person to cheat either actively or passively. Plagiarism cases may be reported to the student's home institution and may be grounds for further academic disciplinary action.

Deadlines for assignments are established to promote equity among students, to allow faculty enough time to review and return comments and grade before other assignments are due; and to avoid clashes with other activities and courses. Therefore, deadlines are firm and extensions will only be considered under extreme circumstances. Unapproved late assignments incur 10% penalty per day and assignments will not be accepted after three days.

Course Content, Lectures

Type - L: lecture and discussion, **GL:** guest lecture, **FL:** field lecture, **FEX:** field exercise, **SLD:** student led discussion; **SGP:** Student graded presentation

Readings in **bold** are required; others are optional supplementary reading.
****Note: Syllabus items and course content are subject to change****,

No	*Type*	*Class title*	*Hrs*	*Reading*
TBD	L,D	Academic Orientation & Expectations Setting	1.5	
TBD	L	Introduction to Bhutanese Language & Culture	3	
TBD	L	GNH, The Middle Path & Development	1.15	
TBD	L,D	Conservation and Buddhist Culture	1.15	Kuyakanon 2014 Pommaret 2004
TBD	L,D	Biogeography of Himalayas	1.15	Singh 1987 (pages 84-87) Pandey 2015
TBD	FL	Elevation, Gradients & Wildlife Habitats	6	
TBD	L,D	Bhutan – The Last Himalayan Refugia for Big Cats	1.15	Tempa et al. 2013
TBD	L,D	The Governance of Bhutan's Forests & Wildlife	1.15	Agrawal et al 2008 Blaikie & Muldavin, 2004
TBD	L,D	People and Forests: Changing Socio-economic & Political Dimensions for Conservation	1.15	Peet & Hartwick 2009 (Ch1) Rinzin, 2009 Wangchuck, 2015
TBD	L	Impact of Human Wildlife Conflict on Rural Livelihoods	1.15	Wangchuk & Siebert 2013
TBD	FEX	Livelihoods & Conservation	3	Plieninger 2015 & Bhattacherjee 2012 (pages 113-129) Gordon, 2007
TBD	SGP	Livelihoods & Conservation	1.15	
TBD	L,D	The Theory and Practice of Estimating Wild Animal Populations (I)	1.15	Royle 2004
TBD	L,D	The Theory and Practice of Estimating Wild Animal Populations (II)	1.15	Royle 2004
TBD	FEX	Camera Trapping (installation)	6	O'Connell, et al (Eds) 2010
TBD	FEX	Camera Trapping (data retrieval and image sorting)	6	O'Connell, et al (Eds) 2010
TBD	FEX	Estimating Density and Animal Population Sizes	4	O'Connell, et al (Eds) 2010
TBD	SGP	Ascertaining Cat & Associate Species Diversity & Population Size from Camera Traps	1.15	

No	Type	Class title	Hrs	Reading
TBD	L	Landscapes, Prey and Carnivore Interactions & The Role of Big Cats in Ecosystems	1.15	
TBD	FL	Field Methods for Big Cat Collaring	3	
TBD	L	Radio-telemetry: Theory & Applications	1.15	
TBD	FEX	Estimating Home Range Sizes and their Interpretation	6	
TBD	SGP	Home Range Sizes for Mountain Tigers in Bhutan	1.15	
TBD	FL	The Future of Tigers in the Wild – Assessing Tigerscapes	1.15	Tempa et al. 2013
TBD	L	Conservation in Action I (Protected Areas & Biological Corridor Management)	1.15	
TBD	L	Conservation in Action II (Field Strategies i.e. SMART patrolling)	1.15	
TBD	L	Financing Conservation	1.15	
TBD	D	Wrap-up: Making Sense of it All	1.15	
		Total	60.35	

Readings

Agrawal, A., Chhatre, A., & Hardin, R. (2008). Changing governance of the world's forests. *Science*, *320*(5882), 1460-1462.

Ardussi, J. 2004. Formation of the state of Bhutan (’Brug Gzhung) in the 17th century and Its Tibetan antecedents. In *The Relationship between Religion and State (chos Srid Zung Brel) in Traditional Tibet*. Lumbini, Lumbini International Research Institute (reprinted in Journal of Bhutan Studies, Vol. 11, 2005).

Bhattacherjee, A. (2012) Social Science Research: Principles, Methods, and Practices. University of South Florida, USA.

Kuyakanon K.R.S. (2014). Contemplations on a Bhutanese Buddhist Environmental Narrative. In S. Kumagai (Ed.), *Bhutanese Buddhism and Its Culture* (pp. 183–205). Kathmandu, Nepal: Vajra Publications.

O'Connell, A. F., Nichols, J. D., & Karanth, K. U. (Eds.). (2010). *Camera traps in animal ecology: methods and analyses*. Springer Science & Business Media.

Plieninger, T., Bieling, C., Fagerholm, N., Byg, A., Hartel, T., Hurley, P., ... & Van Der Horst, D. (2015). The role of cultural ecosystem services in landscape management and planning. *Current Opinion in Environmental Sustainability*, *14*, 28-33.

Pommaret, F. (2004). Yul and yul lha: The territory and its deity in Bhutan. *Bulletin of Tibetology* 40 (1): 39-67.

RGOB (1998). *The Middle Path: National Environment Strategy for Bhutan*. National Environment Commission, Royal Government of Bhutan.

Royle, J. A. (2004). N-mixture models for estimating population size from spatially replicated counts. *Biometrics*, *60*(1), 108-115.

Schroeder, R., & Schroeder, K. (2014). Happy environments: Bhutan, interdependence and the west. *Sustainability*, *6*(6), 3521-3533.

Siebert, S.F. and Belsky, J.M. (2014). Historic livelihoods and land uses as ecological disturbances and their role in enhancing biodiversity: An example from Bhutan. Biological Conservation, 177, pages 82-89.

Singh, J. S., & Singh, S. P. (1987). Forest vegetation of the Himalaya. *The Botanical Review*, *53*(1), 80-192.

Skog, L. A. (2017). Khumbi yullha and the Beyul: Sacred Space and the Cultural Politics of Religion in Khumbu, Nepal. *Annals of the American Association of Geographers*, *107*(2), 546-554.

Uddin, S. N., Taplin, R., & Yu, X. (2007). Energy, environment and development in Bhutan. *Renewable and Sustainable Energy Reviews*, *11*(9), 2083-2103.