



S F S THE SCHOOL
FOR FIELD STUDIES

Elephant ecology and conservation in Kenya

SFS 3252

Syllabus

The School for Field Studies
Center for Wildlife, Water and Climate Resilience (CWWCS), Kenya
Kimana, Kenya

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 flexibility is key.

Course Overview

The African elephant (*Loxodonta africana*) is an important keystone species in Africa and has profound influence on the structure and dynamics of landscapes where it co-exists with other species. It's one of the most charismatic and charming species but its conservation and population status has continued to attract a lot of concern within and beyond Africa. A key worry is that it's conservation is increasingly becoming uncertain across the entire African continent as due illegal poaching, landscape fragmentation and retaliatory attacks by local communities due to prevalence of human-elephant conflicts. At the beginning of the 20th century, there were several millions of elephants roaming across Africa (Douglas-Hamilton 1979), but today, they have declined rapidly, and are estimated to be nearly 450,000 - 700,000 (Stephenson, 2007).

Illegal poaching has been and remains the biggest threat to the survival of elephants, and this threat is rampant throughout the entire continent (Douglas-Hamilton et al. 1992). Habitat loss, associated with anthropogenic effects is the second biggest threat to the future conservation of the species, and in the last century, large swathes of elephant natural habitats have been converted into human dominated landscapes (Esikuri 1998). This not only leads to loss, reduction, and degradation of elephant prime habitats, but curtails their free movement, reduces their home range, blocks their movement corridors and routes but increases conflicts with humans (Spinage 1990). Collectively, this matrix creates a very inhabitable and hostile environment for elephant survival and conservation programs in all its range in Africa.

Since the advent of wildlife-based tourism in Africa, the African elephant has remained one of the species highly sought by tourists as a member of the big five large mammals which include the rhinoceros, cape buffalo, leopard, and the lion (Okello et al. 2005). Consequently, it plays a key role in the tourism industry across the entire continent, and in this regard, most countries have enhanced their protection and conservation efforts all geared towards saving elephants. In the same breath, given that the species doubles as a flagship and keystone species, its successful conservation is viewed by conservationists as a testimony of how humans can effectively protect other biodiversity types, and their commitment to co-exist with wildlife. The elephant is also an umbrella species which depends on securing large tracks of ecologically connected landscapes and ecosystems, and therefore serves the objective of wider biodiversity conservation (Litoroh et al. 2012).

The spatial-temporal distribution of elephants in Africa is influenced by multiple factors. These include intensity and prevalence of poaching and conflicts with humans, availability of suitable habitats and associated resources especially food and water, human population density and land use changes (Spinage, 1990; Croze and Moss, 2011). For instance, food requirements has been found to be a major determinant of wet and dry season habitat occupancy for the Amboseli elephants, and hostile encounters with local Maasai have been documented to force elephants to avoid local Maasai homesteads (Kangwana, 1993). Similarly, prevalence of poaching in 1970s

and 1980s forced elephants to spend more time inside Amboseli National Park for safety reasons (Croze and Moss, 2011), and this phenomenon was observed in most parts of Africa in response to surge in the menace.

Elephants are mega-herbivores, consuming vast quantities of food, and are known as 'wasteful feeders' (Kerley et al., 2008). They are a savanna keystone species (Western, 1989; Laws, 1970), meaning that their presence ecologically benefits other wildlife species and due to its ecological role in an ecosystem (Twine et al., 2008), they are important in nutrient recycling and seed dispersal, and elicit plant defense and growth responses (Kerley et al., 2008). Elephants and fire are regarded as drivers of alternate states in ecosystems (Kerley et al., 2008). It is sometimes difficult to disentangle the relative roles of elephant, fire, drought, disease, and other browsers in tree population patterns because they often affect the vegetation in combination (Kerley et al., 2008).

As bulky feeders, elephants include low-quality plant matter in their diets (Owen-Smith, 1988). However, to maximize their energy intake there should be a trade-off between selection for scarce, high-quality resources and the utilization of lower quality resources that are presumably more abundant (Illius, 2006). For elephants, nutritional constraints are pronounced as the dry season progresses. In theory, elephants are therefore expected to increase the size of their home range during the dry season to include the resources otherwise available during the wet season. Most often, elephants tend to concentrate their foraging activities in areas close to water during the dry season (Osborn and Parker, 2003) and they then conceivably depend on lower quality food (Owen-Smith, 1988). The restriction imposed by the distribution of water, presence of human infrastructure and presence may therefore coincide with selection for areas with higher food resource availability within the landscape, which may consequently determine the location of elephant home ranges (Damschen et al., 2006).

Few wild animals elicit drastic and different human emotions, as elephants do. They capture the imagination and unswerving affection of many people worldwide, but also inspire animosity and fear among those sharing land and resources with these mega-herbivores. Two factors have a large effect on determining the numbers and distribution of elephants in Kenya, and elsewhere in Africa. These are poaching and conversion of land by people. Therefore, there has been a steady decrease in elephant habitats over many decades throughout Africa wherever human populations have increased. Thus, there is a linear, negative relationship between human population size and elephant density. However, coexistence is possible at low human densities, while loss of habitat occurs at a critical threshold level of roughly 15 people per km². Apart from the widespread habitat loss that is facing elephant populations across the African continent, illegal poaching can eliminate populations, even when human land use would otherwise allow coexistence.

Numerous studies across Africa have extensively reported local community's antipathy to elephants beyond that expressed for any other wildlife species. Communities surrounding forest

reserves and conservation areas engage in small-scale subsistence and cash-crop farming. Those farms close to the boundary are vulnerable to elephant crop raids and damage, which is most intense during the food crop-harvesting season, but also occurs to a lesser extent throughout the year. In the process, elephants jeopardize communities' food security and livelihoods and communities' attitudes towards elephants are consequently and consistently negative in all elephant ranges in Africa.

Resolving human-elephant conflicts has become critical to the improvement of the livelihoods of rural communities co-existing with elephants and conservation of elephants. Resolution of direct conflict between humans and elephants in Africa has become a serious local socio-economic and political issue in recent years, and a continental conservation problem. Many studies have therefore shown that elephant causes diverse damage types including crop depredation, property damage and even threat to human life. About eighty percent (80%) of the African elephant's range lies outside formally protected areas, and inadequate management of the conflicts with humans is frequently a pre-cursor to further decline in the numbers and distribution of elephants.

In this course students will learn and examine diverse and critical aspects of African elephants in Africa, Kenya, and in the Amboseli and Maasai-mara landscapes. This learning process will be achieved through classroom interactive learning sessions, experiential field activities, class discussions and lectures by Faculty and various guests. The specific objectives of the course are:-

1. Understand the status of elephants as an endangered species, its role as a keystone and flagship species
2. Examine elephant ecology and social organization, and implications on their conservation
3. Impart basic skills in field techniques such as conducting social surveys on community attitudes towards elephants, human-elephant conflicts and their manifestations, elephant counting methods, aging, sexing and construction of elephant demography
4. Understand causes, patterns, typology and prevalence of human – elephant conflicts in the Amboseli and Maasai-mara Ecosystem and mitigation strategies
5. Examine ecological consequences of insularizing elephants in small spaces and implications on long-term and sustainable conservation of elephants
6. Evaluate key constraints to elephants conservation among resource-poor rural populations of Africa in an increasingly human dominated landscape matrix

Case Study Overview and Background

Title of Case Study

Elephant space and other resource use, movements, conservation issues and population viability in Amboseli Ecosystem, Kenya

Case Study Question

How can changes in land tenure, human demography and land use in the Amboseli Ecosystem be effectively managed to enhance sustainable and long-term conservation of elephants whilst promoting socio-economic welling and co-existence of local communities with elephants?

Background: The Amboseli Ecosystem

The basis for this case study is the Ecosystem Approach, which takes into underpins the need to promote landscape connectivity as a key pillar in sustainable and long-term conservation of the African elephants. Most of the learning will focus on the Amboseli Ecosystem which is situated in the Southeastern sector of Kenya. The ecosystem comprises of expansive Maasai Group Ranches, which are privately owned parcels of land along the Kenya-Tanzania border, protected areas, mainly, Amboseli, N. Park and several private wildlife sanctuaries/conservancies. It also neighbours the Chyulu Hills, Tsavo West and Mt. Kilimanjaro N. Parks, and has a mixed community made up of different ethnic groups; the Maasai, Kikuyu and Kamba among others. Of importance are the Maasai people, whose pastoral lifestyle has remained highly tied to the environmental conditions and dynamics of the landscape. Thus, this landscape unlike most parts of the country is still endowed with diverse and high wildlife abundance including elephants albeit in a rapidly human altered environment.

Like other parts of the country, the Amboseli region is changing rapidly and its increasingly becoming a human dominated landscape characterized by expanding settlements and infrastructure development. Additionally, its experiencing rapid and significant shifts in land tenure and use patterns, and socio-economic changes among the Maasai and migrants, which is increasing human-wildlife competition for scarce resources (e.g., space, water, and pasture). Unfortunately, the resultant human-wildlife conflicts have serious and long-term wildlife, natural resources conservations ramifications as well as socio-economic costs. They are an immediate and present danger to effective and sustainable wildlife conservation, and the historical harmonious co-existence between people and wildlife. The threats facing wildlife conservation are also a big danger to availability and sustainable use of other critical natural resources particularly water, pasture, and woody plants. And recently, Climate change has also become another serious and worrisome environmental challenge, and whose impacts on the environment, wildlife, and natural resources as well as local livelihoods will be devastating.

Water is also a critical resource limiting land use, plant productivity, wildlife movement and spatial distribution in the Amboseli Ecosystem. There is a natural scarcity of water in this region

because it lies in the rain shadow of the Mt. Kilimanjaro. To compound the problem, Mt. Kilimanjaro's icecaps have been documented to be rapidly receding so much that fewer rivers and streams emerge today from underground springs. Since water is a limiting resource in the ecosystem, such areas are under pressure for degradation due to over-exploitation from community home use, wildlife, livestock, and irrigated farming activities. This situation has further been worsened by recent Climatic changes characterized by highly irregular and insufficient rains, frequent dry spells, and droughts. There is an urgent need to understand the socio-economic, political, and environmental drivers and implications of land reform for wildlife conservation and local livelihoods in this rapidly dynamic and changing landscape.

Another notable change in the Amboseli region is increase in human demography including a high influx of non-Maasai ethnic groups such as the Kikuyu and Kamba. To some extent this has increased demand for natural resources, and land for settlements. The later has lured the Maasai to sell their land due to its high lucrative financial returns, further creating an unfavorable environment for wildlife and natural resources conservation. In addition, the state of environmental and natural resources governance in the entire region is very poor, uncoordinated, and existing laws and guidelines are not effectively enforced by government lead agencies. Accordingly, there's rampant environmental degradation, misuse, commercialization, and overexploitation of natural resources with total disregard of the impacts on livelihoods which are largely dependent on natural resources.

During the summer II program, we will visit Amboseli National Park, community conservancies in the former Kimana group ranch, and camping trip to the world famous Maasai Mara. In the Mara, students will learning various aspects of African elephants including cross-border conservation issues between Kenya and Tanzania and compare these with aspects covered in the Amboseli region.

Assessment

Active participation is expected through class discussions, lectures, field exercises, field trips and course readings. The assessment breakdown for the course grade is as follows:

Assessment Item	Value (%)
FEX 1: Elephant numbers, density and demography	20
FEX 2: Impacts of elephants on vegetation	20
FEX 3: Community attitudes towards elephants vis a vis other key large mammals in the Amboseli Ecosystem	20
-Final exam	30
-Participation	10
TOTAL	100%

Elephant numbers, density and demography (20%): This field exercise will introduce students to elephants and other large mammals in a protected area (Kimana Wildlife Sanctuary or Amboseli National Park). This exercise will follow a similar lecture and film on methodologies. The output will be the estimate of absolute elephant numbers in the park, but also the density of elephants and other large mammals in the park and its major habitats (grassland, swamp, woodland/shrubland). It will be important to establish the portion of elephants in the park and each habitat expressed as individuals and as metabolic biotic weight and explain this finding.

Impacts of elephants on vegetation (20%): Students will assess the typology, extent, and severity of woody vegetation damage by elephants in selected vegetation communities in the Kimana area of the Amboseli Ecosystem. Data will be analyzed to determine the most common types of elephant damage and the severity of damage to woody vegetation. Each student will write a 3–4-page report for grading

Community attitudes towards elephants vis a vis other key large mammals in the Amboseli Ecosystem (20%) Students will work in groups to conduct focus group interviews with local Maasai communities in the former Kimana Group Ranch. They will use social survey methods to collect qualitative data and information that describes and explain participant’s attitudes towards elephants compared to other large wildlife species. Students will analyze the data and make a short presentation on their findings and views on key emerging issues. Afterwards students will write individual reflection reports on the exercise

Final exam (30%): During the final exam you will be tested on material presented in lectures, field lectures and excursions. Answering questions will require critical and analytical thinking across the various teaching units.

Grading Scheme

A	>95%	B+	86-89%	C+	76-79%	D+	66-69%
A-	90 – 94%	B	83-85%	C	73-75%	D	60-65%
		B-	80-82%	C-	70-72%	F	<59%

General Reminders

Readings: Assigned readings and hand outs (exercises/assignments) will be available prior to the scheduled activities. Course readings must be read and clarification on issues sought where necessary since ideas and concepts contained in them will be expected to be used and cited appropriately in assigned course essays and research papers.

Plagiarism: Using the ideas or material of others without giving due credit – is cheating and will not be tolerated. A grade of zero will be assigned for anyone caught cheating or aiding another person to cheat either actively or passively (e.g., allowing someone to look at your exam).

Deadlines: Deadlines for written field exercises and other assignments are posted to promote equity among students and to allow faculty ample time to review and return assignments in good time. As such, deadlines are firm, and extensions will only be considered under the most extreme circumstances. Late assignments will incur a 10% penalty for each hour that they are late. This means an assignment that is five minutes late will have 10% removed. an assignment that is one hour and five minutes late will have 20% of the grade deducted.

Participation: Since we offer a program that is likely more intensive than you might be used to at your home institution, missing even one lecture can have a proportionally greater effect on your final grade simply because there is little room to make up for lost time. Participation in all components of the program is mandatory because your actions can significantly affect the experience you and your classmates have while attending the SFS program. Therefore, it is important that you are prompt for all course activities.

Course Lectures and Activities

Type: L = Lecture, FE = Field Exercise, FL = Field Lecture, TL = Travelling Lecture.

Faculty: RK=Richard Kiaka, MO=Moses Okello and JW=John Kiringe

Code	Titles of Lectures & Field Exercises	Readings	Time	Instructor(s)
EE 01	Case study overview: conservation issues in the Amboseli Ecosystem: Lecture provides a broad scope on elephants and wildlife conservation challenges and opportunities in the Amboseli Ecosystem	Kiringe, J.W. & Okello, M. M. 2007. Threats and their relative severity to wildlife protected areas of Kenya. <i>Applied Ecology and Environmental Research</i> . 5(2): 49 – 62 (Required) Okello, M. M. , Seno, S.K. & Nthiga, R. W. 2009. Reconciling peoples’ livelihoods and environmental conservation in the rural landscapes in Kenya: Opportunities and challenges in the Amboseli landscapes. <i>Natural Resources Forum</i> 33: 123 - 133.	3Hrs (L)	JW/All Faculty
EE 02	Land use changes in the Amboseli Ecosystem and their impact on conservation of	Okello, M. M. 2005. Land use changes and human - wildlife conflicts in the Amboseli Area, Kenya. <i>Human Dimensions of Wildlife</i> , 10(1): 19 – 28 (Required)	3Hrs(TL)	JW/RK

	<p>elephants : This field-based lecture will showcase some of the key land use changes that have occurred in the Maasai group ranches of the Amboseli Ecosystem and the threats and challenges they have created for long-term and sustainable conservation of elephants</p>	<p>Okello, M.M. and Kioko, J.M. (2010). Contraction of Wildlife Dispersal Area in Olgulului – Ololorashi Group Ranch Around Amboseli National Park, Kenya. The Open Conservation Biology Journal, 4, 34-45 (Required)</p>		
EE 03	<p>Elephant ecology and social organization: This lecture will examine key ecological and social aspects of African elephants and how they influence their conservation</p>	<p>Estes, R. D. 1991. The behavioral guide to African mammals including hoofed mammals , carnivores, and primates. Awake Forest Studium Book. Russel Friedman Books Publishers, South Africa. (Main reference)</p>	2Hrs (L)	MO
EE 04	<p>Elephant behavior and communication: Lecture will be based on long-term studies on Amboseli elephants. It will focus on key behavioral attributes of African elephants and how they communicate</p>		2Hrs(L)	MO / Guest
EE 05	<p>Trend and status of human-elephant conflicts in the</p>	<p>Okello, M.M., S.J. Njumbi, J.W. Kiringe and J. Isiiche. 2014. Prevalence and severity if current human – elephant conflicts in</p>	2Hrs(L)	RK

	<p>Amboseli Ecosystem: This lecture will examine causes, manifestations, trends and current state of human-elephant conflicts in the Amboseli Ecosystem their implications on elephants' conservation and co-existence with local communities</p>	<p>Amboseli Ecosystem, Kenya: Insights from the field and key informants. <i>Natural Resources</i> 5: 462 – 477 (Required) http://dx.doi.org/10.4236/nr.2014.58036</p> <p>Kioko J, Okello, MM & Muruthi, P. 2006. Human-elephant conflict outlook in the Tsavo-Amboseli ecosystem, Kenya. <i>Pachyderm</i> 41: 53-60 (Required)</p>		
EE 06	<p>Population status and trends of the African elephant: a continental and Kenyan perspective: Lecture will examine trends in the population of African elephant in Kenya and Africa. It will also examine the causes for the observed population trends of the species and underlying challenges</p>	<p>UNEP, CITES, IUCN, TRAFFIC (2013). <i>Elephants in the Dust – The African Elephant Crisis.</i> A Rapid Response Assessment. United Nations Environment Programme, GRID-Arendal (Required)</p>	2Hrs(L)	JW / Guest
EE 07	<p>Impacts of elephants on vegetation: In this field exercise, students will learn how to assess impacts of elephants on woody vegetation their</p>	None	4Hrs(FE)	JW

	implications on conservation of elephants and ecological integrity of protected areas			
EE 08	<p>Assessment of community attitudes towards elephants vis a vis other key large mammals in the Amboseli Ecosystem: Peoples' Attitudes shape their actions and behavior towards wildlife. Attitudes can be shaped by values and outcomes of peoples' encounters with animals. In this exercise, students will conduct focus group interviews with local Maasai communities in former Kimana Group Ranch to document their attitudes towards elephants, why these attitudes are formed and their implications on elephant conservation</p>	<p>Okello, M.M., Buthmann, E., Mapinu, B., and Kahi, C. 2010. Community Opinions on Wildlife, Resource Use and Livelihood Competition in Kimana Group Ranch near Amboseli, Kenya. <i>The Open Conservation Biology Journal</i> 4: 34 – 45 (Required)</p> <p>Browne-Nuñez, C., Jacobson, S. K., & Vaske, J. J. (2013). Beliefs, attitudes, and intentions for allowing elephants in group ranches around Amboseli National Park, Kenya. <i>Wildlife Society Bulletin</i>, 37(3), 639-648. (Required)</p> <p>Fernandez-Llamazares, A., Western, D., Galvin, K. A., McElwee, P., & Cabeza, M. (2020). Historical shifts in local attitudes towards wildlife by Maasai pastoralists of the Amboseli Ecosystem (Kenya): Insights from three conservation psychology theories. <i>Journal for Nature Conservation</i>, 53, 125763. (Suggested)</p>	4Hrs (FE)	RK
EE 09	<p>Agging and sexing in African elephants: theory: Lecture will provide elephant</p>	None	2Hrs (L)	MO

	features that are typically used to age and sex them			
EE 10	Aging and sexing in African elephants: practice: In this field exercise students will learn how to age and sex elephants in Amboseli National Park	None	3Hrs(FE)	MO / Guest
EE 11	Kenya elephant conservation strategy: a national perspective. Lecture will examine the Kenya elephant conservation strategy and challenges faced by the Kenya Wildlife Service in it's endeavor to achieve long-term and sustainable conservation of elephants in the country	Litoroh M, Omondi P, Kock R and Amin R. 2021. Conservation and Management Strategy for the Elephant in Kenya 2012-2021. Kenya wildlife Service. Nairobi, Kenya (Required)	2 Hrs (L)	JW
EE 12	Elephant count methods: This lecture will examine the rationale for counting elephants, how to conduct sample and total counts using elephant signs and actual sighting and the underlying considerations	Kioko, J., Okello, M. & Muruthi, P. 2006. Elephant numbers and distribution in the Tsavo – Amboseli Ecosystem, South – Western Kenya. <i>Pachyderm</i> 40: 61 – 68 (Required) Okello, M.M, L. Kenana, H.Maliti, J.W. Kiringe, E. Kanga, F. Warinwa, S. Bakari , S. Ndambuki, E. Massawe, N. Sitati, D. Kimutai, M. Mwita , N. Gichohi, D. Muteti, B. Ngoru and , Peter Mwangi. 2016. Population density of elephants and other	2Hrs (L)	MO

		key large herbivores in the Amboseli ecosystem of Kenya in relation to droughts. <i>Journal of Arid Environments</i> 135: 64 - 74 (Required)		
EE 13	Elephant counts in Amboseli National Park: This field exercise will be done in Amboseli N. Park, a core concentration area for the Amboseli Ecosystem elephants. Students will conduct elephant counts using ground count method, and use the data to determine the population, density and habitat associations of elephants in the park	None	4Hrs(FE)	MO
EE 14	Human-elephant conflicts mitigation: a Kenya and global perspective: Dealing with human-elephant conflicts is a very complex, challenging, and expensive undertaking. This lecture will evaluate strategies used to manage human-elephant conflicts in Kenya, South Africa and India and their effectiveness	None	2 hrs (L)	RK

EE 15	<p>Elephant movement, habitat, and space needs in the Amboseli Ecosystem: Lecture will be based on studies of collared elephants by SFS, Kenya Wildlife Service (KWS) and International Fund for Animal Welfare (IFAW) in the Amboseli Ecosystem. It will primarily focus on observed elephant's movement patterns, ranging behavior and space needs, and implications to their long-term conservation</p>	<p>Okello, M.M., Njumbi, S.J., Kiringe J.W., and Isiiche, J. 2015. Habitat Use and Preference by the African Elephant, and Management Implications in the Amboseli Landscape, Kenya. <i>International Journal of Biodiversity Conservation</i> 7(3):211-226 (Required)</p> <p>Ngene S., M. M. Okello, J,Mukeka , S. Muya , S. Njumbi and J. Isiche. 2017. Home range sizes and space use of African elephants (<i>Loxodonta africana</i>) in the Southern Kenya and Northern Tanzania borderland landscape. <i>International Journal for Biodiversity Conservation</i> 9(1): 9 – 26(Required)</p>	2Hrs (L)	JW
EE 16	<p>Determination of elephant's carrying capacity: Lecture will examine the rationale for maintaining appropriate elephant carrying capacity in protected areas including the Amboseli National Park. It will also explore potential population regulation and control and strategies for</p>	None	2Hrs(L)	MO

	Amboseli Ecosystem elephants			
EE 17	<p>Human-elephant mitigation strategies in the Amboseli Ecosystem: In this field lecture, students will examine the commonly used methods to manage conflicts between elephants and communities in the Amboseli region and their degree of effectiveness</p>	<p>Okello, M.M., Njumbi, S.J., Kiringe J.W., and Isiiche, J. 2016. Prevalence of human – elephant conflicts in Amboseli ecosystem, Kenya: Current opinions of local community. <i>International Journal for Biodiversity Conservation</i> 8(3): 60 – 71 (Required)</p> <p>Osipova,L. , M. M. Okello, S. J. Njumb, S. Ngene, D. Western, M. W. Hayward & N. Balkenhol. 2018. Fencing solves human-wildlife conflict locally but shifts problems elsewhere: A case study using functional connectivity modelling of the African elephant. <i>Journal of Applied Ecol.</i> 55(6);1–12 (Required)</p>	3Hrs(FL)	RK
EE 18	<p>Elephant metapopulations and connectivity: This lecture will explore the elephant populations in Amboseli, West Kilimanjaro (Tanzania), Namanga and Magadi/Natron (Tanzania) and explore the interrelationship and role of each of those potential population to the elephant cross border population.</p>	<p>Osipova,L. , M. M. Okello, S. J. Njumbi, S. Ngene, D. Western, M. W. Hayward & N. Balkenhol. 2018. Using step-selection functions to model landscape connectivity for African elephants: accounting for variability across individuals and seasons. <i>Animal Conservation.</i> 22:36-48 (Required)</p> <p>Okello M.M., Ngene S. and Otiende M. 2017. Connectivity between Tsavo and Amboseli ecosystems: inference using elephant population genetics from selected collared elephants. Draft Report. Centre for Wildlife Management Studies, CWMS, Nairobi, Kenya.(Required)</p>	2Hrs (L)	MO
EE 19	<p>Impacts of poaching on elephant behavior, social organization, and physical traits: Lecture will examine</p>	None	2Hrs(L)	MO

	the effects of illegal poaching on the behavior, social organization, and traits of African elephants			
EE 20	<p>The contribution of conservation NGOs in elephant conservation in Kenya: In this guest lecture, students will be introduced to catalogue of both local and international conservation NGOs that specialize on the conservation of African elephants, what they do and what locations / ecosystems they focus on. Challenges and opportunities of their work will be explored as well. (Maasai Mara expedition)</p>	<p>Derman, B. (1995). Environmental NGOs, dispossession, and the state: the ideology and praxis of African nature and development. <i>Human Ecology</i>, 23(2), 199-215. (Suggested)</p> <p>Larsen, P. B. (2018). The Good, the Ugly and the 'Dirty Harry's of Conservation: Rethinking the Anthropology of Conservation NGOs. In <i>The Anthropology of Conservation ngos</i> (pp. 17-46). Palgrave Macmillan, Cham. (Suggested)</p>	2Hrs (L)	RK /Guest
EE 21	<p>Conservation of elephants in cross-border landscapes: Lecture will focus on conservation, collaboration and challenges for elephants along the Kenya-Tanzania borderland focusing on the Mara-Serengeti Ecosystem.</p>	None	2Hrs (L)	JW / Guest

EE 22	<p>Fragmentation of the Maasai-Mara Ecosystem and its impacts on elephant conservation: Lecture will examine drivers of human demography, land tenure and land use changes in the Maasai-Mara ecosystem and their implications to long-term conservation of elephants. These changes will be compared to observed trends in the Amboseli Ecosystem</p>	<p>David S. Green, Elise F. Zipkin, Darren C. Incorvaia and Kay E. Holekamp (2019). Long-term ecological changes influence herbivore diversity and abundance inside a protected area in the Mara-Serengeti ecosystem (Required)</p>	2Hrs (L)	JW
EE 23	<p>Political economy of the Africa elephant: In this lecture, students will explore how the interplay of market and global, regional as well as national politics influence conservation strategies and challenges of the African elephant. Themes such as commodification and use of elephants, neoliberal elephants, property rights and ivory trade meshwork will be discussed</p>	<p>Duffy, R. (2013). The international political economy of tourism and the neoliberalisation of nature: Challenges posed by selling close interactions with animals. <i>Review of International Political Economy</i>, 20(3), 605-626. (Required)</p> <p>McPherson, M. A., & Nieswiadomy, M. L. (2000). African elephants: The effect of property rights and political stability. <i>Contemporary Economic Policy</i>, 18(1), 14-26. (Required)</p> <p>Duffy, R., & Moore, L. (2011). Global regulations and local practices: The politics and governance of animal welfare in elephant tourism. <i>Journal of Sustainable Tourism</i>, 19(4-5), 589-604. (Required)</p> <p>Kabiri, N. (2010). The political economy of wildlife conservation and decline in</p>	2 Hrs (L)	RK

		<p>Kenya. <i>The Journal of Environment & Development</i>, 19(4), 424-445. (Suggested)</p> <p>Moore, L. E. (2010). Conservation heroes versus environmental villains: perceiving elephants in Caprivi, Namibia. <i>Human Ecology</i>, 38(1), 19-29. (Suggested)</p> <p>Sullivan, S. (2006, June). Elephant in the room? Problematizing 'new' (neoliberal) biodiversity conservation. In <i>Forum for Development Studies</i> (Vol. 33, No. 1, pp. 105-135). Taylor & Francis Group. (Suggested)</p> <p>Moore, L. (2011). The neoliberal elephant: Exploring the impacts of the trade ban in ivory on the commodification and neoliberalisation of elephants. <i>Geoforum</i>, 42(1), 51-60. (Suggested)</p>		
EE 24	<p>Global and national regulatory frameworks for conservation of the African Elephant: Students will learn some of the regulations and regulatory bodies that govern African elephant conservation globally and in Kenya. The effectiveness of various regulatory tools will be explored, challenges identified as well as their critiques.</p>	<p>Duffy, R. (2013). Global environmental governance and north—south dynamics: the case of the CITES. <i>Environment and Planning C: Government and Policy</i>, 31(2), 222-239. (Required)</p> <p>Litoroh, M., Omondi, P., Kock, R., & Amin, R. (2012). Conservation and management strategy for the elephant in Kenya. <i>Kenya Wildlife Service, Nairobi</i>. (Required)</p> <p>Ginsberg, J. (2002). CITES at 30, or 40. <i>Conservation Biology</i>, 16(5), 1184-1191. (Required)</p> <p>Padgett, B. (1995). The African elephant, Africa, and CITES: the next step. <i>Indiana Journal of Global Legal Studies</i>, 529-552. (Suggested)</p> <p>Wasser, S., Poole, J., Lee, P., Lindsay, K., Dobson, A., Hart, J., ... & Nowak, K.</p>	2 Hrs (L)	RK

		<p>(2010). Elephants, ivory, and trade. <i>Science</i>, 327(5971), 1331-1332. (Suggested)</p> <p>Duffy, R., & Moore, L. (2011). Global regulations and local practices: The politics and governance of animal welfare in elephant tourism. <i>Journal of Sustainable Tourism</i>, 19(4-5), 589-604. (Suggested)</p>		
EE 25	<p>Culling / consumptive utilization of elephants or not? Students will watch and discuss a film on the experiences and lessons from Southern Africa about consumptive utilization of elephants</p>	<p>Kock, R. A. (1995). Wildlife utilization: use it or lose it—a Kenyan perspective. <i>Biodiversity & Conservation</i>, 4(3), 241-256. (Suggested)</p>	2 Hrs (L)	RK
TOTAL HOURS			60	