



THE SCHOOL  
FOR FIELD STUDIES

# Wildlife Management and Conservation

## SFS 3500

**Syllabus**

**4 credits**

The School for Field Studies (SFS)  
Center for Wildlife Management Studies (CWMS)  
Rhotia, Tanzania

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**

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***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, this is a field program, and the field can change.

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## Course Overview

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This course aims to expose students to community wildlife management and the complexity of sustainable wildlife conservation in Tanzania. It combines concepts and principles of ecology, wildlife management, and the human dimension, which is central to effective and sustainable wildlife conservation. During the course, students will explore the social, cultural, economic, and political context of the relationship between people and wildlife in Tanzania using the Tarangire-Manyara ecosystem as a case study. To understand past, present, and future wildlife management in the country, this course examines the influences of local people's attitudes, national land tenure regimes, and policy frameworks. It will also examine the success and failure of the involvement of local communities in conservation initiatives in the country. Wildlife conservation in Tanzania and particularly in the Tarangire-Manyara ecosystem is examined in the context of competing for land use alternatives such as agriculture, pastoralism, and agro-pastoralism.

## Case Study Overview and Background

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### Title of Case Study

The influence of biophysical and socio-cultural factors on wildlife and other natural resources within the Tarangire-Manyara Ecosystem of northern Tanzania

### Case Study Question

How can land-use practices and resource potentials found in the land contiguous to Lake Manyara and Tarangire National Parks be sustainably managed to enhance the economic livelihood of the local population and at the same time promote wildlife conservation?

### Background

The Tarangire-Manyara Ecosystem (TME) is one of the key wildlife conservation areas in Tanzania, and part of the Northern tourist circuit including the famous parks of Serengeti, Ngorongoro, and Lake Manyara, Tarangire, Arusha, and Mt. Kilimanjaro National Parks. TME is estimated to comprise about 35,000 km<sup>2</sup>. Tarangire and Lake Manyara National Parks are the core protected areas in the TME exclusively designated for photographic tourism. Other forms of protected areas in TME include Wildlife Management Areas (WMA) managed by local communities for tourism investment, game control areas (GCAs), and game reserves (GRs) managed by the Wildlife Division in which consumptive utilization such as trophy hunting is allowed. Consumptive utilization is allowed in open areas that fall under the village lands designated as hunting blocks. All protected areas in TME are not fenced, thus, wildlife moves freely between the protected areas and adjacent to dispersal areas in community village land. This leads to high levels of human-wildlife interactions and the ensuing human-wildlife conflicts.

For many decades, the primary inhabitants of the TME have been the pastoral Maasai community with low human population density. However, over the past four decades, there has been a rapid increase in the human population mainly due to immigration, with consequent changes in land use leading to the expansion of agriculture, human settlement, and peri-urban development. This has resulted in blockage of migratory wildlife routes (such as into Simanjiro plains and to Lake Manyara through Kwakuchinja and Jangwani Corridors) and habitat fragmentation and has created more opportunities for human-wildlife conflicts. These pose an increasing threat to environmental and wildlife conservation in the TME.

The Tarangire-Manyara ecosystem (TME) in the Maasai Steppes of northern Tanzania is also faced with multiple threats ranging from land-use changes, tourism proliferation, human population increase, and general ecological changes. The parks are renowned for their biodiversity in a relatively dry landscape,

but their future is in jeopardy due to insularization. There are growing land-use changes, such as large-scale farming, unplanned settlements, and an increase in human population in the dispersal areas, migratory routes, and corridors, which are necessary for the free movement of large mammalian species. Moreover, uncontrolled tourist activities and accommodations (such as campsites and curio shops) around the parks contribute to the insularization of the parks. Uncontrolled and often illegal hunting of wildlife in the dispersal and game-controlled areas outside the parks is prevalent, hence endangering critical wildlife species. Human-wildlife conflict is equally rampant, further compromising the future of wildlife conservation, local livelihoods, and harmonious co-existence between locals and wildlife.

Unplanned development of tourist accommodation facilities (such as campsites and lodges) around the parks, although benefiting the local communities, exert a high-water demand, reducing the quantity of water discharged into Lake Manyara, reducing water quality due to potential pollution from sewerage and domestic effluents. Expanding irrigation in nearby rice farms in Mto wa Mbu town, heavy siltation, pesticide application, pollution caused by erosion, and depletion of vegetation due to farming in the highland catchment areas affect the ecology and biodiversity of Lake Manyara and the adjacent wetlands. The summer 1, 2023 course will offer a series of lectures and field exercises that will be used to explore the wildlife conservation issues in the TME through a multidisciplinary approach. Student projects will focus on conducting baseline assessments, critical analysis, and investigation to produce information that will contribute toward a sustainable environment and natural resource management, and promote wildlife conservation, and livelihood improvement for local communities.

## Learning Objectives

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The main objective of the course is to expose students to various wildlife management and conservation issues in the Tarangire-Manyara Ecosystem and generally in Tanzania. These aspects are important in formulating research questions that attempt to understand conservation problems as well as associated human issues before an attempt to offer practical and viable solutions. The learning process will be achieved through interactive learning and experiential activities, including lectures by resident faculty and guest lecturers, field exercises, class discussions, and field lectures.

The specific objectives of the course are to:

1. Explore the ecology, social organization, and behavior of common African large mammals,
2. Impart basic skills in field techniques such as animal identification and behavioral ecology of larger African wild mammals, vegetation, and wildlife sampling, conducting social surveys, and participatory methods.
3. Understand wildlife conservation issues, livestock-wildlife interactions, and associated human-wildlife conflicts.
4. Understand the principles for the design and management of conservation areas.
5. Explore the role of pastoral community areas in African savanna in biodiversity conservation.
6. Obtain an understanding of the challenges to managing protected areas in Tanzania.
7. Explore the dilemma of conserving wildlife in protected areas of Tanzania amidst a rapidly changing socio-economic and political environment.
8. Understanding the key constraints to the conservation of wildlife among resource-poor rural populations

## Assessments

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Assessment Item	Value (%)
Behavioral Ecology I: Primate Behavior	20
African Elephant Lab	25
Wildlife Population Estimate Techniques	20
Final Exam	25
Participation	10
<b>TOTAL</b>	<b>100</b>

### Behavioral Ecology I: Primate Behavior (20%)

This field exercise presents an opportunity for students to interact with and observe Olive Baboons and their lifestyle in the real world. Students will employ the Focal Sampling technique to study Baboons' behavioral displays in the Lake Manyara National Park and closely observe and record baboons' behaviors, time budgets, activity patterns, and how they interact with each other and with their natural environment. Students will learn how to organize, analyze, visualize, and present information that will form the basis of a short, written assignment.

### African Elephant Lab (30%)

Students will learn how to determine the age and sex of African elephants in the Tarangire National Park using behavior and shape of morphological features. After the fieldwork, each student will write an individual report based on the collected data from the local community.

### Wildlife Population Estimate Techniques (20%)

In this field exercise, students will use the road as a transect to sample mammals found in the Manyara Ranch. Students will use various surveying tools and equipment including GPS, Range Finders, and traditional compasses. Students will be divided into three different routes during the exercise. After the fieldwork, each group will write a report based on the data collected from the field.

### Case Study Exam (20%)

A two-hour exam based on materials covered from case studies, readings, class, guest, and field lectures, discussions, videos, field exercises, and observations.

### Participation (10%)

This assessment encourages students to be prepared for each academic session. This implies reading background materials for each session with enough detail to be able to ask relevant questions and to participate in analytical discussions about the key issues. Active participation during classes, discussions, assignments, and hikes is expected. A student's ability to be a good colleague is important. Participation in class, lab group work and a general high contribution to group learning is expected at SFS. Active participation will encompass active learning in class, lab, field exercises, during expeditions, and group work. One's ability to be a strong member of a learning community will enhance the grade assigned at the end of the program.

## Grading Scheme

Grade corrections in any of the above items should be requested in writing at least 24 hours after assignments are returned. No corrections will be considered afterwards.

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

**Readings** – Assigned readings and handouts (exercises/assignments) will be available before the scheduled activities. Course readings must be read and clarification on issues sought was 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 and material of others without giving due credit is cheating and will not be tolerated. A grade of zero will be assigned if anyone is caught cheating or aiding another person to cheat actively or passively (e.g., allowing someone to look at your exam).

**Deadlines** – Deadlines for written and oral assignments are instated to promote equity among students and to allow faculty ample time to review and return assignments. As such, deadlines are firm; extensions will only be considered under extreme circumstances. Late assignments will incur a penalty of 10% of your grade for each day you are late. After two days (past the deadline) assignments will not be accepted anymore. Assignments will be handed back to students after a one-week grading period.

**Participation** – Since we offer a program that is often 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 course is mandatory, it is important that you are prompt for all activities, bring the necessary equipment for field exercises and class activities, and simply get involved.

## Course Content

**Type- L:** Lecture, **FL:** Field Lecture, **GL:** Guest Lecture, **FEX:** Field Exercise, **D:** Discussion, **Lab:** Workshop

**\*Required readings are in bold**

No	Title and outline	Type	Time (hrs)	Readings
1	<b>Case study introduction</b> Conservation issues in the Tarangire – Manyara Ecosystem (TME). This topic will define the current status of environmental and conservation reality in the ecosystem and elaborate on issues that need to be addressed for wildlife and other resource conservation to be successful.	L	2.0	Msoffe, et al. (2011).  Nelson (2005).
2	<b>Land-use changes and human activities</b> Land-use changes and human activities in the Lake Manyara catchment and their consequences on wildlife and environmental conservation. This field lecture will	FL	2.0	Tanapa (2010).  Rohde and Hihorst (2009).

No	Title and outline	Type	Time (hrs)	Readings
	expose students to the challenges facing Lake Manyara and Tarangire National Parks by observing human encroachment and the effects of agriculture, urbanization, and human settlements			Vitousek, et al. (1997).
3	<b>Wildlife Management and Conservation Principles</b> This is an introductory topic to wildlife management. It covers goals, types, approaches to wildlife management, and main activities conducted by wildlife managers in Tanzania and worldwide. Students will learn about the positive and negative values of wildlife.	L	2.0	Chardonnet, et al. (2002).
4	<b>Wildlife Management Policy in Tanzania</b> This topic will trace the origins of wildlife management and the establishment of protected areas in Tanzania (then Tanganyika) from the pre-colonial era to the contemporary network of protected areas in Tanzania. Will explore strategies and challenges in implementing wildlife policy objectives.	L	2.0	<b>Ministry of Resources and Tourism (1998).</b> <b>Stolla (2005).</b> Nelson, et al. (2010).
5	<b>Environmental Conservation Initiatives in Karatu District</b> This lecture will provide an overview of natural resource conservation issues in the Karatu district by highlighting the conservation challenges and the current initiatives.	GL	2.0	
6	<b>Field Ornithology: Greater and Lesser Flamingo</b> Students will learn how to classify, identify, and describe distinguishing characteristics of birds, and determine their age and sex using direct and indirect techniques.	FL	3.0	<b>Dale, et al. (1996).</b>
7	<b>Behavioral Ecology I: Primates Behavior</b> Students will be given an overview of the study of primate social structure. They will learn key behaviors and various terminologies that are critical for developing primate socialization ethograms. Furthermore, they will learn various techniques used in studying primate behavioral ecology. Students hear a 30-minute talk on primate evolution at the Olduvai Gorge archeological site. During the practical, students will assess the activity patterns of Olive Baboons in Lake Manyara National Park, collect data, write notes, and develop and present ethograms. This activity will constitute [20% of the coursework grade].	L; FEX	4.0	<b>Swedell (2012).</b> <b>Henazi, &amp; Barrett (1999).</b>
8	<b>Behavioral Ecology II: African Elephants</b> Students will learn key ecological aspects (such as feeding behavior, population structure ecological requirements, home range, etc.) that make elephant conservation challenging in an increasingly changing and fragmented world. Students will make close behavior-related observations of elephant clans in Tarangire National Park and apply age and sex-determination skills learned in class.	L; FEX; Lab	5.0	<b>Lohay, et al. (2020).</b> <b>Fritz (2017).</b>

No	Title and outline	Type	Time (hrs)	Readings
9	<b>Maasai Giraffe Behavior and Ecology</b> Students will be exposed to the ecology of the Masai Giraffe in Tanzania and TME, their ecology, movements, population structure, movements, and sink-source dynamics in TME. Besides, students will learn about variations in conservation status and drivers of the decline of the four Giraffe species found in Africa.	GL	2.0	<b>Lee &amp; Bolger (2017).</b>  <b>Coimbra, et al. (2021).</b>
10	<b>Community-Based Natural Resources Management (CBNRM)</b> This lecture will outline concepts and approaches to natural resource management and utilization	L; FL	4.0	Blomley and Ramadhani (2007).  Meshack and Raben (2007).  Pfliegner and Moshi (2007).  Kideghesho (2010).
11	<b>Human-Wildlife Conflicts: Causes, Challenges and Mitigation Measures</b> Students will learn how lion monitoring is conducted in the TME. They will learn some drivers, challenges/problems, and solutions to curb HWCs in the TME.	FL; FEX	4.0	Kissui, et al. (2022).
12	<b>Wildlife Population Estimate Techniques</b> This course will involve lectures, field demonstrations of distance sampling, and lab sessions where students will learn how to count wildlife in the field and estimate their populations using statistical programs such as R and Distance.	L; FEX; Lab	8.0	Griffin, et al. (2021).  Bond, et al. (2022).
13	<b>Wildlife Law Enforcement in Tanzania</b> This lecture provides students with first-hand information on how wildlife law enforcement is carried out in Tanzania. Students will learn various techniques for gathering information on poaching status in a given area.	FL; GL	2.0	
14	<b>Integrating Conservation and Human Development</b> The Case of Ngorongoro Conservation Area, Tanzania. Conservation in Ngorongoro has a unique and interesting relationships with the Maasai community. Conservation has been integrated to cater for community interests. This lecture will explore this relationship and its challenges.	FL; GL	2.0	<b>Estes, et al. (2006).</b>  Boone, et al. (2006).
15	<b>Protected Area Management</b> A case study of Serengeti National Park	L; GL	2.0	
16	<b>African Traditions, Culture, and Conservation</b> Case of Iraqw (Part I -II)	FL	4.0	

No	Title and outline	Type	Time (hrs)	Readings
17	<b>Wildlife Adaptations</b> Students will learn and describe key adaptation features (morphological, behavioral, and physiological) that enable various wildlife species to enhance their survival in a particular habitat and ecosystem. In practice, students will conduct field observations to assess adaptation features of mammals related to feeding guilds and morphological adaptations in relation to their habitats during the Serengeti Expedition.	FEX	3.0	<b>Estes (1991).</b> <b>Kingdon (1997).</b>  Parish, Rivera, and Boland (2017).
<b>Total</b>			<b>53</b>	
<b>UMN Instructional Hours*</b>			<b>63.6</b>	

\**UMN defines an instructional hour as a 50-minute block. SFS syllabi are written in full 60-minute hours for programming purposes. Therefore 50 full hours = 60 UMN instructional hours (for four credit courses) and 25 full hours = 30 UMN instructional hours (for two credit courses).*

## Reading List

### \*Required readings are in bold

- Blomley, T., and Ramadhani, A. (2007). Participatory Forest Management in Tanzania. An overview of status, progress, and challenges ahead. *The Arc Journal*, No. 21 September 2007. ISSN 0856 – 8715.
- Bond, M.L., Kiffner, C., Lee, D.E. (2022). Ungulate Populations in the Tarangire Ecosystem. In: Kiffner, C., Bond, M.L., Lee, D.E. (eds) *Tarangire: Human-Wildlife Coexistence in a Fragmented Ecosystem*. *Ecological Studies*, vol 243. Springer, Cham. [https://doi.org/10.1007/978-3-030-93604-4\\_8](https://doi.org/10.1007/978-3-030-93604-4_8)
- Boone, R.B., Galvin, K.A., Thornton, P.K., Swift, D.M., Coughenour, M.B. (2006). Cultivation and Conservation in Ngorongoro Conservation Area, Tanzania. *Hum Ecol.* 34:809–828
- Chardonnet, B. des Clers, J. Fischer, R. Chardonnet, B. des Clers, J. Fischer, R. Gerhold, F. Jori & F. Lamarque (2002). The value of Wildlife. *Revue scientifique et technique (International Office of Epizootics)*, 21 (1), 15-51
- Coimbra, R. T. F., Winter, S., Kumar, V., Koepfli, K.-P., Gooley, R. M., Dobrynin, P., ... Janke, A. (2021).** Whole-genome analysis of giraffes supports four distinct species. *Current Biology*, 31(13), 2929–2938.e5. doi:10.1016/j.cub.2021.04.033
- Dale A. Z, Donald A. T, and David J. P. (1996).** *Birds of Kenya and Northern Tanzania*
- Estes, R.D., Atwood, J.L., Estes, A.B. (2006).** Downward trends in Ngorongoro Crater ungulate populations 1986–2005: Conservation concerns and the need for ecological research. *Biological Conservation* 131: 106-120
- Fritz, H. (2017).** Long-term field studies of elephants: understanding the ecology and conservation of a long-lived ecosystem engineer. *Journal of Mammalogy*, 98(3), 603–611. doi:10.1093/jmammal/gyx023
- Griffin, A. N., Kioko, J., Theisinger, O., & Kiffner, C. (2021). Ostrich population densities and temporal dynamics in coupled social-ecological systems: Suitable indicators for the ecological effectiveness of protected areas? *Ecological Indicators*, 125, 107348. doi:10.1016/j.ecolind.2021.10734
- Henazi, S. P., & Barrett, L. (1999).** The value of grooming to female primates. *Primates*, 40(1), 47–59. doi:10.1007/bf02557701

11. Kideghesho, J.R. (2010). Wildlife Conservation in Tanzania: Whose Interest Matters? In: Conservation of Natural Resources. Some African and Asian Examples. (Edited by Gereta, E.J and Roskaf, E.), Tapir Academic Press, Trondheim. pp 82 – 110
12. Kissui, Bernard M., Elvis L. Kisimir, Laly L. Lichtenfeld, Elizabeth M. Naro, Robert A. Montgomery, Christian Kiffner (2022). Human-Carnivore Coexistence in the Tarangire Ecosystem, Pages 295-317 <https://link.springer.com/book/10.1007/978-3-030-93604-4>
13. **Lee, D. E., & Bolger, D. T. (2017)**. Movements and source-sink dynamics of a Masai giraffe metapopulation. *Population Ecology*, 59(2), 157–168. doi:10.1007/s10144-017-0580-7
14. Lindsey, P. A., Roulet, P. A., & Romañach, S. S. (2007). Economic and conservation significance of the trophy hunting industry in sub-Saharan Africa. *Biological Conservation*, 134(4), 455–469. doi:10.1016/j.biocon.2006.09.005
15. **Lohay, G. G., Weathers, T. C., Estes, A. B., McGrath, B. C., & Cavener, D. R. (2020)**. Genetic connectivity and population structure of African savanna elephants (*Loxodonta africana*) in Tanzania. *Ecology and Evolution*, 10(20), 11069–11089. doi:10.1002/ece3.6728
16. Meshack, C. and Raben, K. (2007). Balancing Rights, Responsibilities, Costs, and Benefits in the Management of Catchment Forests. *The Arc Journal*, No. 21. September 2007 ISSN 0856 – 8715 pp 6 – 7
17. **Ministry of Natural Resources and Tourism (MNRT). (1998)**. The Wildlife Policy of Tanzania. Government Printer, Dar es Salaam.
18. Msoffe F, Kifugo S, Said M, Ole Neselle M, Van Gardingen P, Reid R, Ogutu J, Herero M, de Leeuw J (2011) Drivers and impacts of land-use change in the Maasai Steppe of northern Tanzania: an ecological, social and political analysis. *J Land Use Sci* 6: 1-21 Nelson, F. (eds). 2005. Social and ecological dynamics and complexity in the Simanjiro plains: a round table discussion. Tanzania Natural Resource Forum (TNRF) workshop report number 8
19. Nelson F., et al. (2010). The Evolution and Reform of Tanzania Wildlife Management. <http://www.conservationandsociety.org> Friday, January 08, 2010
20. Pfliegner, K., and Moshi, E. (2007). Is Joint Forest Management viable in protecting forest reserves? Experience from Morogoro Region. *The Arc Journal*, No. 21 September 2007. ISSN 0856 – 8715 pp 17 – 20
21. Rohde, R and Hihorst, T (2009). A profile of environmental changes in Lake Manyara basin, Tanzania, Sunrise project
22. **Stolla, F. (2005)**. Wildlife management areas: a legal analysis. TNRF Occasional Paper No. 5
23. **Swedell, L. (2012)** Primate Sociality and Social Systems. *Nature Education Knowledge* 3(10):84
24. **Tanapa (2010)**. Lake Manyara, plenty of water, yet semi-arid area, Citizen newspaper
25. Vitousek, Peter M., Harold A. Mooney, Jane Lubchenco, and Jerry M. Melillo (1997). Human Domination of Earth's Ecosystems. *Science* 277 (5325), 494-499.[doi: 10.1126/science.277.5325.494]