Kenya: Ecology and Conservation

Center for Global Education, George Mason University

Course Credits (3):  BIOL 435; EVPP 490; NCLC 399; GGS 399

Course Duration:  January 3 – January 19, 2018

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Lecture support:  Material and lectures include those from the African Wildlife Foundation, Giraffe Manor, Sheldricke Wildlife Trust, the Ol Pejeta Conservancy, Action for Cheetahs in Kenya, the Soysambu Conservancy, and various on-site materials.

COURSE DESCRIPTION (this document is 10 pages long):

We are entering our 8th season in 2018! Kenya: Ecology and Conservation is designed to expose students to several key areas of conservation science with the additional benefit of on-the-ground field research in wildlife ecology. The areas of focus are: 1. Conservation in action (general programs, conflict issues, policies, and management practices), 2. The environment and geography of Kenya, 3. Ecosystem studies (acacia savanna, Rift Valley, grassland, others), 4. the overlap of culture and conservation, and 6. Challenges of conserving and managing wildlife.

This is a 2 week course with a major field component.

1. Conservation in action: Students will learn about ongoing conservation efforts from faculty and by visiting representatives at the African Wildlife Foundation, Action for Cheetahs in Kenya, the Mpala Research Centre, the Soysambu Conservancy, Lake Nakuru National Park, and the Maasai Mara National Reserve. Topics include land-use, mitigating habitat alteration, human-wildlife conflict, tourism, and community outreach / participation. These experiences will be brought into perspective as we see examples in person and compare/contrast to peer-reviewed literature on the subject matter.
2. Geography: To understand the challenges of conservation in Kenya, it is important to be exposed to the geography of selected ecoregions (Rift Valley, grassland acacia forests, riverine and wetland, and riparian woodland). We will approach this topic first by directly visiting unique habitats in Kenya (soda lakes / alkaline systems of Lake Nakuru / Soysambu parks; acacia savanna ecosystems in central Kenya, the dominant grasslands of the Maasai Mara, and additional habitats as possible).

4. Ecosystem Studies: We spend quality time in three main ecosystems while in Kenya: Acacia-Commiphora savanna forests (Laikipia), riverine / wetlands (Great Rift Valley), and grasslands (Maasai Mara). Each ecosystem has a unique structure and community of wildlife, and we will explore those aspects of conservation and how they differ among regions.

5. Cultural perspectives: Gaining an understanding of the local cultures in each of our destinations is an important part of appreciating the conservation efforts therein. We will visit and speak to local citizens at various locations and exchange dialogue on their perspectives of conservation. This covers a broad spectrum of topics from conflict to tourism. The differences with our own culture and conservation systems in the US present new areas of exploration.

6. Conservation of Kenya’s Megafauna: East Africa is well known for its megafauna, but protection and study of these animals present challenges that range from the ecological and biological to politics of trans-boundary conservation, ecotourism, and community conservation, and economics. We will examine strategies for their protection, current management techniques, and associated biological traits relevant to their preservation. We will also receive in-depth knowledge of how complex managing such wildlife can be by focusing on various representative species found in Kenya. Our experiences and information gathering will come from:

   - Close-up observations of megafauna and the impacts upon them via safari in various national parks, conservancies, game reserves, and research centers.
   - Discussions with key wildlife scientists, managers, park rangers, and ecotourism operators.
   - Group discussions of selected, peer-reviewed scientific literature

In addition, we will discuss the importance of ecosystem-level approaches to conservation, landscape ecology (geospatial aspects), trophic-level ecology, and how understanding animal behavior is a vital component to species preservation. For example, both large herbivores and carnivores are uniquely affected by habitat destruction:
**Herbivores:** Compared to small herbivores, large herbivores such as rhino and elephant, are more easily affected by habitat destruction and alteration, and thus are more prone to extinction. Such large-bodied mammals are at an increased disadvantage as their food requirements and wide-ranging movements become limited by human activity. In addition, they are frequently targeted for poaching and hunting, are highly displaced by development, and tend to be in direct competition with commercial ranching and small-scale livestock operations. As Kenya is home to the northern range of the spectacular migration of wildebeest from Tanzania, this event is even now threatened by human-induced changes to the landscape, along with mediated interactions from reduced densities. The biological traits of large mammals (k-selected species: slower development, longer lived, s-shaped growth curve, good competitors) combined with a need for coexistence in a human-dominated landscape, require more complex conservation strategies.

**Carnivores:** Large carnivores, such as lions, leopards, and cheetah, are also threatened by habitat loss and changes in prey availability, but more frequently engaged in human-wildlife conflicts. They occupy habitat desired for cattle and livestock grazing at various scales. Managing carnivores and the human-wildlife conflict is a complex process that involves an understanding of people’s attitudes toward wildlife, economics of the impacts on land-use, land-owner relationships, weather and climate, and natural resource availabilities.

**Course Foundation:** This course is heavily based on peer-reviewed, empirical studies in evolutionary and conservation science. Having an understanding of the 70+ million years of mammalian evolution and the remarkable adaptations to their changing environments are important in establishing reference to what we will see and experience. Science is the only clearly defined universal language on the planet and is essential to understanding biology and ecology, and thus has a profound impact on conservation efforts. Conservation without science has proven to be highly misguided, dangerous, unreliable, overtly political, or putting it simply..futile.

Smithsonian: http://www.mnh.si.edu/mammals/pages/how/index.htm

**FACULTY:**

*Ryan Valdez*, Ph.D. is a former GMU student and affiliate faculty. His interests in geospatial sciences, landscape ecology and wildlife management have brought him to focus on changing land-use in Kenya. Ryan has been fundamental in designing and instructing this course in the past.
Arndt F. Laemmerzahl, Ph.D. is a full time faculty member with the biology department at GMU. He has spent several years in Kenya and has worked with vertebrates both in Kenya and in the Unites States. He also teaches mammalogy and herpetology at GMU.

TRIP INFORMATION:

Conditions: Students are expected to be aware and accepting of the field conditions during this course: some hiking, intensive vehicular travel, multiple destinations in-country, living out of a bag the entire time, new foods!, inclement weather, Kenya’s summer (which is our winter), etc.. etc.. etc.. Anticipate; this is an interdisciplinary course on foreign soil.

Accommodations: Accommodations range from guest houses, cottages, to tented camps. None of these facilities will have air conditioning (though it is not at all necessary), and at times hot water and electricity will be limited, but always accessible. See photo albums to get an idea of the accommodations from previous trips. The showers and rooms are selected based on location and economy…. not on luxury! They are all modest – so as to make the course more affordable for you.

Transportation: Students must be able to endure long intervals of using ground transportation (safari vehicles). We will be driving between locations, on game drives, etc. – this is the only means of exploring these landscapes. The time in Laikipia may include hiking across a flat landscape and being out in the field for hours.

You will be expected to:

*** Be under the direct tropical sun for long periods.

*** Hike through landscapes with free roaming wildlife (elephant, lions, rhinos, etc.).

*** Be able to get up really early in the morning and be courteous and polite to others when you aren’t feeling your best on the trip. We want to maintain positive outlook while in our small group setting for 2 weeks. Consider the group dynamic here and that you will be in small confined spaces 24/7 for 2 weeks.

*** Drive in a vehicle for many hours on bumpy, dusty dirt roads.

*** Be willing to have pictures and video taken of you while on the course.

*** Sleep in moderate accommodations – and much of the time with a roommate.
*** Be a great team player (positive attitude!!). Zero drama!

*** Be a GOOD communicator for any reasons necessary – even if you do not feel like communicating.

If any of the above items are going to be challenging for you, you must talk to the instructor asap about whether this course is a good match for you.

Immunizations and health: Students are to be aware of all required immunizations and medications recommended by GMU’s Student Health Services. See in particular:

http://shs.gmu.edu/immunizations/

and the Center for Disease Control


Malaria medication is highly recommended, but it is up to the student to choose this. We will be in elevations above and below the malaria line during the course. It is best to be on medication during the entire trip to keep safe. Skipping this medication severely affects the ability of the medication to protect you. Keep in mind that malaria medication can be costly, and it is not advisable to obtain this medication in Kenya. It requires a prescription in the United States. Malaria medication cycles should begin a day prior to your departure, and is normally required several days after returning to the US. Larium (mefloquin) is NOT recommended. Malarone (Atovaquone/Proguanil) is more commonly used, but such medications are person-specific. You must talk to a doctor to find the right mediation for you. Never take malaria medicine without a FULL meal. More information is at:


If you require any special medications you must ensure you take enough with you (keep them in your carry on). Many medications can be difficult or impossible to obtain in Kenya.

Insurance: Please be fully aware of your insurance coverage. GMU/CGE also provides you with secondary medical insurance. You are provided full emergency evacuation and logistics involved in getting you to medical care (iNext). You should still have your own medical insurance prior to departure – to cover you in case of emergency. So it is your responsibility to check with your insurance and determine if will cover you (and how/what is the procedure for reimbursement) in a foreign country. You can also buy cheap travel insurance – which covers everything from medical expenses to lost luggage – highly recommended if you feel your personal health insurance is substandard.
To assist in any emergency, you are expected to register with the Office of Homeland Security. [https://step.state.gov/step/](https://step.state.gov/step/). CGE does not register you with the embassy or with Homeland Security – this is your personal responsibility.

*Climate:* The temperature in Kenya during this course is usually between 65° F and 85° F. These are very comfortable temperatures, where nights might be slightly chilly (ideal in a tented camp) and days are warm but without much humidity in higher elevations.

![Nairobi Climate Chart](chart.png)

*Luggage and equipment:* Students are highly encouraged to pack lightly (see KENYA CHECKLIST). One check-in bag, a carry on, and a back pack (personal item) are best. If you can knock this down to 1 large bag and 1 back pack, that is ideal. Do not place expensive items in your check-in luggage. Always keep important documents (i.e. passport), medicines, cameras and electronic equipment with you in your carry on bag (or back pack). A back pack is also ideal for daily activities during the course, for carrying snacks, beverages, and equipment of any kind. **A pair of binoculars is required** – it is an essential tool for wildlife viewing. A camera is recommended, however, the instructors and guide will have high-end cameras should any students desire copies of our photos.

For field ecology exercises – you may be asked to help transport equipment to and from Kenya. This is required and has been the case in past trips. Items such as camera traps, small mammal traps, GPS units, laser range finders, etc. are typical of the tools that we ask students to help take (note: these items are carry on only).

**COURSE ASSIGNMENTS:**

**Required Readings:** Students will choose from selected peer-reviewed, science journal paper topics to be discussed in detail over the duration of the course. Each pair of students will have a paper assigned to them and will lead a group
discussion of that topic during the course (average time about one hour). Copies of all papers will be made available prior to travel (electronic PDFs available). Small text books may be assigned closer to the date of departure – but keep in mind that you will likely have two very small books; a field guide for wildlife, and a natural history book.

If you are interested in investing further for this course, there is one valuable book: The Behavior Guide to African Mammals: Including Hoofed Mammals, Carnivores, and Primates (by Richard Estes). Amazon.com reference: http://amzn.com/0520080858. This is not encouraging you to purchase through Amazon, it is merely giving you a quick link to the book so you can properly identify it. The book is NOT required, but we offer this as one of the best book on knowing and understanding the large mammals you will see on the trip. We will have a copy of this in Kenya for you to review.

There is also a smaller, pocket size book that is really spectacular: Jonathan Kingdon’s Pocket Guide to African Mammals.

(Kingdon has also authored the rather monumental seven volume series East African Mammals. This is not recommended for purchase unless you are really (really!) interested in tremendous detail about East African Mammals. You can not take it with you in any case!)

There are also field guides available to other animals (birds, reptiles and amphibians, etc.). Ask your instructors if you are interested.

Journals: Each student will be responsible for keeping a personal trip journal of relevant activities and observations during travel in Kenya. All students have the flexibility to be creative with their own personal journals (web-based, video, scrap book, artwork, blog, essay, etc.). Creativity is highly encouraged!
Research Paper: Student science research papers are a minimum of 7 pages, and are specifically designed to provide a “status report” on your selected topic. This status report will have citations, background information, but more importantly – you will access resources in Kenya to develop this document. Interviews, meetings, on-site documentation, all discussions you have with professionals in the field. You will need to get approval for your topic from one of the course instructors no later than January 10th. Papers will be due no later than Monday, February 13th. More information on the paper will be provided at a later date but you should know that it should concentrate on information with an ecological/theoretic background.

Course Participation: Participation will be taken very seriously. Most important is your willingness to learn and apply yourself in the field. Engage in all activities, attend and contribute to all paper discussions, ask engaging questions when we meet conservation professionals. At each stage of the journey we will do our best to meet conservationists at the following locations:

- Ol Pejeta Research Centre
- Kenya Wildlife Service
- Mpala Research Centre
- African Wildlife Foundation – main office, East Africa (Nairobi)
- Lake Nakuru National Park
- Maasai Mara Game Research (hyena research camp)
- Sheldricke Wildlife Trust (rescue / orphaned wildlife)
- Giraffe Manor (endangered Rothschild’s giraffe program)

Keep in mind that it is hard to schedule a guest lecturer in the field, but we will do our best to provide them.

Course exam: Participants will be given an exam in Kenya during the last day of the course. The exam will be 50 questions of various formats; it will be comprehensive and representative of our destinations, literature articles, some orientation material, and any interaction we have with staff during the course.

Course Grading:

Lead one discussion from chosen science journal article(s): 50 points
- Thorough, well prepared, interactive,
- ask questions, generate discussion

Research Paper: 100 points
- Upper university-level, science writing, using the scientific method; the Journal of Ecology is used as a formatting reference.
Trip Journal / blog:  
Creative, comprehensive, clean, organized.  
It is expected that this is something you prepare after you return from your trip. Do not hand in old field notes. Format approval is required prior to submission (video, website, PPT, art, essay, scrapbook, etc.). Be creative!

General course participation:  
Positive behavior, get involved, ask questions.  
Much of this is based on how you respond during other participant’s paper discussions during the course - and when in the company of park rangers / biologists.

Negative behavior will impact your grade. And how you perform in the field – your willingness and cooperation.

Course exam (in Kenya):  
50 questions (various format). Long answer, multiple choice, true or false, fill in the blank, etc..

Evaluation:  
You are also required to complete and submit your course evaluation on-line just prior to departure from Nairobi.

Total:  
300 points

Students not completing any of the above requirements will receive an incomplete grade or simply lose the point value.

Please be aware that we strongly uphold the Honor Code system of GMU:  
http://www.gmu.edu/academics/catalog/9798/honorcod.html#code

PRE-DEPARTURE CLASS MEETING (Time and date TBA):  
The class will meet at least once prior to departure. This is absolutely required.

This orientation will introduce the course objectives and take students through a slide presentation of the course and destinations. We will also discuss all aspects of the trip: itinerary, content, packing suggestions, assigned readings, and our departure schedule.
You should also note that **attendance for all classes, excursions and program-related activities is mandatory.** Students will be dismissed from the program upon a third absence. Dismissal from the program will result in failure in the class (grade of F). **This is an official policy of the CGE for Study Abroad.**

**GRADUATE STUDENT CREDIT:**

Participating as a graduate student in this study abroad course is possible – but requires work on the student side. You will need to have permission from your academic advisor and your department head. The elevated academic requirements for graduate students are as follows:

1. Your research paper will need to be 14 pages (double) and at a higher level of work. This is scientific writing, so the scientific method is vital and should accompany a significant literature citations page. The Journal of Ecology should be referenced for formatting.

2. The end of course exam (last day in Kenya) will include extra questions at a higher level, commensurate with graduate research academics.

All other requirements are applied along with other students (journal, participation, etc.).

To register as a graduate student, please get in touch with one of the course instructors. It is not difficult, but does require specific steps that you will need to take.