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From May 17 – June 4, personnel from the UW Department of Zoology & Physiology organized a three-week, intensive field course entitled “Ecology and Conservation of African Savannas” at the Ewaso Ng’iro campsite on the grounds of Mpala Research Centre (MRC) in Laikipia County in central Kenya (Map 1).

The goal of our course was to

expose UW students to study formulation, data analysis, and field practices in wildlife ecology, in a one-of-a-kind setting. Our course provided unique learning opportunities to UW students that are not currently available on campus. Ten UW students and two international students were immersed in the study of the ecology and conservation of savanna wildlife (mammals and birds, principally). Students were exposed to a variety of topics provided by professors, graduate students, and local experts in the conservation of endangered species. Students, instructors, and special guests are listed in Table 1.

**Table 1. Students and Instructors.**

Irene Chepngetich, National Museums of Kenya  
Amina Farah, Hirola Conservation Programme  
Emma Fodor, UW  
Jake Goheen (instructor), UW  
Leo Khasoha (instructor), UW and Mpala Research Centre  
Lindsey Mitchell, UW  
Brooke Nieder, UW  
Sarah Plotz, UW  
Melyssa Riggs, UW  
Katie Schabron, UW  
Therese Turner, UW  
Hannah Vanderlinden, UW  
Sammy Veauthier, UW  
Foss Williams, UW

**Special guests.**

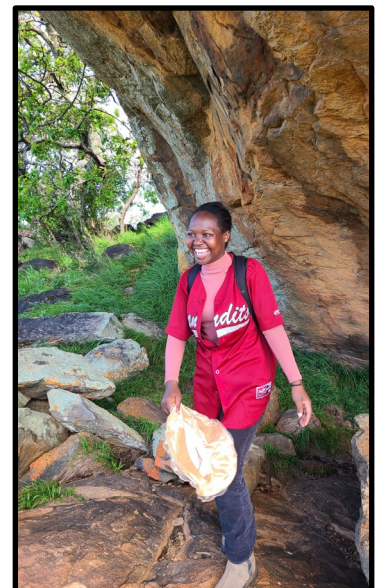
Ali Hassan, research assistant, Mpala Research Centre  
Annabella Helman, PhD student, UW and Ol Pejeta Conservancy  
Simon Lima, research assistant, Mpala Research Centre  
Mathew Mutinda, Kenya Wildlife Service  
Sam Mutisya, Ecological Monitoring Unit, Ol Pejeta Conservancy  
Wilson Nderitu, research assistant, Mpala Research Centre  
Dedan Ngatia, PhD student, UW and Mpala Research Centre

Laikipia is comprised of a mosaic of large ranches, small land holdings, and agricultural parcels in which wildlife, livestock production, and agricultural economies vie for limited resources. Despite lacking formal protection, Laikipia boasts the highest abundances of wildlife in Kenya outside the famed Maasai Mara National Reserve, thus providing a model for human-wildlife coexistence outside national parks.

The MRC was the logistical hub for our field course. The MRC is situated within the 48,000 acre Mpala Conservancy, and provides 24-hr security and basic science facilities consisting of labs and associated infrastructure.

**Course Description**

Our course was designed around several goals and foundations, and consisted of a combination of short lectures, field observations to test



the material, hands-on field techniques, exchanges with people from local villages, student-driven research projects and presentations, and wildlife viewing.

### **Goals and Foundations**

- (1) Gain knowledge and further appreciation for the ecology and conservation of savanna wildlife.
- (2) Appreciate challenges and opportunities inherent to research in wildlife ecology and conservation.
- (3) Use case studies in savannas to comprehend classic and contemporary issues in the conservation, ecology, and evolution of biodiversity, with emphasis on mammals and birds.
- (4) Gain experience in a variety of field techniques for sampling biodiversity, including trapping of small mammals, ungulates, and carnivores, mist-netting of birds, radio-telemetry, and GPS methods.



Our course was built around four pedagogical foundations.

(1) Active Learning. One of the challenges of undergraduate education in the sciences is that students can become adept at passively answering, rather than actively asking questions. This leaves students with the impression that science is just the accumulation of facts rather than a process through which knowledge is generated. To facilitate active learning, students worked in small groups to initiate and complete independent projects over the 3-

week time frame. These projects truly were “independent”; students generated research questions, designed methods to test questions, and analyzed and presented their results.

- (2) Hands-on Field Activities. Our course entailed daily, learn-by-doing activities geared toward students majoring in wildlife management and zoology. Central to this course was hands-on experience, both in terms of field activities and the practice of doing science.
- (3) Diversity and Experience of Instructors. Because of the rapport we have developed with landowners in Laikipia and professionals in Kenya in general, our course features discussions and activities with personnel from the Kenya Wildlife Service, Ol Pejeta



Conservancy, Kenyan and UW graduate students, and tribal groups. At MRC, we were able to perform fieldwork and the hands-on activities that would not otherwise be permitted.

- (4) Reciprocity. Western scientists and educators have an obligation to involve citizens of the countries in which they hold courses, both because it strengthens long-term relationships and because it is the ethical thing to do. Our field course represents a training partnership between UW and young professionals in Kenya.

### **Funding and Support**

Expenses associated with this course were partly defrayed by the UW Department of Zoology and Physiology, the UW College of Arts and Sciences, the UW Global Engagement Office, and the UW Biodiversity Institute. The UW Museum of Vertebrates loaned binoculars to students in need. Deb Olson provided expert travel assistance with flight scheduling. The Mpala Research Centre graciously and fully defrayed expenses associated with Irene Chepngetich and Amina Farah from the National Museums of Kenya and the Hirola Conservation Programme, respectively. As always, the staff at the Ewaso Ng'iro campsite were second-to-none, and were responsible for keeping us safe and well-fed. We especially thank Agnes Emungasi, Winnie Kiiru, Nelly Palmeris, Cosmas Nzomo, and Nina Wambiji for their assistance and hospitality.

Please do not hesitate to contact me if you have questions or require further information.

With thanks and gratitude for your support and interest,



Jake Goheen  
Professor of Zoology  
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day	early am	late am	pm	late pm
1	flight KA 3L 1030am	travel to Mpala	introduction/safety briefing	
2	sleep/game drive	sleep/game drive	set mammal traps/drive transects for density estimation of ungulates	
3	check mammal traps/climb Mukenya kopje/hippo pools	Leo Khasoha lecture on mark-recapture methods	set mammal traps	
4	check mammal traps/bird identification	Jake Goheen walk n' talk on acacia ants	set mammal traps/drive transects for density estimation of ungulates	
5	check mammal traps/bird netting	Leo Khasoha walk n' talk on the UHURU experiment	set mammal traps/drive transects for density estimation of ungulates	
6	check mammal traps/climb Mukenya kopje/hippo pools	Jake Goheen lecture on trophic cascades	set mammal traps/drive transects for density estimation of ungulates	
7	check mammal traps/bird identification	darasa ya Kiswahili na Irene	set mammal traps/drive transects for density estimation of ungulates	
8	check mammal traps/bird netting	Nanyuki trip--Mt. Kenya wildlife conservancy and mountain bongo conservation; animal orphanage; local restaurant	Nanyuki trip--Mt. Kenya wildlife conservancy and mountain bongo conservation; animal orphanage; local restaurant	night drive
9	Leo lecture on macroecology	tracking and capture of African wild dogs	tracking and capture of African wild dogs	drinks on Baboon Cliffs
10	pilot work for independent projects	pilot work for independent projects	Annabella Helman lecture on lion-livestock interactions	
11	OI Pejeta Conservancy--lion tracking	OI Pejeta Conservancy--lion tracking	OI Pejeta Conservancy--Sam Mutisya lecture on black rhino conservation	fútbol in the village
12	independent projects fieldwork	independent projects fieldwork	Dedan Ngatia lecture on African wild dog conservation	
13	independent projects fieldwork	independent projects fieldwork	dik-dik netting and handling	



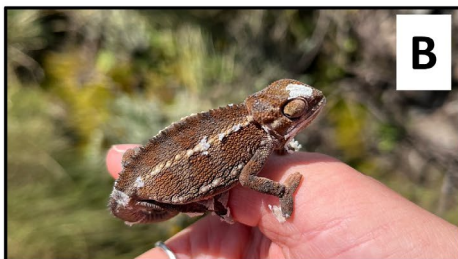




If rabbits could hybridize with deer fawns and were fans of the Ramones, the offspring might look like a Guenther's dik-dik. Mohawks are larger in males and, like humans, their ears fill with conspicuous gray hair as they age; so, this individual is an adolescent female. Large preorbital glands are used to mark boundaries of territories, and their bulbous noses are adaptations for life in arid regions. At ~150 individuals/km<sup>2</sup>, the dik-diks in Laikipia comprise one of the densest populations of wild ungulates on Earth.



A



B



C



D

Fantastic herps and where to find them. (A) a male red-headed agama, head-bobbing in attempt to attract females. (B) Aberdare Mountains dwarf chameleon, described by scientists in 2012 and only found on Mount Kinangop in the Aberdare Mountains. (C) the aptly named running frog, with a call that sounds like raindrops. (D) Sudan plated lizard, a gerrhosaur capable of delivering a wallop of a bite.





Rare is the day one sets out to find a leopard, and then actually finds a leopard. On the last morning of the course, our two field vehicles came upon this fine looking individual from opposite sides in the montane rainforest of Aberdare National Park, where we watched her scent mark for several minutes. Typical of many high elevation mammals, this female has a darker-than-usual coat.

One of three species of goshawk in Laikipia, the African goshawk is a fearsome predator of snakes, lizards, and rodents.



With some trepidation, Emma Fodor handles a giant millipede while Sarah Plotz observes from a distance.







(A) Brooke Nieder and Lindsey Mitchell follow behind UW PhD student Annabella Helman as she radio-tracks lions for her dissertation research at Ol Pejeta Conservancy. (B) We saw lions five times during our course, twice on Ol Pejeta Conservancy and three times while night-driving on Mpala.



The first and only non-negotiable item on our packing list is a can-do attitude (CDA™), exemplified here by Sarah Plotz, Irene Chepngetich, Therese Turner, and Melyssa Riggs. Flooding and torrential downpours for the first week of our course meant our trucks got stuck more than usual, but our collective CDA remained intact and unblemished.



An eastern double-collared sunbird in Aberdare National Park. Sunbirds are Old World equivalents of hummingbirds, but they fly instead of hover. Particularly at higher elevations, they replace moths and butterflies as pollinators of forbs and shrubs.





An unusual aspect of our course is that students gain experience in the capture and handling of mammals (small mammals, ungulates, and carnivores) and birds. Here, Foss Williams, capture fundi Simon Lima, and Katie Schabron make an offering in attempt to appease Madoqua, the benevolent but all-powerful dik-dik god (at left, not shown).



One fantastic byproduct of the heavy rain during our course was a biblical abundance of leopard tortoises, a species regarded as a symbol of wisdom and good luck by locals. Hannah Vanderlinden (above) strikes a pose with an old (>30 years) male, while Amina Farah (right) holds a hatchling (~6 months).







We had a “three-hyena day” midway through the course, with sightings of striped hyena (above), spotted hyena (below), and aardwolf (not pictured). Striped hyenas range from Kenya through the Sahara and Middle East to India, and they are atypical among mammals in forming polyandrous groups (several males with a single female) during breeding. They are among the least-known of large carnivores. The mating behavior and bizarre sex organs of spotted hyenas caused Hemingway to believe they were hermaphrodites, but the reality is far more interesting: they live in female-dominated societies with dominance hierarchies inherited from moms. They are found in many habitats across sub-Saharan Africa.







Our class had tremendous luck spotting four species of owls over our three weeks in Laikipia: (A) Verreaux's eagle-owl; (B) pearl-spotted owlet; (C) spotted eagle-owl; and white-faced scops owl (not shown).



Sammy Veauthier and Amina Farah lend assistance to Emma Fodor as she deftly handles an emerald-spotted wood dove under the guidance of Wilson Nderitu, Laikipia's foremost expert on identifying birds by sight, calls, and songs.





Despite frequent claims, water buffalo do not occur in Africa. But African buffalo occur across much of the southern and eastern parts of Africa. Sometimes known as “the Black Death”, this wild cow likely kills more humans than any other mammal in Africa. Lone individuals (like the one above in Aberdare National Park) tend to be most dangerous; we saw a group of ~200 at Ol Pejeta Conservancy one morning.



Lindsey Mitchell delights in handling a rufous elephant shrew, which is neither a shrew nor an elephant. Our class learned how to quantify population sizes of these and other small mammals using live-trapping and mark-recapture methods.



Katie Schabron is all smiles with this red-billed hornbill, one of the white whales from our bird netting and handling exercises. Along with Von der Decken’s hornbills, these were a frequent (albeit hard to catch) visitor at our campsites.



East African black-and-white colobus monkeys are fairly common in the montane forests of Laikipia. They lack opposable thumbs and have a chambered, ruminant-like stomach for digesting leaves.





Along with Guenther's dik-dik, impala (above) and elephants (below—but hopefully you already know what an elephant looks like) account for most of the plant consumption (i.e., herbivory) on Mpala. Impala females form harems that are defended by a single bull; bulls lacking a harem form bachelor groups that, on average, kick rivals off their harems every 1-2 weeks. Elephants exhibit matrilineal societies in which matriarchs (old, dominant females) make decisions about where and when to move, eat, and drink for the rest of the group, typically comprised of her sisters, daughters, and nieces.







River hippopotamus (hippopotami?) just outside our tents alongside the Ewaso Ng'iro. Hippo vocalizations sound like a supervillain laughing, and would unnervingly wake us at night.



Sammy Veauthier, Hannah Vanderlinden, and Lindsey Mitchell are proud of their white-browed sparrow weaver three-fer, which is not for the faint of heart. Or, as the AI Microsoft Word caption bot suggests, "A group of girls standing in a field".





In addition to mark-recapture methods, students in our course also learned about distance sampling methods: driving line transects to enumerate wildlife populations. Here, Foss Williams pauses from the monotony of counting dik-dik and impala to take a photo. Judging by the reaction of Melyssa Riggs, it was something really cool.



A sow and piglet giant forest hog, largest of the wild pigs. Although they occur across much of Equatorial Africa, Aberdare National Park is one of the few places they can be reliably seen.

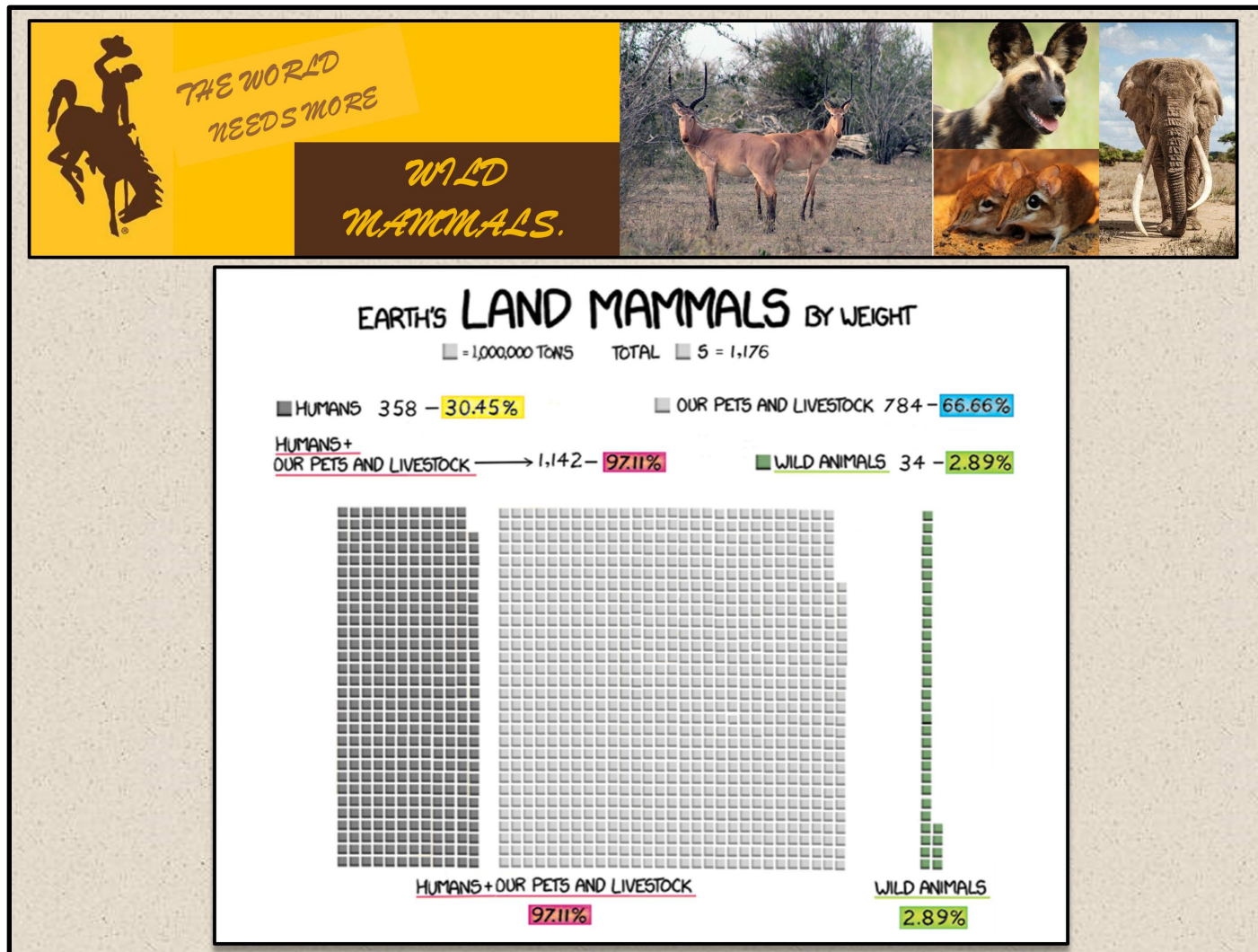


Giraffe taxonomy is, as the youth might say, a hot mess: depending on your perspective, there is either one, or four, or seven species. Giraffes in Laikipia are reticulated giraffes, which are regarded either as subspecies or full species.





With a global population of 5000-7000 individuals, African wild dogs are one of the rarest carnivores on Earth. For comparison, there are approximately 33 times more wolves and 150,000 times more domestic dogs on the planet. The Laikipia population of African wild dogs is exceptional for at least three reasons. First, it is the only one (out of 39 globally) that is increasing. Second, it is tolerant of humans and their livestock, at least at low densities. And third, it subsists largely on dik-dik. (A) Along with a member of UW PhD student Dedan Ngatia's research team (left), Brooke Nieder, Therese Turner, and Emma Fodor assist Dr. Mathew Mutinda from the Kenya Wildlife Service in drawing blood and extracting parasites from an African wild dog. (B) Following reversal of chemical immobilization, this individual rears its head to rejoin its pack, none the wiser.



The World Needs More Wild Mammals™. Across the globe, the collective weight of humans, their livestock, and their pets (a total of 10-15 mammalian species) is >20 times more than the remaining ~6490 species of mammals combined. Frequently, it is stated (1) that there needs to be a balance between the interests of humans, and those of nature; and (2) that diversity is really important.

Many in our class were inclined to agree with these statements, particularly in light of the data illustrated here.

Source: "Harvesting the biosphere". Smil, V. 2011.





Sammy Veauthier (foreground) photographs Therese Turner, Irene Chepngetich, Sarah Plotz, Foss Williams, Katie Schabron, Hannah Vanderlinden, and instructor Leo Khasoha at Chania Falls.





The 2024 Field Course in Ecology and Conservation of African Savannas on Ol Doinyo Lesatima. Left-Right (Front): Therese Turner, Irene Chepngetich, Sarah Plotz, Melyssa Riggs, Sammy Veauthier, Emma Fodor, Brooke Nieder. Left-Right (Back): Amina Farah, Jake Goheen, Foss Williams, Hannah Vanderlinden, Katie Schabron, Lindsey Mitchell.