

UNIVERSITY OF WYOMING

30 June 2014

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In May 2014, faculty from the UW Department of Zoology & Physiology and the Haub School of Environment and Natural Resources organized a three-week, intensive field course entitled “Ecology and Human Dimensions of Wildlife Conservation in East Africa” at the Ewaso Ng’iro campsite on the grounds of Mpala Research Centre (MRC) in Laikipia County in central Kenya.

The goal of this course was to expose UW students to field practices in wildlife ecology and human dimensions of wildlife management. The course provided unique learning opportunities to UW students that are not currently available to students on campus. Fifteen UW students and two Kenyan students from Karatina University were immersed for three weeks in the study of the ecology and conservation of savanna biodiversity within the context of challenges and opportunities inherent to human-occupied landscapes. Students were exposed to a variety of conservation topics provided by professors and graduate students, a professional wildlife biologist from the Wyoming Game and Fish Department, and Kenyan experts in savanna ecology and human/wildlife interactions and management. Table 1 lists the students and instructors who participated in the course.



Table 1. Students and Instructors, Kenya Field Course, 2014.**US Students****(UW unless noted)**

| | |
|--------------------|---|
| Kenny Askelson | BS, Wildlife and Fish Management |
| Christian Bopp | BS, Wildlife and Fish Management |
| Debra Boro | MS, Biology, University of New Mexico |
| Britt Brito | BS, Zoology |
| Megan Dudenhoeffer | BS, Zoology and Russian |
| Jessica Grunow | BS, Zoology, concentration in Ecology |
| Luke May | BS, Zoology, concentration in Aquatic Biology |
| Ryan McCafferty | BS, Zoology |
| Dawn Moon | BS, Zoology, minor in Statistics |
| Elizabeth Oaster | BS, Zoology |
| Karissa Rybicki | BS, Zoology |
| Auesta Safi | MFA, Creative Writing and ENR |
| Bonnie Saville | BS, Zoology and ENR |
| Nathan Thompson | BS, Wildlife and Fish Management |
| Jean-Paul Willson | BS, Zoology |

Kenyan Students

| | |
|---------------|---|
| Dedan Kabuu | BS, Natural Resources Management, Karatina University |
| Lydia Ochieng | BS, Natural Resources Management, Karatina University |

Instructors

| | |
|------------------|--|
| Courtney Carlson | Academic Programs Director, UW Haub School of ENR |
| Adam Ford | PhD Student, U British Columbia Dept of Zoology |
| Jake Goheen | Assistant Professor, UW Dept of Zoology and Physiology |
| Brett Jesmer | PhD Student, UW Dept of Zoology and Physiology |
| Tony Mong | Wildlife Biologist, Wyoming Game and Fish Department |
| Steve Smutko | Professor, UW Haub School of ENR |

Guest Lecturers

| | |
|------------------|--|
| Bernard Amakobe | Department of Ornithology, National Museums of Kenya |
| Douglas Kamaru | OI Pejeta Conservancy |
| Stephen Kinyua | Laikipia Wildlife Forum |
| Gilbert Momanyi | Laikipia Wildlife Forum |
| Sarah Montgomery | Daraja Academy Girls' School |

Laikipia, the Mpala Research Centre, and the Ewaso Ng'iro River Camp



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. Four cultures, Turkana, Maasai, Samburu, and white Kenyan, predominate and hold and implement divergent values in various portions of the region. Despite being formally unprotected, Laikipia boasts the highest abundances of wildlife in Kenya outside the famed Maasai Mara Reserve, thus providing a model for human-wildlife coexistence outside national parks.

The MRC was the logistical hub for the field course.

The MRC is situated within the 48,000-acre Mpala Ranch, provides basic science facilities consisting of labs and associated infrastructure including 24-hr security. The students explored much of Mpala Ranch while on wildlife observation excursions, conducting field research, and engaging in field-based lectures.

Course Description

The course is designed around six learning outcomes and consists of a combination of short lectures, field observations to test and confirm the lecture material, hands-on field techniques, socio-cultural exchanges with people from local villages and towns, student-driven research projects, and wildlife viewing and sightseeing.

Learning Outcomes

- 1) Gain knowledge and further appreciation for the ecology and conservation of savanna biodiversity.
- 2) Appreciate challenges and opportunities inherent to wildlife conservation in human-occupied landscapes through exposure to Kenyan cultures.
- 3) Use case studies in savannas to comprehend classic and contemporary issues in the conservation, ecology, and evolution of biodiversity, with emphasis on mammalian biodiversity.
- 4) Use case studies in savannas to understand contemporary issues in human-wildlife conflict, and the effect of social, cultural, and economic attributes on residents' values, beliefs, and attitudes toward wildlife.
- 5) Gain exposure to intellectual infrastructure (i.e., museums, wildlife-related government agencies, and universities), wildlife management, and conservation biology in a developing country.
- 6) Become proficient in a variety of field techniques for sampling biodiversity, including trapping of small and medium-sized mammals (rodents, shrews, elephant shrews, mongooses, dik-diks); mist-netting songbirds and bats; camera trapping of large mammals (large predators and ungulates); radio-telemetry; GIS and GPS methods.

The course is built around four pedagogical foundations: active learning, hands-on field activities, diversity and experience of instructors, and social and cultural reciprocity.

1) Active Learning. One of the most persistent shortcomings of undergraduate education in the sciences is that students become adept at passively answering, rather than actively asking questions. This leaves

students with the impression that science is simply the accumulation of facts rather than a process through which to generate knowledge. To facilitate active learning in this course, students worked in small groups to initiate and complete independent projects over the three-week time frame. These projects truly were “independent”; the students generated research questions, designed methods to test the questions, and analyzed and presented their results. This year, students developed projects to 1) investigate whether elephants purposefully create favorable conditions for the production of preferred forage (i.e., do elephants create gardens?); 2) understand dik-dik territory use; and 3) predict species’ responses to the construction of glades (open spaces) in savanna ecosystems.

2) *Hands-on Field Activities.* Our course entails daily, learn-by-doing activities geared toward juniors and seniors majoring in ecology, natural resources, wildlife conservation, and related fields. Central to this course is hands-on experience, both in terms of field activities and the practice of doing biodiversity science. The skills taught in this course included animal trapping and handling, camera trapping and analysis, and radio telemetry.



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 1) personnel from the National Museums of Kenya; 2) wildlife managers from the Laikipia Wildlife Forum, a local membership-based conservation organization specializing in the adoption of conservation-compatible systems of land use outside of protected areas; 3) Ph.D.-level graduate students, who gave field-based lectures on their research; 4) a Wyoming Game and Fish biologist skilled in ungulate management and trapping techniques; 5) a Kenyan researcher at Ol Pejeta Conservancy specializing in large mammal conservation; and 6) tribal elders at a Turkana village. At the Mpala Research Centre we are able to perform field experiments and the aforementioned hands-on activities that would not otherwise be permitted in Kenya, and East Africa in general.

4) *Reciprocity.* Western scientists and educators have an obligation to involve nationals of the countries in which they conduct research and teaching activities, both because it strengthens long-term relationships and because it is the ethical thing to do. Our field course represents one of two modules in a training partnership between UW and young professionals in Kenya. Consequently, two students from Karatina University in Karatina, Kenya joined our 15 UW students, and the resulting cultural exchanges occurring between students significantly enhanced the course.



This particular course represents the second of what we hope will become a biannual offering through UW, and also one of two facets of a cross-institutional training partnership that we are creating between UW and Kenyan institutions. The second facet of this program will continue in Fall 2014 with the arrival of two MSc students majoring in fields related to ecology and conservation.

Course Content

Classroom Activities (5% of course time):

1. Herbivory and plant defenses
2. Human dimensions of wildlife management and human-wildlife conflict
3. Body size and large-herbivore ecology
4. Models of wildlife management
5. Trophic cascades in savanna ecosystems
6. Effects of socio-economic variation on wildlife distribution, richness, and abundance
7. Lessons in Swahili taught by our two Kenyan students

Field Excursions and Outings (70% of course time):

1. Field excursion within Mpala Ranch to observe ant-plant symbiosis
2. Field excursion within Mpala Ranch to observe cattle herding practices and speak with herders about human-wildlife conflict
3. Travel to west Laikipia to learn about the effectiveness and challenges of elephant exclusion fences
4. Field excursion within Mpala Ranch to observe herbivore-plant interactions
5. Travel to a Turkana village to learn about challenges and opportunities faced by local pastoralists
6. Travel to Ol Pejeta Conservancy to track lions using radio telemetry, and observe other wildlife not occurring in Mpala such as white and black rhinos
7. Birding on Mpala Ranch
8. An overnight trip to Aberdares National Park to experience tropical montane forest ecosystems
9. A daytrip to Nanyuki to visit a wildlife orphanage, Daraja Academy – a school for gifted, economically disadvantaged girls from all parts of Kenya – and do some shopping
10. Picnics and day hikes to some notable landmarks on Mpala Ranch
11. Numerous daytime and nighttime excursions throughout Mpala Ranch for wildlife viewing



Field Methodologies (25% of course time):

1. Small mammal trapping and handling
2. Mongoose trapping and handling
3. Small antelope (dik-dik) trapping and handling
4. Animal tracking using radio telemetry
5. Bird netting and bat netting
6. Camera trapping
7. Experimental design
8. Habitat modeling
9. Data analysis and presentation

A day-by-day course itinerary is contained in Table 2.

Table 2. Course Itinerary, Kenya Field Course, 2014.

| Date | Duration | Activity |
|-------------|-------------------|--|
| 11-May | All day | Travel to Kenya |
| 12-May | Evening | Arrive in Kenya |
| 13-May | Morning | Deliver volumes of Journal of Mammalogy to National Museums of Kenya; drive to Mpala |
| | Afternoon/Evening | Orientation to Mpala Research Centre; evening drive and wildlife observation |
| 14-May | Morning | Course orientation; Lecture: Herbivory and plant defenses |
| | Afternoon/Evening | Introduction to journaling; Swahili lesson; night-drive wildlife observation |
| 15-May | Morning | Lecture: Human dimensions of wildlife management and human-wildlife conflict |
| | Afternoon/Evening | Field experience: Cattle production on Mpala Ranch; night-drive wildlife observation |
| 16-May | Morning | Lecture: Body size and large-herbivore ecology |
| | Afternoon/Evening | Introduction to trapping: small mammals, meso-carnivores, dik-dik; night-drive wildlife observation |
| 17-May | Morning | Check traps; Lecture: Trophic cascades and the ecology of fear |
| | Afternoon/Evening | Rest and relaxation |
| 18-May | Morning | Bird netting and birding field trip; picnic at Clifford Campsite |
| | Afternoon/Evening | Set traps |
| 19-May | Morning | Check traps; Lecture: Models of wildlife management |
| | Afternoon/Evening | Set traps |
| 20-May | Morning | Check traps; human-elephant conflict field observation |
| | Afternoon/Evening | Human-elephant field observation |
| 21-May | Morning | Visit Nanyuki Wildlife Orphanage, shopping and lunch |
| | Afternoon/Evening | Visit Daraja Academy |
| 22-May | Morning | Introduction to research projects; begin research projects |
| | Afternoon/Evening | Work on research projects; set traps |
| 23-May | Morning | Check traps; work on research projects |
| | Afternoon/Evening | Work on research projects; set traps |
| 24-May | Morning | Check traps; work on research projects |
| | Afternoon/Evening | Rest and relaxation; night-drive wildlife observation |
| 25-May | Morning | Lecture: The human dimensions of wildlife conservation in Laikipia County, Kenya; day hike to Clifford's rocks |
| | Afternoon/Evening | Rest and relaxation |
| 26-May | Morning | Visit Ol Pejeta Wildlife Conservancy for lion tracking and rhino viewing |
| | Afternoon/Evening | Ol Pejeta Wildlife Conservancy; bat netting at MRC |
| 27-May | All day | Visit Muthira manyatta for interaction with Turkana tribe and discussion of local issues |
| 28-May | All day | Travel to Aberdares National Park |
| 29-May | All day | Aberdares National Park and Chania Falls |

| | | |
|--------|-------------------|---------------------------------|
| 30-May | All day | Work on research projects |
| 31-May | All day | Work on research projects |
| 1-Jun | Morning | Research project presentations |
| | Afternoon/Evening | Rest and relaxation; goat roast |
| 2-Jun | Morning | Depart Mpala for Nairobi |
| | Evening | Depart Kenya |
| 3-Jun | Afternoon/Evening | Arrive US |

Funding and Support

This course could not have happened without the generous investment of your time and financial support. We raised over \$30,000 USD in donations to partly defray expenses associated with this course for UW students. These donations came from the Biodiversity Institute, the Haub School of the Environment and Natural Resources Program, the International Programs Office, and the Department of Zoology and Physiology.

The students and I were and continue to be astounded by your generosity. Your investment was worth it. Thank you.

Please do not hesitate to contact us if you have questions or require further information, and thank you again for your support and generosity.

Sincerely,

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Brett Jesmer
Department of Zoology and Physiology

Tony Mong
Wyoming Game and Fish Department

Student Quotes

"This trip has changed my perspective on wildlife. In Wyoming it's a "ducks and bucks" attitude. While over here, people are living on the landscape directly with wildlife, and have a very different perspective." – Luke May

"Coming to Kenya has given me a wider, global perspective on wildlife issues. People think about wildlife differently here than they do in Wyoming or Colorado." – Nathan Thompson

"This course really changed me. I was able to just jump into the unknown and get the most out of it. I really grew on this trip." – Ryan McCafferty

"It is important for us to understand the connection between ecology and people and how people and wildlife interact on the landscape." – Auesta Safi

"You can be in the outdoors all you want, but there is still a disconnect between you and wildlife, and you don't really know it. I now have a huge respect for wildlife. It is a whole different perspective of what I understand about wildlife. This trip changed me in that now I have a very different sense of the world." – Kenny Askelson

"From my childhood, I've watched National Geographic videos, and it feels like I'm in one now. All the animals are walking off the TV screen and into my life." – Megan Dudenhoeffer

"This trip has enhanced my love of wildlife. It has made it clear to me that I want to devote my life and career to working with wildlife." – Liz Oaster

"Kenya lived up to everything I could have hoped for." – Jessica Grunow



1. Kenny Askelson and Brett Jesmer are intrigued by this leopard tortoise, symbolic of both wisdom and good luck. Mpala Research Centre.



2. Crowned crane. Ol Pejeta Conservancy.



3. Karissa Rybicki ponders an elephant femur. Mpala Research Centre.



**4. An intimidating welcome.
Mpala Research Centre.**



5. Laikipia houses one of the largest elephant populations in East Africa. We saw elephants most days on this course. Mpala Research Centre.



**6. This two-lined chameleon considers eating a fly from the clutches of a UW student.
Mpala Research Centre.**



7. Sometimes, we even looked at plants. Mpala Research Centre.



8. Giant forest hogs are the largest pigs in the world; large males (like the handsome fellow second from the left) can weigh over 600 pounds. Despite its size, this species was described by scientists only about 100 years ago. Aberdares National Park.



9. Our course was not for the fastidious. Jessica Grunow, Deborah Boro, and Lydia Ochieng know that you can tell a lot about a mammal by what it leaves behind. Arranged from left to right, the dung of warthogs, giraffe, hares, zebra, impala, buffalo, and elephant. Mpala Research Centre.



10. J.P. “The Natural” Willson attempts to befriend an orphan giraffe by bribing it with some delicious celery. Mt. Kenya Animal Orphanage.



11. It is hard to conceive of a mammal cuter than the bush hyrax. Early taxonomists (correctly) guessed it was related to elephants because of shared features in the feet. Hyrax are restricted to rock piles in Laikipia, much like pikas in Wyoming. Mpala Research Centre.



12. Christian Bopp, Megan Dudenhoeffer, and Nathan Thompson troubleshoot a drop-net in anticipation of capturing Guenther’s dik-dik, an 8-pound antelope. Mpala Research Centre.



**13. Tony Mong and Ryan McCafferty work quickly to disentangle a dik-dik from the drop-net.
Mpala Research Centre.**



**14. Dawn Moon (left) and a rufous elephant shrew she recently trapped.
Mpala Research Centre.**



**15. A rosy-patched bush shrike. We saw about 150 species of birds on the course.
Mpala Research Centre.**



16. Kenny Askelson is apprehensive about the zebra in the background, recently killed by a lion. Megan Dudenhoeffer thinks Kenny's nervousness is really funny. Mpala Research Centre.



17. A lioness gnaws on a buffalo carcass. We saw lions five times on this course. Ol Pejeta Conservancy.



18. We exercised regularly throughout the course. Lydia Ochieng, Auesta Safi, and Karissa Rybicki exhibit great fortitude in conquering Mukenya kopje, a 800 foot rock with a spectacular view. It is not clear how they got down. Mpala Research Centre.



19. This black-and-white colobus monkey has successfully trained Bonnie Saville to hold her arm at a perfect 45° angle. Colobus monkeys have digestive systems similar to ruminants and are the only primates without opposable thumbs. Mt. Kenya Animal Orphanage.



20. Nathan Thompson catches two katydids in the act, and interrupts them for a photo op. Mpala Research Centre.



21. The majestic tawny eagle, fearsome predator of baboons and other monkeys. Mpala Research Centre.



22. Clockwise from bottom left. Liz Oaster, Luke May, Deborah Boro, Tobias Otieno, Mohamed Mahmoud, Karissa Rybicki, and Alois Wambua delight in recording data on small mammals. Mpala Research Centre.



23. Nathan Thompson and Jessica Grunow are all smiles as they work on their independent project to understand how browsing by elephants creates more grass in the savanna. Mpala Research Centre.



24. Christian Bopp, J.P. Willson, and Jessica Grunow photographing hippos. Karissa Rybicki lurks in the bush at the right. Mpala Research Centre.



25. Liz Oaster deftly removes a songbird from a mist net for measuring and banding with staff from the National Museums of Kenya. Mpala Research Centre.



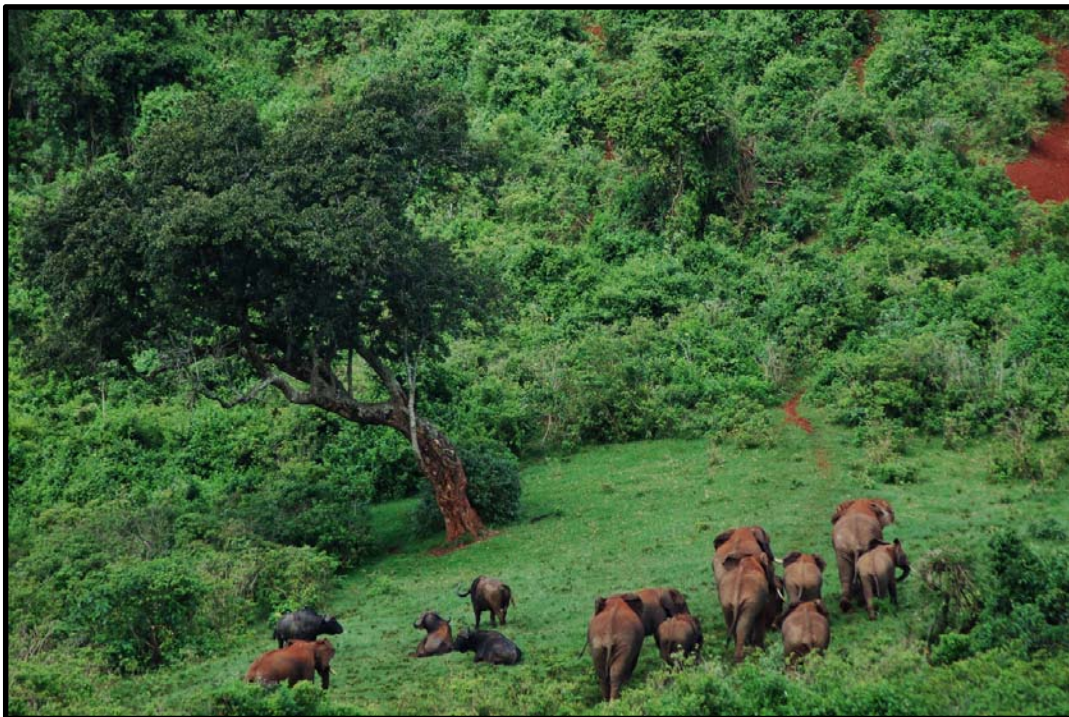
26. Megan Dudenhoeffer poses with a fringe-tailed gerbil, recently eartagged for a mark-recapture study. No gerbils were harmed during the making of this class. Mpala Research Centre.



27. We had incredible luck seeing leopards on this course, with 8-10 sightings over the course of three weeks. One even lived in our campsite. Mpala Research Centre.



28. There are few things more entertaining or gratifying to young Kenyan men than winning footraces against young mzungu men. Luke May facilitates cultural exchange right before losing a footrace to Simon Lima (center) and Dedan Kabuu (right). Megan Dudenhoeffer, Jessica Grunow, and Auesta Safi observe intently. Muthira manyatta.



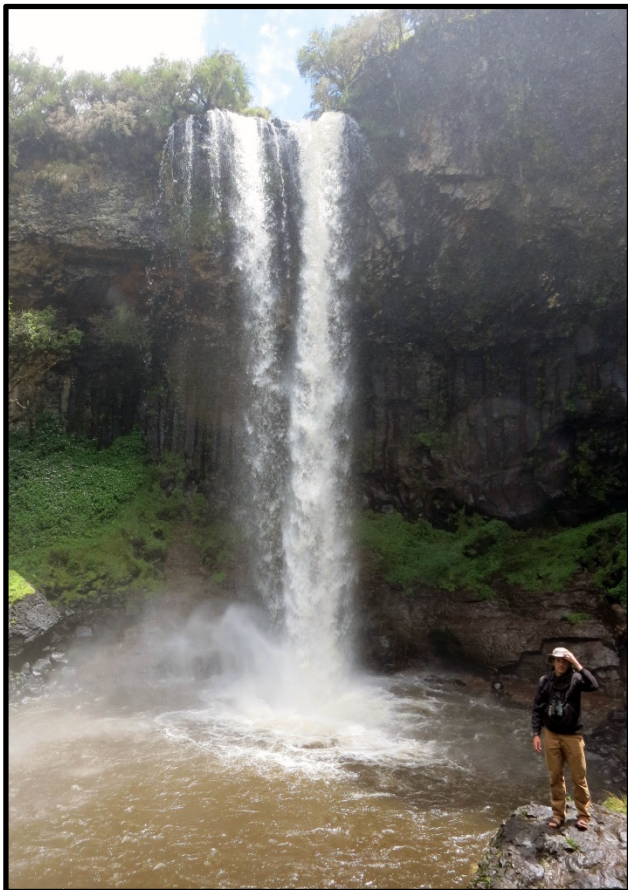
29. Welcome to the jungle. We spent two days in the Aberdares, an Afromontane rainforest with an abundance of elephants, buffalo, and giant forest hogs. Aberdare National Park.



30. Britt Brito expertly handles a individual from Family Molossidae (the free-tailed bats) after netting it. This species had not been recorded in Laikipia prior to our course. Mpala Research Centre.



31. Karissa Rybicki holds a superb starling after catching it in yet another net. Mpala Research Centre.



32. Luke May at Chania Falls. Aberdare National Park.



33. J.P. Willson and a Turkana woman, donning an ostrich-feather headdress. Muthira manyatta.



34. Grevy's zebra are one of the most endangered large mammals in the world, with fewer than 5000 remaining globally. Laikipia is their last remaining stronghold. Mpala Research Centre.



35. Guenther's dik-dik are identified by their small size (7-12 pounds), proboscis, orange face, and mohawk. There are an estimated 7500 living on Mpala. Members of our class made new discoveries about the social lives of this species for their independent project. Mpala Research Centre.



36. We visited Daraja Academy, an all-girls science and math magnet school in which students are selected throughout the country based on merit and need. Dawn Moon, Liz Oaster, Bonnie Saville, Britt Brito, and Brett Jesmer smile for the camera with two Daraja students.
Daraja Academy.



**37. Breakfast and morning study time at the Mpala Ewaso Ng'iro campsite.
Mpala Research Centre.**



38. Sunset in Laikipia County. Road to Nanyuki.



37. Class photo for 2014 UW Ecology and Human Dimensions of Wildlife Conservation in East Africa.

From back left: Londore (lastname?), Steve Smutko, Brett Jesmer, Auesta Safi, Benson (lastname?), Bonnie Saville, Kenny Askelson, Jessica Grunow, Jake Goheen, Megan Dudenhoeffer, Liz Oaster, Lydia Ochieng, Karissa Rybicki, Adam Ford, Britt Brito, Deborah Boro, Luke May, Nathan Thompson, Romato Manyas, Joseph Aziz Longore, Ryan McCafferty, Dawn Moon, unidentified askari

From front left: Lentikwa Lendare, Christian Bopp, Mary Corcoran, Dedan Kabuu, J.P. Willson, Simon Lima.