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RISKING LIFE AND TAIL

MONITORING MOVEMENT



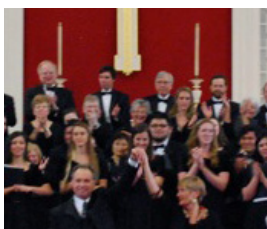
Researchers Laura Bidner and Lynne Isbell consider the complex relationships among leopards, vervet monkeys, and baboons, and how new GPS collars will answer some crucial questions.

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SINGING FOR CONSERVATION

A REFLECTION ON COMMUNITY CONSERVATION DAY

DISCOVERY DAY 2014



Laurel Harvey thanks the Deer Creek Chorale for their generous support to the George Small Outreach Fund. Their concert this past year raised nearly \$12,000 for Mpala.

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RISKING LIFE AND TAIL

Laura R. Bidner, Lynne A. Isbell



Most researchers at Mpala are all too familiar with the cheeky vervet monkeys that inspect vehicles, labs, bandas, and dorm rooms for unsecured snacks. But are the vervets that live at the Center (and often sleep on the roof of the NSF lab) more protected from leopard predation than those that live away from humans along the Ewaso Nyiro River? Are baboons safer from leopards than vervets because they spend less of their day in the dense riverine bush that is prime leopard hunting ground?



A collared Vervet monkey

Although we know that leopards eat both baboons and vervets, and vervets have specific alarm calls for leopards while baboons can go on the defensive and kill leopards, there is still a lot we do not know about the interactions between leopards and these two, well-studied primate species. One main reason that it is so difficult to study predation on any primates is that primate research typically involves human observers following their study groups on foot from dawn to dusk. There is some evidence that stealthy predators such as leopards avoid these human observers. Leopards are also most active at night when human observers are away

from their day-active primate study groups.

We started a project in December 2013 that incorporates GPS collars, voice recorders, and camera traps to investigate predator-prey interactions among leopards and baboons and vervets without the problems of human observer-based studies of these primates. GPS collars are programmed to record spatial longitude/latitude coordinates at regular intervals by communicating with satellites. These collars are critical to our study because they enable us to see where the collared animals are in relation to each other while minimizing human influence on leopard movements.



A collared leopard

In January, with the help of field assistant Wilson Longor, Sweetwaters Chimpanzee Sanctuary Deputy Manager and veterinarian George Paul, KWS veterinarian Matthew Mutinda, Living with Lions researcher Steven Ekwanga, professional wildlife trapper Dairen Simpson, and UC Davis graduate student Eric Van Cleave, we captured and fitted 16 primates and three female leopards with remote GPS collars.

continued on page 3...

...continued from page 2

We had just finished deploying all the collars when a young uncollared male leopard showed up in our camera trap at the Hippo Pools, a small glade next to a bend of the Ewaso Ng'iro River on Mpala. Since one of our main goals is to intensively monitor the Hippo Pools primate sleeping site, we scrambled to get another collar made and in March we placed a fourth collar on a young male leopard.



Dairen Simpson, Lynne Isbell, Laura Bidner, and Matthew Mutinda place a collar on a leopard.

The collars and cameras are providing a tremendous amount of information on the movements of leopards, vervets and baboons. The collars are synchronized to record the geographic locations around the clock of each collared individual every 15 minutes. In addition to the questions raised above, we want to know how often leopards get close to the primates, and when a leopard is close during the day, how often, how quickly, and at what distances the primates move away, or behave as if they are unaware of this secretive predator's presence. Thus far we have lost three collared vervets (one at the Center and two at the Hippo Pools) and one collared baboon to predators, but none of these to any of our collared leopards. A camera trap at the Hippo Pools also caught an uncollared male in the act of carrying off a freshly killed uncollared baboon before dawn one day in June.

In addition to collecting data from the collars and camera traps, we take daily censuses of the vervet groups at the Center and Hippo Pools

to check for missing individuals. We also have voice recorders set up at the Hippo Pools and Baboon Cliffs, a rocky region located on the escarpment that is home to a large troop of baboons, to pick up alarm calls given by the primates during the night. We are finding that primates do not always give alarm calls at night when leopards are nearby. Like humans, it is difficult for them to see at night, and this undoubtedly contributes to their vulnerability during the dark hours despite refuging in tall trees and on cliffs and lab roofs.

The field portion of our study will continue until January next year when we will attempt to recapture and remove all collars. The information we are collecting will expand the knowledge of leopard-primate interactions to a much greater depth than was possible before the arrival of GPS technology and we look forward to analyzing the data after our fieldwork is finished. We also hope that this year-long field study will serve as a pilot study for future research on the leopard population at Mpala. ■

[return to title page](#)

MONITORING MOVEMENT

Michael Butler Brown and Dan Rubenstein



Merril McCauley

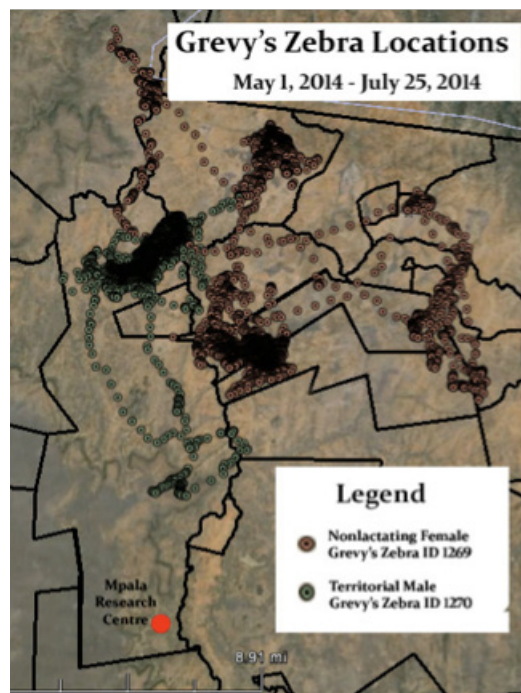
Michael Brown, Jasmin Upton, Hussein Ibrahim and Matthew Mutinda take samples from a darted Grevy's zebra.

“There remains an investigation of the common ground of any sort of animal movement whatsoever”. Taken from a translated version of *De Motu Animalium*, Aristotle’s treatise on movement, these words are over 2000 years old, but they still highlight the fundamental goals of an important aspect of ecology. Although Aristotle may have been blessed with intellectual brilliance to aid in the contemplation of movement ecology, he did not have a global positioning system (GPS). Taking advantage of advances in technology, researchers at Mpala are gaining insights into animal movement and space use that would have drawn the envy of even the most enlightened Greek forefathers.

Over the past few years, researchers at Mpala have embarked on studies tracking the movements of a wide range of species including: lions, wild dogs, hippopotamuses, hornbills, bustards, leopards, vervets, baboons, and impala. Using cutting edge tracking devices - and more than a bit of old fashioned field work - biologists at Mpala are working to

untangle the complicated suite of environmental and social cues that influence an animal’s use of space. Earlier this year, the zebra project expanded this body of work by outfitting six plains zebra and six Grevy’s zebra with GPS equipped collars to better understand factors contributing to movement behaviors of these spectacular equids.

With the assistance of a Kenyan Wildlife Service veterinary crew, our team spent five days driving, darting, tracking, roping and safely deploying GPS units on our target animals. The collars transmit the location data to our laptops, allowing us to monitor individuals remotely, thus minimizing potential disruptions of movement behaviors with tracking.



continued on page 5...

MONITORING MOVEMENT



...continued from page 4

These efforts in monitoring zebra movement are an important addition to our studies of zebra ecology. We are getting glimpses of how the two species of zebra perceive their environment and respond to changes over time. The information is already challenging the way we view zebra and supplement our long-term monitoring of zebra demographics over the Laikipia landscape. For example, although we know that mature Grevy's zebra stallions typically defend small territories, we have tracked one territorial male in northern Mpala that regularly makes forays from his core area all throughout Mpala, including one foray that extended over 13 kilometers down to the airstrip. We also have monitored one female Grevy's zebra that seems to like life in the group ranches of the Naibunga Conservancy better than on Mpala and spends most of her time in Male and Mukogodo. Contrary to our expectations, Grevy's zebra on Mpala rarely visit neighboring Ol Jogi



Matthew Mutinda

ranch, even though we have evidence to suggest that zebra regularly cross the Ewaso Ngiro River. Using these insights derived from the collars, we reviewed our multi-year survey data to confirm that less than 3% of all identified individuals over the past 3 years have been observed in both Mpala and Ol Jogi. Additionally, we have strong evidence to suggest that Grevy's zebra avoid moving on black cotton soils whereas plains zebra regularly do so. Not only is this information essential to the understanding of the basic ecology of zebras, but it also enables us to understand how zebra move across the various properties surrounding Mpala, providing useful information for conservation management of these charismatic species. ■



Michael Butler Brown

[return to title page](#)

SINGING FOR CONSERVATION

Laurel Harvey



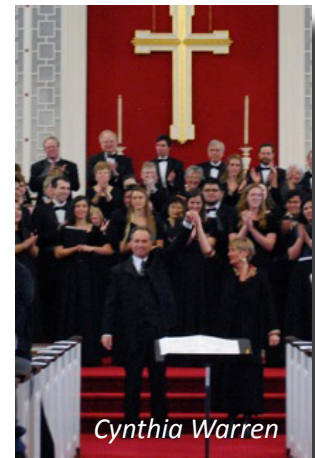
The giving continues among friends of George Small. Many of you may know Jeff Gonya, trustee of Mpala Wildlife Foundation and Marty Banghart, Director of the Deer Creek Chorale, an intergenerational community choir based in the greater Baltimore area. Both Jeff and Marty were good friends of George Small, and wanted to honor George's legacy of benefitting school-children in Kenya. Last September, the Mpala Wildlife Foundation trustees were notified that the Deer Creek Chorale, selected the George Small Outreach Fund as the beneficiary of their 2013-2014 concert season. For several months, volunteers, including Jeff, Marty and the Deer Creek Chorale's Director of Development, Stephanie Davis, planned this special event.

The world renowned Mt. San Antonio College Chamber Singers from Walnut, CA. were featured at the benefit concert on March 30th, 2014. Chamber Singers, which was formed in 1994 by director Bruce Rogers, consists of 37 auditioned singers who perform works from the Renaissance through new works of the 21st century which, in performance, are often staged. During the past 20 years, the choir has won numerous awards including 3 platinum medals at the Xinghai Prize International Choir Championships in China and in 2007, received more awards than any choir in the 60 year history of the International Eisteddford

in Llangollen, Wales including the Pavarotti Trophy and the title of "Choir of the World".

Despite wintry weather, the choirs performed to a full house. The music was diverse – from Mozart to traditional spirituals to contemporary. My favorite song was "Loch Lomond" the traditional Scottish folk tune arranged by Johnathan Quick. All too soon, the concert had ended and sponsors and choir organizers were invited to a post-concert dinner reception at the home of Jeff and Ann Gonya. At dinner, Bruce Rogers, the Director of the Mt. San Antonio College Chamber Singers, expressed interest in touring Kenya with the Chamber singers. It would be a fantastic opportunity to experience the beauty, harmonize the voices, and make new music across Kenya. I agreed to scout out possible venues during my visit next June and report back.

The concert raised around \$12,000 for the Mpala George Small Outreach Fund (www.mpala.org). This fund supports the wildlife conservancy in Kenya, a primary school for employee's children, the Mpala Mobile Clinic and a scholarship program for higher learning. On behalf of all MWF trustees, I would like to express deepest thanks to Marty Banghart, Stephanie Davis, the Deer Creek Chorale members, and the Mt. San Antonio College Chamber Singers. ■



[return to title page](#)

A REFLECTION ON COMMUNITY CONSERVATION DAY

Dayton Martindale



Katherine Miller

Il Motiok students perform a traditional Masai song and dance for the presentations at this year's Community Conservation Day.

While I wasn't there, the first Community Conservation Day was probably a relatively small affair. Nancy and Dan Rubenstein had started Northern Kenya Conservation Clubs--an after-school program they had devised to encourage respect for nature and sustainable living--at four different schools, and the Day was an opportunity to bring them together. Now, six years later, the Clubs have spread to 11 different schools. On July 5, several hundred students showed up from all over the area to Kimanjo Secondary School for a full day of fun games, and sharing of ideas.

I had been working with the Clubs for the three weeks leading up to this year's Day, and most of that time was spent preparing for the big event. Most schools were still busy working on their written essays for the "Species on the Edge" contest, the winners of which would be announced to the community, and awarded with a book prize. The assignment was to take the first-person perspective of an endangered or threatened species, and explain yourself, your habitat, why you are endangered, and how humans might help. Some of this was a little tricky, especially for the younger kids with a more tenuous grasp of English, but I

was very impressed with how they all pulled it off.

Community Conservation Day isn't just about giving away prizes. Each school had to prepare two things: a display and a presentation. The displays ranged from poems about giraffes to one school's account of combating soil erosion to a how-to on making biogas fuel. I am continually amazed at the ambition and industry involved in these projects.

continued on page 8...



Katherine Miller

Ewaso students present 'Animal Actions'

A REFLECTION ON COMMUNITY CONSERVATION DAY



...continued from page 7

We collected each display beforehand so that as people arrived, they were the first thing to peruse.

I felt that the presentations, however, were particularly exciting. Some were poems, or songs (my favorite, taking the form of an elephant addressing a human, included such immortal lines as: "When I see you, I see poisoned arrow / When I smell you, I smell gunpowder"). There were two riveting dramas (short plays), while other schools did games. While many of the primary students had been timid in the classroom, I was proud of their performance before the crowd. The secondary school played a game called More or Less, and one student really seemed like he was born to host a game show.

After all this had come to an end, the prizes had been given away, the speeches had been made, and the students--many not used to venturing so far--had been ferried back home (coordinating the logistics of transportation, by the way, had been no



Katherine Miller

Kimango Secondary School demonstrates the educational game 'More or Less' with help from the audience.

easy feat), then it was okay to relax. To our relief and pleasure, the presentations and displays the kids had worked so hard on had gone off without a hitch. When I visited the schools the next week, almost every student had seen a project or an activity from another school that they wanted to do with their own Club. By any standard, Community Conservation Day was a great success. ■

[return to title page](#)



Katherine Miller

MPALA RESEARCH CENTRE'S DISCOVERY DAY

JULY 19, 2014



21 researchers from the Mpala community presented their work to visitors at Discovery Day on July 19. Over 250 visitors from local communities, commercial ranches, high schools, Nanyuki businesses, and elsewhere got a taste of the variety of research that goes on at Mpala through brief presentations followed by opportunities for questions and discussions during lunch.



VIEW THESE PRESENTATIONS
AT:
<http://www.slideshare.net/PiafMpala>

Photos by Katherine Miller and Laura Budd

FRIENDS OF MPALA



Donor support allows Mpala to focus on our core goals of education, outreach and wildlife conservation and every donation, no matter the amount, is important to us. We offer our heartfelt thanks to all our Friends of Mpala listed below who generously contributed to our 2013 annual fundraising drive.

Margaret Kinnaird, Executive Director

NDOVU SOCIETY (>\$5,000)

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 Banovich Wildscapes Foundation
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 Chester Zoo
 Deer Creek Chorale, Inc.
 Disney Worldwide Conservation Fund
 Eisenhart, Christopher
 Fox, Robert
 Graham, Donald & Ingrid
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 Keller, Dennis & Connie
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 Levinson, Frank
 Ludwig, Bruce
 McBean, Edith
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KUDU SOCIETY (\$1,000-\$5,000)

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 Cleveland Metro Park Zoo
 Dupkin, Manuel II
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 Keesey, Horace
 Kindig, Joseph & Silvia
 Kinsley, Bob & Ann
 Lanahan, Michael & Leslie
 Linneman, Peter & Kathleen
 Lotze, Michael & Joan Harvey
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 Meeker, Elisabeth
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 Taylor, Louise
 Woellner, Margaret
 Wolf, Connie-



GREVY'S ZEBRA SOCIETY (<\$1,000)

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 Brown, Michael
 Brown, Elinor
 Budd, Ralph & Lenore
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 Chen, Elena
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 Hamilton, Gloria
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 Harvey, Nancy & Robert
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 Hendrickson, John
 Hendrie, Agnes
 Henjum, Pamela
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 Hickok, Lauree & Gregory
 Higgins, James & Karen
 Humphrey, William
 Jacobs & Berger
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 Webb, Patricia R.
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 Winstead, Mr. & Mrs. Thomas
 Witt, Nancy
 Wright, Steve & Dayle
 Zero, Vincina



This list is comprised of the publications related to Mpala Research Centre released within the first half of this year:

Dolrenry, S., J. Stenglein, L. Hazzah, R.S. Lutz, & L. Frank. 2014. Metapopulation approach to African lion (*Panthera leo*) conservation. *PLOS ONE* 9:e88081.

Kartzinel, T.R., J.R. Goheen, G.K. Charles, E. DeFranco, J.E. Maclean, T. Otieno, T.M. Palmer, R.M. Pringle. 2014. Plant and small mammal responses to large-herbivore exclusion in a semi-arid African savanna: the first five years of the UHURU experiment. *Ecology* 95:787.

Keesing, F. and T.P. Young. 2014. Cascading consequences of the loss of large mammals in an African savanna. *Bioscience* 64:487-405.

Kimuyu, D.K., R.L. Sensenig, C. Riginos, K.E. Veblen and T.P. Young. 2014. Wild and domestic browsers and grazers reduce fuels, fire temperatures, and acacia ant mortality in an African savanna. *Ecological Applications* 24:741-749

Louthan, A.M., D.F. Doak, J.R. Goheen, T.M. Palmer, and R.M. Pringle. 2014. Mechanisms of plant-plant interactions: concealment from herbivores is more important than abiotic-stress mediation in an African savannah. *Proceedings of the Royal Society B* 281:20132647.

Martins, D.J., S.E. Miller, M. Cords, M.T. Hirschauer, C.B. Goodale. 2014. Observations on an irruption event of the moth *Achaea catocaloides* (Lepidoptera: Erebiidae) at Kakamega Forest, Kenya. *Journal of East African Natural History* 103(1):31-38.

Ngatia, L.W., K.R. Reddy, P.K.R. Naira, R.M. Pringle, T.M. Palmer, and B.L. Turner. 2014. Seasonal patterns in decomposition and nutrient release from East African savanna grasses grown under contrasting nutrient conditions.

Agriculture Ecosystems and Environment 188:12-19. <http://dx.doi.org/10.1016/j.agee.2014.02.004>

Petipas, R.H. and A.K. Brody. 2014. Termites and ungulates affect arbuscular mycorrhizal richness and infectivity in a semi-arid savanna. *Botany* 92:233-240.

Pringle R.M., J.R. Goheen, T.M. Palmer, G.K. Charles, E. DeFranco, R. Hohbein, A.T. Ford, C.E. Tarnita. 2014. Low functional redundancy among mammalian browsers in regulating an encroaching shrub (*Solanum campylacanthum*) in African savannah. *Proc. R. Soc. B* 281: 20140390. <http://dx.doi.org/10.1098/rspb.2014.0390>

Scott, S.E., R.S. Copeland, M.E. Rosati and P.D.N. Hebert. 2014. DNA barcodes of Microlepidoptera reared from native fruit in Kenya. *Proceedings of the Entomological Society of Washington* 116:137-142.

Toth, A.B., S.K. Lyons, A.K. Behrensmeyer. 2014. A century of change in Kenya's mammal communities: increased richness and decreased uniqueness in six protected areas. *PLoS ONE* 9(4): e93092. doi:10.1371/journal.pone.0093092

Young, H.S., D. Rodolfo, K.M. Helgen, D.J. McCauley, S.A. Billeter, M.Y. Kosoy, L.M. Osikowicz, D.J. Salkeld, T.P. Young, K. Dittmar. 2014. Declines in large wildlife increase landscape-level prevalence of rodent-borne disease in Africa. *PNAS* 111(19):7036-7041. doi:10.1073/pnas.1404958111

Yusuf, A.A., I. Gordon, R.M. Crewe & C.W.W. Pirk. 2014. Prey choice and raiding behaviour of the Ponerine ant *Pachycondyla analis* (Hymenoptera: Formicidae). *Journal of Natural History* 48:5-6, 345-358. DOI: 10.1080/00222933.2013.791931

[return to title page](#)

MPALA-AT-A-GLANCE:

COURSES, GROUPS & RESEARCH



- 9 students from Princeton and Columbia Universities participated in a 3-month semester abroad course in Ecology and Evolutionary Biology. The group also traveled to Lewa, Amboseli, and Ol Pejeta.
- 29 students from Cornell University participated in a 1-month field course on Behavioral Ecology and Conservation.
- 5 students from McGill University visited as part of a Canada Field Studies in Africa course.
- 60 Minutes Australia filmed Laurence Frank and his Living with Lions team's current lion research activities.
- 15 Leeds University masters students participated in their annual 3-week ecology course, where they gained first-hand experience carrying out field research and an understanding of conservation and wildlife management challenges.
- 20 students from the University of Florida participated in a 3-week field biology course. Students conducted research and saw wild dogs, lions, leopards, and many elephants.
- 35 people took part in an LWF workshop for Kenyan magistrates discussing the new wildlife bill strategies for reducing wildlife crimes through appropriate fines and persecution.
- 25 people participated in a workshop with the Mt. Kenya Trust to train scouts in monitoring and enforcement for prevention of wildlife crimes.
- 27 Kenyan magistrates and KWS staff participated in a 3-day wildlife law training workshop hosted by Space for Giants and KWS.
- 14 students from Goshen University and 4 Kenyan undergraduates took part in a 3-week conservation biology and research course.
- 60 visitors participating in an educational tour of Kenya with Wilderness Adventures came to MRC for a tour of the facilities and to hear presentations from 10 researchers.
- Daniel Alfayo, Chris Chesire, and Claris Reteti, stayed at Mpala for three months to conduct research as Meeker Family Fellows. Isaac Nyabuto did research for his undergraduate thesis on elephant distribution.



Michael Butler Brown



- 21 girls from the Daraja Academy Transition Program came for a day of activities to foster a network of support, encouragement, and friendship to last throughout the Transition Program and beyond. The Daraja Transition Program welcomes girls who have graduated from Daraja Academy back to campus where they learn crucial life skills and participate in internships before going on to university.
- Mpala held its first Daraja Mentorship Day of 2014 on July 12. 29 Form 1 students from Daraja Academy visited Mpala, where they got the opportunity to conduct field research with Mpala researchers. The girls learned about everything from photosynthesis to collaring leopards, and got a first-hand taste of how science can be applied in the field.

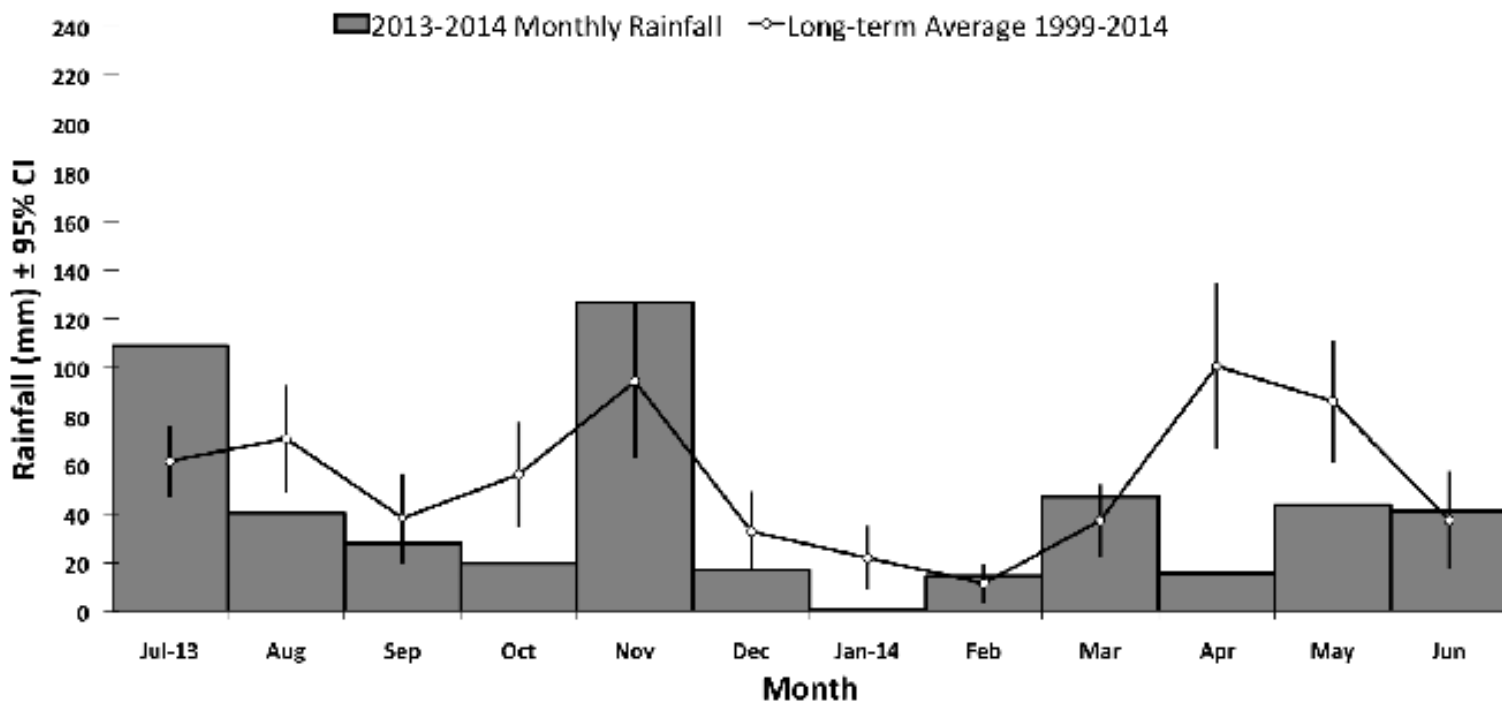


- A trainer from Kisumu visited the Daraja Academy to train the Transition Program girls on the use of I-Care reusable sanitary pads as part of the Mpala Girls Empowerment Program. The Daraja students will now use the knowledge gained to train young women in the local communities on hygiene and women's empowerment.
- On July 17, Mpala researcher Laura Budd gave a talk at the Daraja Academy as part of the Women in Conservation Lecture Series. She spoke about her experiences in veterinary school and pursuing a career in veterinary medicine.
- Conservation Clubs from the 11 schools in the Northern Kenya Conservation Club program as well as groups from the Daraja Academy and Musul Primary School participated in Community Conservation Day on July 5. Each school group shared their knowledge about the environment and conservation through posters, songs, poems, games, and dramas.



[return to title page](#)

MRC RAINFALL 2014



MPALA WILDLIFE FOUNDATION & MPALA RESEARCH TRUST

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