



MPALA MEMOS

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MPALA RANCH: THEN & NOW



COURTESY OF MARKĚTA SLABOVÁ

In the final issue of Mpala's 20th anniversary year, we look at the history of Mpala Ranch since its purchase by the Prince and Princess of Czechoslovakia in 1933.

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WILD DOGS, CHEETAHS, & COMMUNITY COEXISTENCE



HELEN O'NEILL

Stef Strebel, of the Kenya Rangelands Wild Dog & Cheetah Project, discusses conservation efforts that aim to minimize human-wildlife conflict.

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MONITORING THE PULSE OF KENYA



JULIA SIGNELL

Julia Signell, of the ecohydrology lab, explains a new project that aims to increase the availability of information about water in order to combat food security issues in Kenya.

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SENSE OF SMELL



SALLY GOODMAN

Elephant researcher, Sandy Odour, talks about elephants' extraordinary sense of smell, and their ability to distinguish the scent of their own species.

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INDIRECT INTERACTIONS



GEORGE WANG

Read about current research on the complex relationship between the Sodom apple plant (*Solanum camptolacanthum*), mammals, and insects.

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MPALA LIVE! LAUNCHES



COURTESY OF VALERIE MAY

Valerie May discusses the launch of Mpala Live! and its exciting features. The live cameras allow people worldwide to experience the wonders of Mpala.

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As the research centre's twentieth anniversary year nears its end, we think about the property's extensive history. Recently, Mpala received a visit from Markéta Slabová, of the Czech National Heritage Institute, who is contributing to a book on the Schwarzenbergs, a prominent aristocratic family in the Austro-Hungarian Empire. Adolph and Hilda Schwarzenberg were avid conservationists and pivotal in the development of Mpala Farm. I talked with Markéta as well as ranch manager Mike Littlewood to learn about the Schwarzenbergs and their role in Mpala's past.

1890

Prince Adolph Schwarzenberg was born. At his birth, his family was one of the richest and most powerful families in Austria-Hungary.

When the democratic republic of Czechoslovakia was born after WWI, aristocracy lost its former position in the country. The Schwarzenbergs lost about two thirds of their former property to land reforms.

1918

Adolph traveled to Sudan, his first trip to Africa, and fell in love with the continent.

1930

1930 - 1931

Adolph married Princess Hilda of Luxembourg and Nassau. The two spent their honeymoon hunting in Sudan, Belgian Congo, and Kenya, and grew particularly fond of Kenya.



The main house

1933

Adolph and Hilda purchased Mpala Farm (actually, rented it for 999 years) from the British Wilmot family, naming it 'Mpala' because of the abundance of impala. Adolph found comfort in owning the property, in case Bolshevism spread throughout Europe.

1934 - 1938

A dam was completed in 1934, constructed by Roy Home, who was the manager of the farm at the time. A powerhouse was started by Viktor Cibulka and finished in 1938 by Jan Dvořák after Cibulka's death in 1937.

Both men as well as all material for the powerhouse, including the turbine, came from Czechoslovakia. The dam allowed for irrigation, with channels leading to different points on the farm. Mpala also raised dairy cows and pigs, and exported butter.



Viktor Cibulka

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MPALA RANCH: THEN & NOW

WWII began. Adolph, who was known for his adamant anti-Nazi opinions, escaped Czechoslovakia and went to the US. Adolph hired Max Benies, a Jewish friend from Czechoslovakia to work as the new manager of the farm, potentially saving his life from the Nazis. During the war Mpala supplied the British colonial army with milk, butter, and pork.

1939

Max Benies



1945

Hilda Schwarzenberg built a small bridge across the Ewaso Ng'iro, making the journey to town much easier. The bridge was located just below the current bridge road from Mpala to Nanyuki.

The manager's home



1949

Adolph and Hilda visited Kenya for the last time, spending Christmas at Mpala.

1950

Adolph died on February 27th while living in Italy.



A massive flood left the dam, weir, and turbine all underwater. Sam Small did not claim flood damage to do repairs, leaving the dam out of commission for more than 20 years.



1962

1952

After the death of Max Benies, Hilda sold Mpala to Sam Small.



1969

The Mpala properties were given to George Small by his brother Sam. George focused on conserving Mpala's wildlife and providing Mpala's many employees with sufficient livelihoods and resources.



1984

Ranch manager Mike Littlewood was given permission by George to restore the dam and turbine for power generation.



1989 George established the Mpala Wildlife Foundation and Mpala Research Trust to fulfill his vision of conservation.

WILD DOGS, CHEETAHS AND COMMUNITY COEXISTENCE IN NORTHERN KENYA

STEFANIE STREBEL

Over the course of a decade, the Samburu-Laikipia Wild Dog Project witnessed an eight-fold increase in the numbers of wild dogs in the project area of Samburu, Laikipia and Isiolo districts. Starting in 2014, we expanded our work to include cheetahs, and we seek to build on our success with wild dogs as the Kenya Rangelands Wild Dog & Cheetah Project!

Kenya's rangelands support globally important populations of both wild dogs and cheetahs, but their survival continues to depend on the maintenance of vast landscapes of wildlife-friendly habitat. Adults of both species have been recorded to have home ranges over 2,000 km² and space on this scale is in short supply: only a handful of areas less than 10,000 km² are able to support populations of these increasingly threatened species. The future survival of cheetah and wild dogs will greatly depend upon sharing the landscape with people.

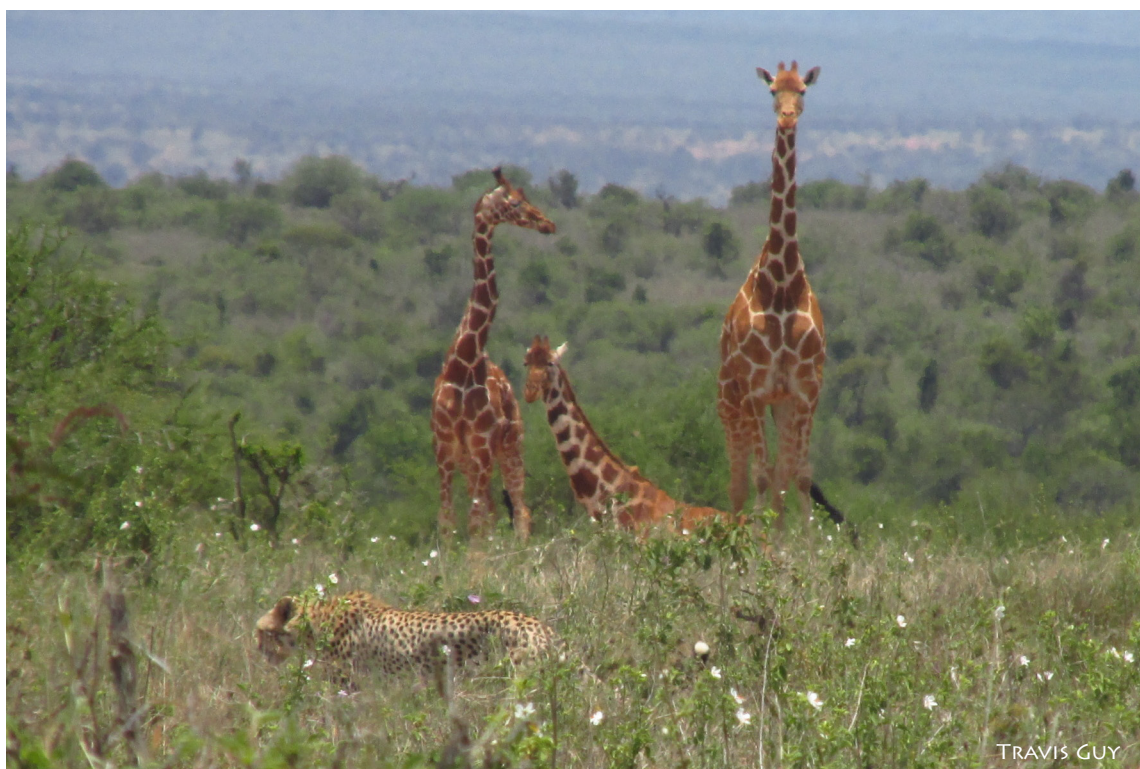
The Kenya Rangelands Wild Dog & Cheetah project is concerned with promoting the sustainable coexistence

of African wild dogs and cheetahs with local communities through a variety of approaches. An important part of our work focuses on tracking the movements of cheetah and wild dogs to identify important corridors and other landscape linkages that promote connectivity. We use this information to identify key areas where we work to foster and maintain an understanding and tolerance of wild dogs and cheetahs in local communities. One of the most successful tools we use to bring our research messages to the communities that live with these predators is interactive theatre.

In collaboration with the Zeitz Foundation and the participatory Segera Theatre Outreach Group, consisting of community members from around Segera ranch we have developed a short play about coexistence with wild dogs and cheetahs. This highly flexible tool allows us to broach the contentious subject of depredations in a relaxed, interactive and fun manner, and discuss both sides of the issue while allowing us to communicate our research findings about coexistence with wild dogs. The theatre group currently performs

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North of the research center, a cheetah slinks through the grass as a group of giraffes look on.



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WILD DOGS, CHEETAHS AND COMMUNITY COEXISTENCE IN NORTHERN KENYA

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at community markets and Zeitz Foundation's Laikipia Unity League football matches across Laikipia and Isiolo counties, reaching a broad range of audiences of all ages. Pre- and post-performance questionnaires about people's attitudes towards wild dogs and cheetah are already yielding some interesting and promising results about this communication method, and show a great deal of enthusiasm for promoting the conservation of these iconic species.

Our day-to-day work at Mpala Research Centre continues as usual, filled with radio-tracking, spoor surveys and photo-IDs. Life is never dull with these enigmatic species. We've had a great time practicing our cheetah follows across the rocky escarpment, and most of the wild dog packs near Mpala are currently denning, so we have been treated to a lot of pregnant mothers and adorable puppies.

If you have seen any wild dogs or cheetahs, or if you have any photos, we would love to hear about it!

Contact us at: wilddogcheetahproject@gmail.com. Both cheetah and wild dogs have a unique coat pattern that remains the same throughout their life, and your information and photos will help us build up our database of their movements and ranges. •

WILD DOG AND CHEETAH FACTS:

IN **WILD DOG** PACKS, ONLY ONE MALE AND FEMALE HAVE PUPPIES, AND THE REST OF THE PACK HELPS TO RAISE THEM.

A **CHEETAH'S** SPOTS ARE LIKE HUMAN FINGERPRINTS -- EVERY PATTERN IS UNIQUE AND CAN BE USED FOR IDENTIFICATION.



The Segera Theatre Outreach Group performs their play about human-wildlife coexistence.

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In the Mt. Kenya watershed small-scale farmers are highly dependent on rain-fed and stream-fed agriculture. This type of agriculture requires farmers to make a myriad of small decisions over the course of the season. The first ones are obvious: what, when, and how much to plant. But after those first choices have been made, there follows a slew of other questions: whether to weed, whether to fertilize, whether to use pesticides, whether to irrigate. These decisions all help determine how a farmer allocates resources, and making educated decisions is critical to ending up with enough food for the year.

The judgments that farmers make are based on experience, but the final outcome of their harvest is based on environmental parameters. It was once fairly easy to predict when rains were going to come and when streams would fill, flood, or run dry. Farmers could make decisions based on previous years and have reasonable chances of reaping an adequate harvest. However, with the onset of climate change, rainfall and stream flow are becoming increasingly less predictable. This puts farmers at risk of making choices that, although historically valid, may no longer prove successful.

At Mpala, researchers Kelly Caylor (Princeton University) and Tom Evans (Indiana University) are collaborating to pilot a new project known as *Impacts of Agricultural Decision Making and Adaptive Management on Food Security in Africa*, which will address this issue. The project has two components: Phones for Farmers, and PulsePods. Phones for Farmers uses SMS messaging to better understand the timeline of decision making among farmers. To do this, the team develops a series of questions that are texted via the cellular network to 1000 farmers in Kenya throughout the growing season. Meanwhile 500 **PulsePods**, affordable environmental data loggers, will be placed across Kenya. PulsePods are being developed by Professor Caylor's lab and seek to provide an inexpensive method of logging high frequency environmental data, such as temperature, precipitation, radiation, humidity, pressure,

and soil moisture. Pulse Pods collect from up to eight sensors and store the information internally before pushing it (again via text messages) to the internet.

Currently, both elements of this project are still in the process of being implemented, but once they are fully established they have the potential to fill a substantial gap in available information. Lack of both temporally and spatially resolute data in many regions of the world makes climate modeling difficult and often leads to inaccuracies. The data that we do possess tend to have either high temporal resolution but occur at only one specific location (such as the meteorological data that we collect here at Mpala), or to have high spatial resolution but a broad timeframe (such as monthly rainfall data available from numerous stations across the country). We hope that PulsePods will help resolve this problem and allow us to make more accurate drought and crop forecasting models. Once these models are improved, forecasts will be made with confidence, enabling us to give information back to the farmers who rely on it. •



The ecohydrology team installs a PulsePod at the Mpala primary school.

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Elephants are known for their acute sense of smell and are commonly seen lifting their trunks to sample the air for scents. What has puzzled me most while monitoring elephants on Mpala Ranch in central Kenya is how the families that I monitor respond differently to certain scents. The recent behavior I observed of two families reacting to rotting carcasses led me to wonder if elephants are able to recognize and differentiate the scent produced by their own kind versus other species.

One day, I was informed that an elephant calf had been killed by a lion. Upon reaching the site, I assessed that the carcass was about one week old but it was impossible to establish the means of kill since other carnivores had started feasting on the remains. The good news

was that the tusks were intact - a sign that poaching could easily be ruled out.

When I left the scene of the incident, the potent smell lingered with me. I drove back to the research centre after filling in my data forms and parked my car.

The following morning, I could still smell the strong odor coming from the car. After driving off to begin the day's monitoring, I encountered a family of elephants about five kilometers away from the research centre, and was surprised by their behavior. The family was initially skittish as I approached them but as soon as I turned off my car, they stopped and started sniffing and pointing their trunks in my direction. After identifying the family, I turned on my car and began to drive away. At that point, the family started trumpeting and running away in the opposite direction as if they were being chased. Despite being protected by the acacia thicket, they kept running away from the car until I could no longer see them, evidently disturbed by something. The second family I approached that morning displayed similar behavior. In normal circumstances, these two families tend to remain alert but don't run away trumpeting in alarm.



Elephants sniff the air to pick up the human scent of the monitoring team.

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In contrast, on a **live web-cam** operating within my study site, I recently observed how elephant families reacted to a hyena carcass that was lying on the riverbank. Two families came very close to the carcass before retreating slowly and avoiding it. A third family, stopped temporarily after noticing the carcass, then ignored it and proceeded to the river to drink water.

These observations suggest that elephants are able to detect and distinguish between their own scent and that produced by others.

Prior studies have revealed that African elephants have the largest number of genes related to smell of any mammal, and that they can distinguish the scents of two ethnic groups in Kenya: the Maasai and the Kamba. Studies also show that elephants pay homage to the bones of their dead, gently touching the skull with their trunk and feet. When an elephant walks past a place where a relative died, he/she will stop and pause. I speculate that the strong reactions from the two elephant families to my vehicle, versus the relative lack of reaction to the dead hyena, were because they recognized the smell lingering on the vehicle as that of a dead elephant – not just any smelly carcass. The smell, unassociated with a physical presence of an elephant carcass may have confused and frightened them. This is certainly something I will pay special attention to in the future! •



ELEPHANT PROFILE:



NAME: FRANZISKA

AGE: 45-55

IDENTIFYING FEATURES: A HIGHLY SER-RATED RIGHT EAR AND A DEEP NOTCH IN THE MIDDLE HELPS THE MONITORING TEAM IDENTIFY FRANZISKA.

CALVES: FRANZISKA HAS GIVEN BIRTH TO FOUR CALVES.

ABOUT THE FAMILY: FRANZISKA IS PART OF THE BF FAMILY, WHICH CURRENTLY HAS 24 INDIVIDUALS. SEVEN MEMBERS ARE ADULT FEMALES, AND THE REST ARE CALVES RANGING FROM 1-4 YEARS OLD. THE FAMILY ENJOYS WANDERING BETWEEN MOOLERA (A REGION IN CENTRAL MPALA JUST NORTH OF MUKENYA) AND NGARE-NAROK (THE CONFLUENCE OF THE EWASO NG'IRO AND EWASO NAROK). THEY ARE OFTEN SEEN ASSOCIATING WITH THE AP AND CE FAMILIES.

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Species interactions can shape the number and diversity of animals we find living together. Those interactions may be direct – such as when a lion eats a giraffe. Others may be indirect, where the participating species never meet. Indirect interactions often occur when several animal species share a common resource such as a food plant. Unfortunately, indirect effects are hard to measure, and their outcomes are not always straightforward. Plus, they can be influenced by external factors such as rainfall, temperature or soil quality. As a result, the effects of indirect interactions are poorly understood. My study aims to fill in some of the gaps in our understanding by examining the complex interactions among large herbivores, insects, and *Solanum campylacanthum* (Sodom apple) along a rainfall gradient.

The Sodom apple, a perennial shrub, is a common sight on Mpala. While their fruits are toxic to humans and livestock, Sodom apples are a preferred food of elephants and impalas. *Solanum* plants rarely reach large sizes or high densities in areas frequented by elephants and impalas. However, in areas where large browsers are excluded, such as inside the confines of the wire fence at the Mpala Research Centre, the plants grow



GEORGE WANG

A ladybug sits on a Solanum leaf.

tall and dense. Such shifts in the quantity and quality of *Solanum* can affect other organisms feeding on it, especially insects. Combined with the rainfall gradient across Mpala, the indirect effects of insects on *Solanum* get even more complicated to document.

In collaboration with Rob Pringle of Princeton University, I am using the Ungulate Herbivory Under Rainfall Uncertainty (UHURU) project's large mammal enclosures to examine the indirect effect of large mammalian herbivores on the insect assemblages found on *Solanum*. Established in 2008, the UHURU enclosures use semi-permeable electric fences to exclude mammals

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GEORGE WANG

Solanum is very common at the center -- this large patch is located just outside the dining area.

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of different sizes. The three size groups excluded by the treatments are: elephant (mega-herbivore), impala (meso-herbivore), and dik-dik (all-herbivore). These treatments are replicated at three sites along a 20 km north-south transect. The annual rainfall at the southern end of the transect is, on average, around 45% higher than rainfall at the northern end of the ranch.

The setup of the UHURU experiment allows us to tease apart how large mammals of differing sizes and rainfall affect insect communities. Rob's research team has already discovered that by excluding all sizes of mammals, *Solanum* grows bigger and more abundant, and excluding elephants and impalas increases fruit production. My goal is to find out whether these effects have positive or negative effects on insects. My field assistant, Fredrick Pento, and I have been collecting and identifying insects on *Solanum* in the UHURU enclosure plots since early June, as well as collecting and examining insect-damaged fruits.

So far, I have discovered that insect abundance increases with the exclusion of large mammals only where rainfall is the lowest. In addition, the number of insect species on *Solanum* increases with the exclusion of all mammalian herbivores but insect diversity appears to be affected by rainfall alone. The abundance of fruit-boring insects is higher where impalas are excluded, as they are one of the major consumers of *Solanum* fruits. My preliminary findings suggest that large mammalian herbivores and variation in rainfall have interacting effects on the insects feeding on *Solanum*. My information is useful in understanding the potential consequences of loss of wildlife - like elephants, giraffe and impala - on African savannas, as well as showing how climate change, with shifting precipitation levels, may affect how animals interact with one another. •



A stick insect (Phasmid) stands on a net covering a *Solanum* plant at the center. One component of this project involves covering *Solanum* plants with nets in order to see how they are affected by eliminating herbivory.

GEORGE WANG

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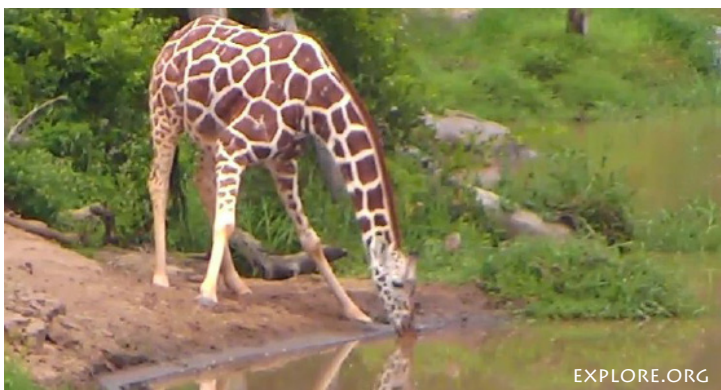
MPALA LIVE! LAUNCHES VALERIE MAY

Mpalalive.org launched June 22 -- just in time to be featured at the Smithsonian Folklife Festival-Kenya 2014. Hundreds of visitors watched the action at Mpala's Hippo Pool from an open tent pavilion on Washington D.C.'s Smithsonian Mall. The tent was equipped with a large, computer-connected monitor, which enabled visitors to see a live stream and videos captured from webcams positioned at the pool. Side-by-side with the Kenya Wildlife Service, we were part of the Living with Wildlife exhibit. Even in the 100°F-plus heat, folks crowded in to learn about our animals and talk with us about the project.

It was a great start for the launch of Mpala Live!. When the benches filled up with folks watching the live cams, I'd take the microphone and do a presentation about what they were seeing, answering questions and describing our project. The high level of engagement from people was very encouraging in terms of gauging the project's potential growth.

To date, we have had 25,000 visits to the website and over a million viewers of the live cams on explore.org (our sponsor). Our task now is to increase our audience. You can help by following us on Twitter @mpalalive, subscribing to our YouTube Channel at Mpala Live!, and liking our Facebook page at facebook.com/mpalaresearchcentre.

Like many of the projects at MRC, there are myriad moving pieces to this one.



In an image captured by an Mpala Live! visitor, a giraffe drinks from the hippo pools.



Seen on the Mpala Live! webcam, hippos open wide for the camera.

To recap the highlights since I wrote about the project for the **October 2013** issue of Mpala Memos:

- In January, we installed the cameras and network, including wi-fi and computers for the Mpala primary school. The live cam installation includes five solar-powered cameras that stream to a hub at the GIS lab where computer stations allow three cam operators to remotely zoom in on the action at the river. It was a weeks-long effort that included pouring concrete, solar panel and battery installations, hundred of feet of wire strung at the school, many custom-made steel widgets, bolts, etc. that were engineered in the workshop. The core team worked with Mpala's school teachers, maintenance crew, security, and day laborers. And all of this was coordinated with researchers working in the hippo pool area—it was truly an Mpala-wide effort.

- A dedicated 10 MB line carries the data stream from MRC to the world. This isn't always smooth, but we're working through connectivity challenges. Generally, we are broadcasting live during daylight hours and show highlights on off hours. We have an infrared camera for

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MPALA LIVE! LAUNCHES

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night viewing but the technology isn't up to speed yet for a quality user experience. We hope to improve the IR feature in the coming year.

- Our sponsor and partner, Explore.org/Annenberg Foundation, started broadcasting the **stream** in the spring. Visitors to Exlore.org can take pictures of whatever the cam is viewing in real time. The accompanying images were taken by our Web audience.

- In April the Mpala Live! video crew was on site for two weeks shooting footage for a video series called "Stories from the Bush." These feature researchers and their work, like Sandy Odour in **Elephant Crossroads**.

- Other features of the website include **live streaming webcams**, an **interactive field guide** on 88 species featuring original drawings and watercolors by local artist and naturalist Lavinia Grant, **Stories from the Bush**, and a **Classroom** section with downloadable lesson plans, classroom activities, and worksheets for both the US and Kenya. The US plans conform to the national standards (CCSS, National Geography Standards, and NGSS).

- In August we started a series of live chats with Mpala researchers and visitors. Elephant expert Simon Hedges was **broadcast** live from Executive Director Margaret Kinnaird's back porch. We followed that successful broadcast in September with **hippo researchers Doug McCauley and Francis Joyce**, and Dan Rubenstein is doing a live chat about zebras this month.

- This past summer, a team of alumni and students from Princeton University's Teacher Prep Program were onsite to develop additional educational materials for the Classroom section. We plan on having the materials formatted and online in December. Many thanks to Nancy and Dan Rubenstein for making the program a reality. I'd like to share this email from one of the pro-

gram participants. It illustrates exactly what we hope to achieve with this project.

"I have been back to work for the past two weeks teaching 8th grade science in New Jersey. Our first unit is "How to Think Like a Scientist," which includes using observations to make inferences, differentiating between quantitative and qualitative observations, and the scientific method. I wanted to let you know that I have been using the Mpala Live! website extensively and the students love it..."

Julianne Davis

- Coming up soon... We are working with **zooniverse.org** to develop the Citizen Science section. We'll also be creating an interactive map, building out the Field Guide with more birds and sections on insects and flora, and putting a hydrophone in at the pool so viewers can hear the hippos underwater.

Thank you to the many individuals that have made this project a reality. Please send questions, thoughts, and comments to mpalalive@mpala.org.



An Egyptian goose shows off its wings beside the hippo pools.

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MPALA AT A GLANCE

- From August 25-28, 22 visitors from countries including Kenya, China, and the United States, descended upon the research centre and river camp for an ecohydrology conference organized by Lyndon Estes, of Princeton. The group discussed food security issues in the wake of a changing climate.



- **Left:** 17 Spanish students from the Institute of Tropical Biology came to Mpala for a week in the beginning of September as part of a field biology course. While here they also visited the nearby Ol Pejeta Conservancy.

- **Right:** On September 18, Stef Strebel and Helen O'Neill gave a talk at Daraja Academy as part of the Women in Conservation Lecture Series. Stef and Helen, who are part of the Kenya Rangelands Wild Dog and Cheetah Project, taught the girls at Daraja about conservation of African wild dogs and cheetahs, and discussed their own career paths in the field of conservation. Following the lecture, a performance by the Segera Theatre Outreach Group elicited fits of laughter from the girls.

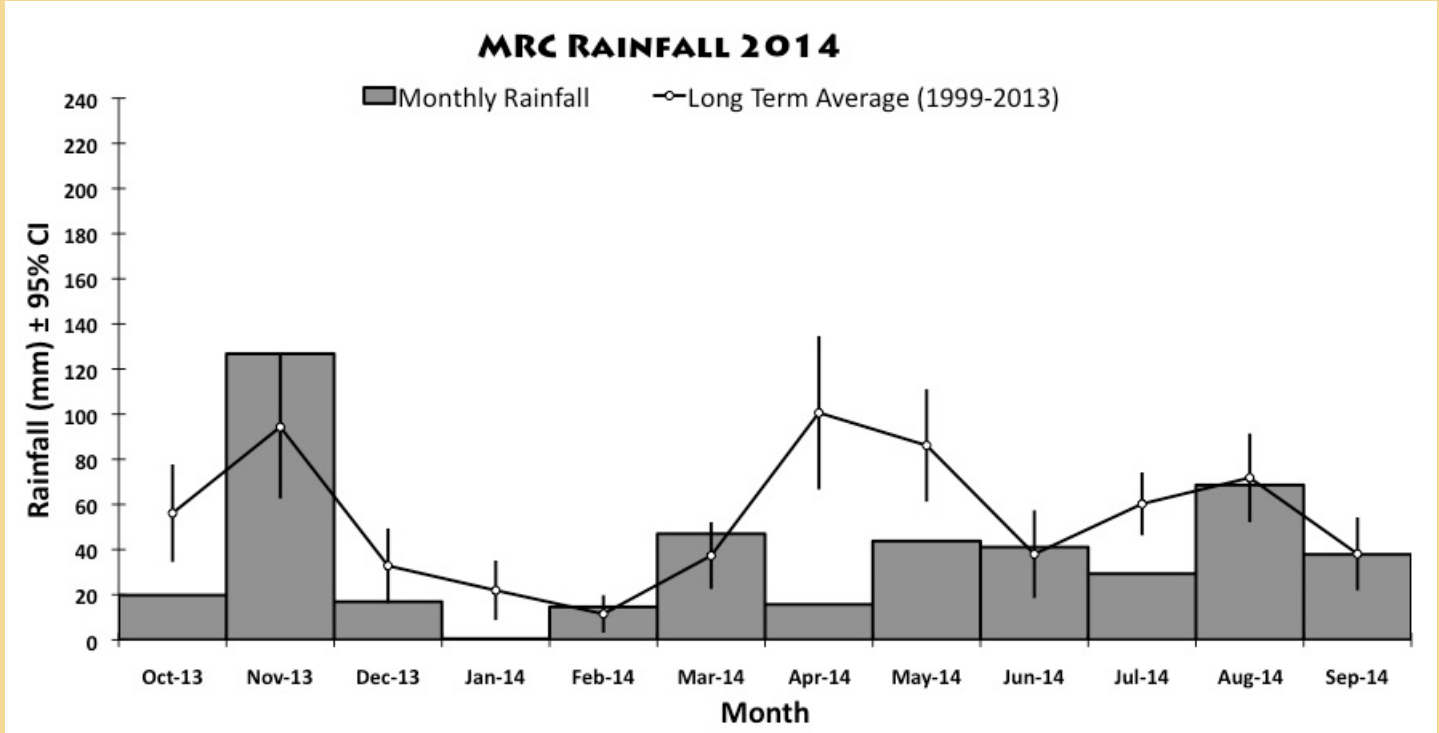


- **Left:** From October 12-13, nine journalists from Nairobi covering The Standard, People Daily, and Science Development, and several freelancers stayed at Mpala to get a sense of the research centre's activities and role in regional conservation. They spoke to researchers and visited the Mpala primary school to learn about their use of the Mpala Live! website in promoting conservation education locally, regionally, and globally.



- **Above right:** On October 16 and 17, student groups from Junior Scholars Academy in Nanyuki came to Mpala to learn about conservation with Northern Kenya Conservation Club coordinator Wilson Nderitu. The students saw a number of endangered animals including Grevy's zebras, elephants, and hartebeests.

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