

MPALA MEMOS

NEWS FROM MPALA

TOP STORY

ECOHYDROLOGY, ALSO KNOWN AS GROWING GRASS

Keir Soderberg, Stephen Good, Kaiyu Guan and Lizzie King

It hadn't rained for six weeks, with no significant rain for twelve. All of the grass was brown. The soils were baked dry. So, we decided this would be the perfect time to study the intricate relationship between green grass and water (i.e., to watch the grass grow and die). In particular, we wanted to test some novel techniques for measuring water use and stress in plants. With tremendous help from Mpala ranch, we watered a 13m radius patch of grass near the Mpala ranch house for three days in early February, adding a water volume equivalent to a 10mm rain event each day. The first green leaves appeared during the third day of watering, and two days later, we had a bright green patch to work with.



Ekomwa Akuwam sampling soil water vapor for isotope analysis. Photo by Keir Soderberg.

Nature then apparently became inspired by our watering efforts, and contributed another 8mm rainfall on day seven. Over the next week, the grass predictably suffered

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ANIMAL SPOTLIGHT

LION CONSERVATION: LESSONS FROM LAIKIPIA THE LAIKIPIA PREDATOR PROJECT

Laurence Frank

The Laikipia Predator Project began on Mpala in 1997, with the aim of improving



A Laikipia lioness. Photo by James Warwick.

conservation of large carnivores in Laikipia. Large predators are the most difficult mammals to conserve in human-dominated landscapes: domestic livestock are easy prey compared to wild grazers, and their owners kill predators in retaliation. Over the last 14 years working with local land managers, I have seen both the positive will to conserve Laikipia's predators – and the huge amount of work still to be done before their future is secure. Based on our experiences in Laikipia, we spun off sister projects in the Amboseli and Mara regions of Kenya's Maasailand and created the umbrella organization,

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A, B, C AND 1, 2, 3

Theresa Laverty

No one ever forgets his or her school days. In school, you read your first books, write papers, add and subtract, and gain a broader world perspective. Behind all that teaching are people whom you seldom see outside of the classroom, but they remain forever embedded in your childhood memories.

At the Mpala Primary School, things are not much different. Five teachers oversee the first five years of education along with a nursery school teacher. The place is never quiet with over seventy students bustling about.

In 1988, the Mpala Primary School began with a single nursery class. First grade was added in 1997, followed by second grade in 2001, third grade in 2004, and fourth and fifth grade together in 2007. Today, three buildings house the various student classes. After fifth grade, students continue their primary and secondary educations at neighboring schools.

According to the teachers, the Mpala Primary School is unique in many ways. In particular, the school is close to wildlife and the teaching staff has a lot of interaction with the pupils' parents. Another special thing at the Mpala Primary is a set of TeacherMates, or small handheld computers for use in the classroom. Donated by Innovations for Learning last year, the students have become accustomed to playing the math and reading games designed to sharpen their skills with numbers and familiarize them with English reading and speaking. The Mpala Primary School is the first school in all of Kenya to use these little computers in the classroom. Students also interact with native English



The Mpala Primary School teachers: Joyce Watetu, Pauline Njoki, John Kibet, Lilian Yator, Herzon Gikwa, and John Maina.

Photo by Theresa Laverty.

speakers at the research centre, are penpals with students from Denver, Colorado, take trips to museums and to the Ol Jogi Pyramid "zoo," and have the opportunity to watch the occasional English film, like *The Lion King*.

English is one of the subjects Lilian Yator, the second grade teacher, gives special attention to. She helps her students overcome the obstacles by translating the material into KiSwahili from time to time and helping them with English words that they would encounter on a day-to-day basis, making them easier to understand. Hezron Gikwa, the fourth grade teacher, finds social studies to be a difficult subject to teach. He solves this problem by teaching a longer unit than the standard curriculum and he involves the pupils when teaching about different cultures and ethnic groups, particularly those found within Kenya.

When asked what is the one thing in the world they wish to teach their students, the teachers gave different answers. John Kibet, the first grade teacher, answered, "About diseases like AIDS," while Lilian and

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TRACTORS AND DUNG: RESTORING RANGELANDS

David Kimiti and Morgan Pecora-Saipe

We at the Rangeland Health project, working under Corinna Riginos and alongside Mike Littlewood are currently undertaking a restoration experiment using Mpala's movable, metal cattle bomas, or corrals. Other Mpala researchers have shown that cattle bomas stimulate grass to grow in areas that used to be bare ground. This not only attracts wildlife but also helps stop erosion and provides more grass for cattle in years to come. But bomas are not the only way to restore grass to bare areas. Another approach is to use a tractor to 'rip' or furrow the top layer of soil, breaking up the hard surface and encouraging seedlings to grow.



Morgan, Jackson Ekadeli, and Wilson Longor take measurements at a new boma site.

With our experiment we are asking whether cattle bomas combined with tractor ripping at different times can be even more effective in stimulating grass to establish. We are testing four scenarios: Cattle boma only; tractor ripping after the cattle boma is moved off the site; tractor ripping before the cattle boma is placed on the site; and tractor ripping only. These combinations are compared to a control area where we do no manipulations. In each of these five treatments, we are also collecting soil and dung samples to find out what seeds are stored in the soil and whether the cattle



A mobile cattle boma.

are bringing in more seeds. In the long run, we also aim to find out how these different treatments increase the soil's ability to store and sequester carbon. Finally, to understand how attractive the various sites are to wildlife, we are setting up automated cameras that photographically 'trap' visiting animals.

Our experiment was designed in collaboration with ranch manager Mike Littlewood, who is keen to hear about the results and hopefully use them to inform his ranch restoration efforts. Mike believes that the 'boma after ripping' site will have the best results, while his herders think the 'ripping after boma' site will be the best. We will keep you updated on the developments! ■



Tractor ripping before the cattle boma is placed on site. All photos by David Kimiti.

FRIENDS OF MPALA

I am delighted to announce that the annual Mpala Fundraising drive reached its \$100,000 goal. I deeply appreciate the support we receive each year from our friends. Without the generosity of our past and present supporters, Mpala would not be what it is today. I am pleased to recognize below those who have demonstrated their commitment to our mission through gifts large and small.

The Ndovu Society honors loyal donors who have contributed annually to our fundraising campaign since its inception in 2007/2008. Ndovu, Swahili for elephants, are known for their stamina, dedication and leadership so they are an appropriate symbol for those individuals who help sustain our long-term activities.

I also thank those who have contributed over the past two years (**) and give a very hearty welcome to our newest friends who joined our fund raising drive this year (*).

- Margaret Kinnaird, ED

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LITTLE KIDS IN THE BIG CITY

Theresa Laverty

At the end of January, 23 Mpala Primary School students and five teachers ventured forth from the tranquility of Mpala to the hustle and bustle of Nairobi. The third, fourth, and fifth graders spent two nights at the Wildlife Clubs of Kenya dormitories and visited the National Museums of Kenya and Uhuru Gardens. For many of the students, this was their first trip to Nairobi, their first experience in traffic, their first time seeing large airplanes, and their first time in the shadows of Nairobi's City Centre skyscrapers. All of these things can be overwhelming for newcomers in Kenya's capital city. The students, however, absorbed a lot of information from their stay, particularly focusing on their visit to the museums, unanimously voted to be the favorite part of their trip.

Most memorable in the museums were the animals, birds, and human origin rooms. The students got to inspect up close a buffalo, a hippopotamus, monkeys, an elephant, fish, and many different birds. A teacher reported that the other school groups at the museum on the same day had no idea what the animals were, but the Mpala students proudly proclaimed that these animals live with them back at Mpala, while rattling off



The hippopotamus exhibit.

Photo by John Maina.

their names. The anthropology section of the museum includes the nearly complete skeleton of the 'Turkana boy,' dated to have lived around 1.5 million years ago. All of the students enjoyed this part of the human origin section, but it was especially meaningful to those whose families come from the Turkana region. Other displays included the traditional pots, baskets, gourds, and stone and bone tools. One of the most unforgettable displays according to the students was that of a man clothed in animal skins using a stone tool to slaughter a gazelle.

Nairobi was both "beautiful and different" for the students and all of them hope to return again in the near future. ■



The Mpala students in front of the National Museums of Kenya.

Photo by John Maina.

MPALA MEMORIES, PART VIII:

JOHN LEMBOI

*The first seven installments of this series were all from the point of view of a single researcher. Of course, others were an integral part of the history of Mpala Research Centre, right from the beginning. In the next installments of Mpala Memories, we will hear from some of these people. The first is research assistant **John Lemboi**, in his own words. I have made only minor typographical edits, and extra bits of information are in brackets. - Truman Young*

John Lemboi

When I came to work at Mpala in 1995 nothing much did I know about MRC. Mpala Research Centre had just started to be operational. Neil Lindsay had just started his work as manager at the centre. John W. Smith was on the ranch having been there for quite long time [~10 years] as ranch manager.

I was not new to Mpala, because I had been visiting some friends. I had already known George Small and John. I had come to visit my friend Lokinyanyi who was working at the MRC as a guard, and started liking the place. There were just few newly hired staff at the centre and Lokinyanyi was one of them. Neil was staying at the centre with his wife (I wish I could remember her name). They had only quite an old land rover, maybe a 1970s model short chassis. Since Lokinyanyi was Neil's guard and he was the only staff who was staying at the MRC (then it was mostly known as Mpala Foundation), I personally became close to Neil and his wife as a friend and a close companion. One reason is because my friend was not able to communicate with mostly Neil's wife who also did not speak Swahili and now I had become a translator.

Neil had already talked with John Wreford on hiring me initially as head of security, but later hired Nick Tomlinson in that position, instead I got a job to help Neil and wife on some other tasks.

On the beginning of September 1995, the Mpala Research Centre was opened for operation including the dining hall, the kitchen, and the office. Dr. Truman Young, Lynne Isbell and their crew from the river camp were the first of Mpala research



John Lemboi working in the field. Photo by Maureen Stanton.

centre occupants. They brought Julius and Sumat now both are the senior security officers. The staff bandas were being built, and there were only maybe four available for staff to take up housing, so still most of staff were located at the Mpala [Manager's] house village where housing was available. The new management hurriedly built more staff bandas and management houses with the anticipation for the new beginning of a new regional or world class research centre.

My first research work was to help Bell Okello as field assistance, who was also Dr. Truman's student, although I had previously

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MPALA-AT-A-GLANCE

Courses & Student Groups

- Nine Princeton University undergraduates studied at Mpala over the past three months. They took four courses covering topics such as rangeland ecology, animal behavior, alternative energy, and ecohydrology.
- In March, 38 McGill University students spent just under a week at Mpala during their semester abroad that travels across Uganda, Kenya, and Tanzania. A team of professors covered projects looking at the causes of damage to Acacia trees and the production of stone tools, among other topics.
- In April, 12 University of Leeds Masters students took a two week course at Mpala, studying acacia-ant interactions, the amount of elephant damage to trees, and ungulate distribution across a range of habitats.

Welcomes

Mpala welcomes Michael Stastny, a postdoctoral research fellow from the University of Florida. Michael works under Todd Palmer, investigating the role of ants in the growth of whistling thorn acacias.

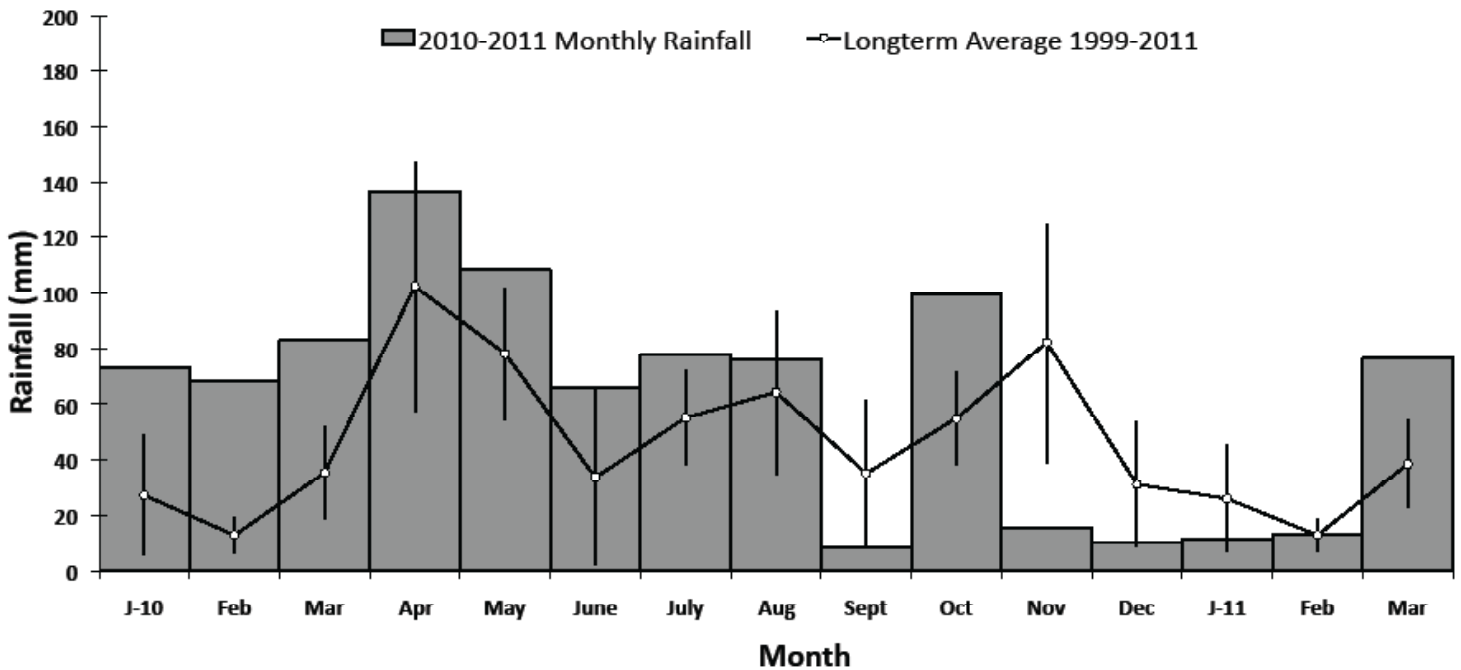
We also welcome Cynthia Gerlein, an environmental engineering Masters student from the University of Strasbourg in France. She is mapping soil moisture using geophysical methods with the help of Kelly Caylor of Princeton University.

Events

Mpala congratulates two of their longterm researchers on the arrival of their baby boys. Welcome Rohan Sundaresan and Kitto Woodroffe-Hedges! ■

MPALA WEATHER CORNER

MRC RAINFALL 2010 - 2011



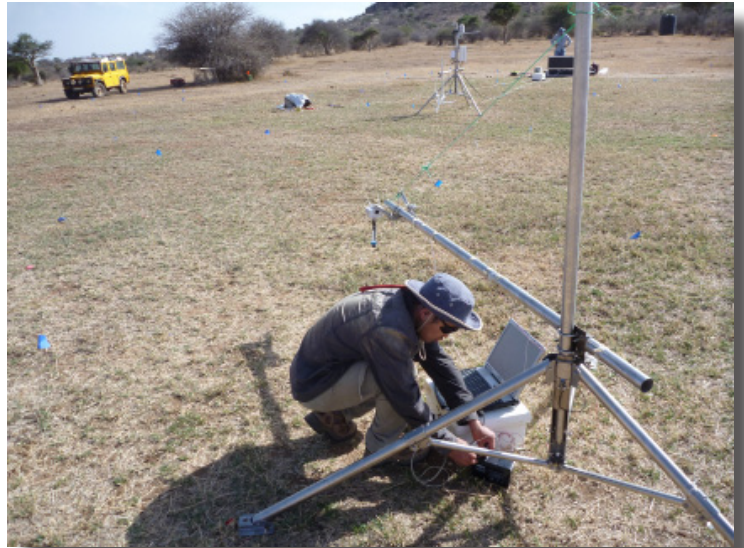
ECOHYDROLOGY, ALSO KNOWN AS GROWING GRASS

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from the drying soil and returned to its original dry, dormant state.

The research questions we were evaluating during this experiment were: (1) Can stable isotopes of water be used to distinguish between transpiration from plants and evaporation from soil and (2) Is chlorophyll-a fluorescence (this is a property of the light reflected off of green leaves; chlorophyll is a chemical compound necessary for photosynthesis) a more sensitive measure of photosynthetic efficiency and water stress than more traditional methods? In order to evaluate (1), we used the same instruments that we have on the 24m flux tower on the north side of Mpala, but instead placed them just 40cm above the ground. For (2), we used a hyperspectral spectrometer about 1m above the ground to gather the data that is normally collected from satellites.

All of this work is aiming towards understanding how plants deal with drought. In fact, it's not just individual plants that we're interested in, but the collection of plants, animals, microorganisms, and physical factors that make up an ecosystem. The most fascinating part of ecosystem



*Kaiyu, Ekomwa, and Keir in action.
Photo by Stephen Good.*

science is figuring out how these various components interact to supply the ecosystem services on which we depend. The initial results of the experiment are promising, and if our techniques work, we will for the first time be able to directly measure landscape-scale water use efficiency and water stress in plants. This information will, in turn, allow us to evaluate how different rangeland management scenarios affect the resilience of vegetation to changes in water availability. Look for some exciting results in the next few months! ■

STAFF PROFILE

A,B,C AND 1,2,3

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Hezron answered, "About the environment." Pauline Njoki, the fifth grade teacher, wishes to impress upon her students the negative consequences of drug abuse. Meanwhile, John Maina, Mpala's Head Teacher and third grade instructor, wants to teach his students more about economics. With this diverse set of perspectives and priorities, the Mpala students must greatly benefit from the help of their teachers.

All of the teachers aspire to have a library set up for the students and perhaps more outdoor equipment for Joyce Watetu, the nursery school teacher. Science instruments would also contribute to their lesson plans. With over seventy students, the Mpala teachers have a challenging, but rewarding job. They anxiously await the first Mpala graduate to become a doctor or government official – and I would not put that difficult feat past them. ■

LION CONSERVATION: LESSONS FROM LAIKIPIA

THE LAIKIPIA PREDATOR PROJECT

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Living with Lions, which now employs eight biologists, one social scientist, and 35 Lion Guardians (Maasai warriors).

Most Laikipia ranchers are extraordinary conservationists. This is the only place in the world where most ranchers go to considerable expense to protect their livestock from predators, still tolerating the loss of the occasional cow in order to maintain populations of lions, hyenas and wild

dogs. They use traditional African livestock practices that evolved to protect cattle from carnivores and stock-raiding humans, while experimenting with modern modifications. An extremely successful recent innovation was Giles Prettejohn's development on Ol Pejeta Ranch of movable, metal bomas, which provide virtually 100% protection against carnivores and have also proven to be highly effective tools for restoring degraded rangelands. Compare this remarkably progressive attitude to ranchers in the western United States who eradicated wolves, grizzlies and cougars a century ago and where many pickup trucks still carry a rifle in case there is an opportunity to shoot a coyote or bobcat.

Unfortunately, that attitude does not typify all of Laikipia's land managers. Much of our early effort in the region focused on Mpala Ranch, where we radio-collared 23 lions between 1998 and 2007. However, lions move widely over different ranches and it gradually became clear that Mpala's neighborhood is a tough place for both lions



Alayne Cotterill collaring a lion on Mugie Ranch.

Photo by Laurence Frank.

and lion researchers: contrary to the situation in other parts of Laikipia, a few of Mpala's neighbors did not appreciate lions on their property and eliminated our study animals. Even now this continues; two fine male lions have been shot adjacent to Mpala's boundaries since the beginning of this year. Elsewhere in Laikipia, people inform us on the rare occasions when they need to shoot a chronic problem lion, but Mpala lions simply disappear. Unfortunately,

in many cases the collars of eliminated lions were destroyed. When an entire well-known pride that had never caused problems for Mpala or its neighbors was eliminated, we made the difficult decision to invest our limited resources in northern and eastern Laikipia, where more property owners value predators and work to protect them.

The good news is that there is a recent rising concern among central Laikipia land owners about the fate of Laikipia's lions. As Mpala's neighbors join the greater Laikipia community in becoming more transparent about their lion problems, we can focus on how to reduce lion depredations and work towards exchanging bullets for predator-proof bomas. With a unified approach and thoughtful lion control, the commanding beast that tops the 'Big Five' and attracts a large tourist base will find much needed shelter in central Laikipia. When this happens, Living with Lions will re-invest in those elusive lions that roam across Mpala. ■

MPALA MEMORIES, PART VIII: JOHN LEMBOI

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assisted small student groups visiting Mpala. Later on I joined Professor Maureen, Todd and Truman for all these (12) years. Thanks for their good attitude and support.

George Small was coming to Mpala from the US almost twice a year, and he was very happy with the great work that John W. Smith was doing. The staff and the community around Mpala were and are still fond of George and Mr. John, some of whom have known them since childhood. John Wreford Smith knew how to cope with Kenyans' lifestyle.

When George was still alive he used to invite the moranis (warriors) of Lewaso (the Maasai community neighbouring Mpala on the eastside) to come and do a tradition dances for his guests. And you could see these



A 1998 UC Davis field team photo. Left to right: Maureen Stanton and Amanda Evans kneeling, and John Lemboi, Todd Palmer, Lizzie King, and Truman Young standing. Photo courtesy of Truman Young.

moranis riding with George in his land rover, even some employed as cattle herders. There was hope or sign on every staff that the centre will bring out great opportunities. ■

MPALA WILDLIFE FOUNDATION & MPALA RESEARCH TRUST

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George Small (1921-2002)

Mpala Conservancy Manager:

Michael Littlewood

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