

MEP April 2022 Report



The new collar display on MEP's campus highlighting the evolution of elephant collars over the last decade.

GENERAL

Drones are a low-cost solution to mitigate conflict and to conduct aerial reconnaissance and field research in the Maasai Mara. In late March, a drone training lead by Expert Drones East Africa took place on MEP's campus covering a range of topics to understand how to safely and effectively operate drones in the field. We're happy to say that MEP rangers and staff successfully graduated from the program and have received their remote pilots' licenses.



Some of the MEP graduates from the drone training program.

SECURITY, ANTI-POACHING & CONFLICT



On April 14, the Tanzania National Parks Authority (TANAPA) arrested one suspect in possession of 34.46 kg of ivory (4 tusk pieces) based on Mara Elephant Project intelligence.

The MEP “Bravo” ranger unit patrolling the Loita Forest alongside partner South Rift Association of Land Owners (SORALO). Over a two-day period in April the team started a foot patrol on the east side of the forest and moved west, stopping in the middle of the forest to make a fly camp and spend the night. Their patrol covered 47 km (29 miles) and ended at their base camp.



Overall, in April, MEP rangers alongside government partners recovered 207 posts, one tree cut down, destroyed 12 kilns and three sacks, arrested four habitat destruction suspects, removed three snares and mitigated three conflict incidents.

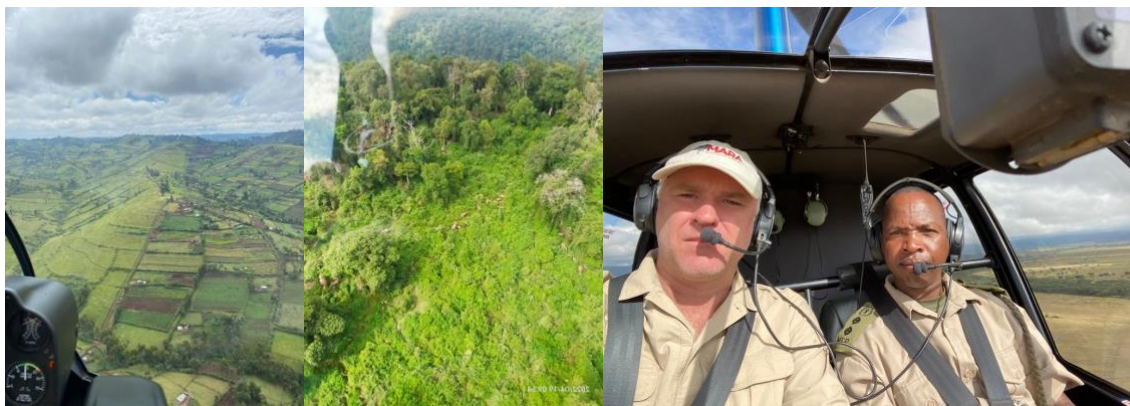


MEP’s “Foxtrot” ranger team responding to elephants in a fence in the Nyakweri Forest area.

In April, MEP rangers patrolled a distance of 1,172 km on foot, 10,936 km by car and 2,966, km on motorbike in the GME. MES rangers in Shimba Hills covered a distance of 50.9 km on foot.

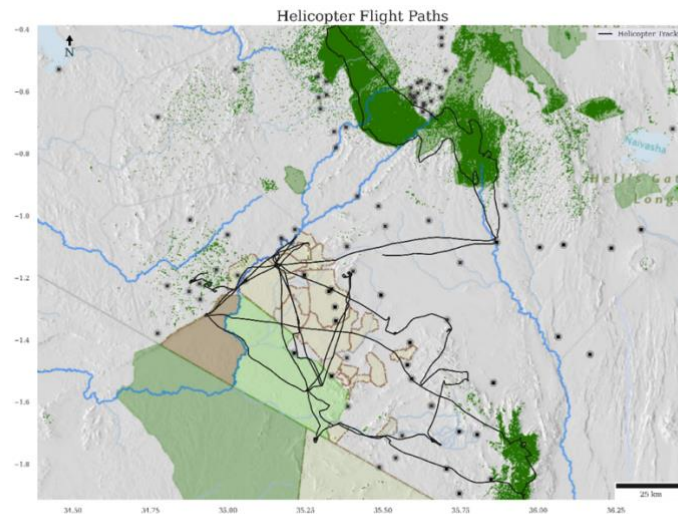
HELICOPTER

On April 19, MEP CEO Marc Goss and Senior Warden Zakayo Lenaeku conducted an aerial patrol of the Mau Forest alongside government partner Kenya Forest Service. The aerial reconnaissance patrol allowed Marc and Zakayo to note locations of illegal logging and charcoal making sites and relay them to the MEP/Sheldrick Wildlife Trust (SWT) Mau De-Snaring Unit stationed on the ground. During the patrol, elephants were spotted inside the forest (like finding a needle in a haystack) and the team monitored the progress of the reclaimed areas of the forest. From the air, they determined less forest destruction in the reclaimed areas and these areas were showing healthy rejuvenation.



Kenya Wildlife Service (KWS), Wildlife Research and Training Institute (WRTI) and Mara Elephant Project re-collared Matali on April 22 not far from MEP's headquarters. Matali is a bull elephant that was originally collared in May 2020 after being translocated by KWS from Kajiado County, not far from Nairobi. He is an important elephant to re-collar because his movements allow MEP rangers to react to conflict quickly and effectively in an area with growing infrastructure development. Additionally, his movements help KWS, WRTI and MEP better understand the connectivity from the Rift Valley and Mosiro into the Maasai Mara. MEP's Senior Warden Zakayo was out in the field monitoring Matali with his herd of 10 before the planned collaring operation. The helicopter piloted by CEO Marc Goss was used to assist the collaring operation and KWS Vet Ephanthus Ndambiri assisted by WRTI Wildlife Ecologists Stephen Ndambuki alongside MEP's long-term monitoring (LTM) team made a successful collaring operation.





COMMUNICATIONS & FUNDRAISING

Mara Elephant Project was featured on an April episode of Wildlife Warriors, which aired in Kenya. Thank you to Wildlife Direct and Paula Kahumbu for visiting MEP and featuring our work. We celebrated Earth Day on April 22 by highlighting the training and recruitment of new and existing MEP staff tasked with protecting the planet's wildlife and wild spaces. A portion of the drone training was supported by our long-time partner Elephant Cooperation. Thank you to all of the photographers who supported MEP with their April entries in the Greatest Maasai Mara photo competition sponsored by Angama Foundation.



An April entry from Subi Sridharan.

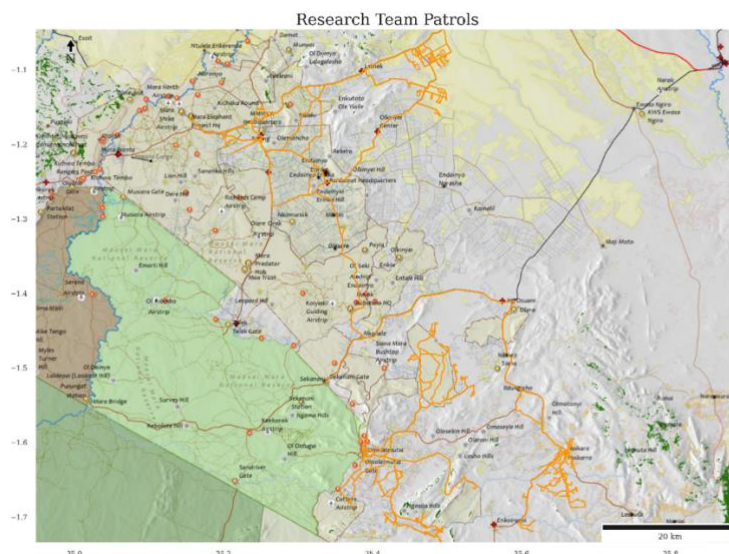
In April, the Sidekick Foundation, Inc. dba Mara Elephant Project USA received \$209,747.84 in donations. Thank you to our loyal supporter Lori Price who is continuing with her support for the two Loita Forest ranger teams with an \$81,000 grant in 2022. We are also extremely grateful for gifts from Nancy Meyer, the Sundman Family Fund, Peter Stewart, Peggy Nelson, Joan Ballitch, James Schnapp, Leann Hennig, Heidi Nitze, Beverly Hitt, Theodore Peyton, Therese Angrees, Phillip Bagato, Shandra Belknap, Feliste Ellis, John Gorans, Michele Hagans, Deborah Hutto, Ronald Jacquart, J Martin, Rebecca Suttie, The Drang Gallery, Jean Nunes, Delores Phillips, Elizabeth Cooper and The Alaska Community Foundation.

RESEARCH & CONSERVATION

Director's Update

Mara Elephant Project had the pleasure of hosting our key partner WRTI for a visit at our headquarters. MEP will be supporting WRTI's efforts to setup EarthRanger as their data platform. Catherine Villeneuve arrived in late April. She is doing an MSc at University of Laval in Quebec and is helping MEP to develop machine learning approaches for the analysis of movement data. She will also be contributing to MEP's Ecoscope project, and her time at MEP is supported by AI2. Our team made significant progress in extending Ecoscope and we now have a rich set of movement and environmental analysis tools to generate conservation and research outputs with. In April, I also joined in for the EDEA drone training and received my drone operator's license.

Year	Month	Electric	Other	Wire	De-fenced	Total (kms)
2019	November	48.27	-	18.35		66.62
2019	December	81	-	59		140
2020	January	111.16	4.64	124.71		240.51
2020	February	101.62	1.17	33.99		136.78
2020	March	48.59	0.14	59.76		108.49
2020	April	19.78	0	10.38		30.16
2020	May	24.75	1.88	41.18		67.81
2020	June	15.19	1.48	107.88		124.55
2020	July	37	-	52.76		89.76
2020	August	60.12	7.52	40.08		107.72
2020	September	126.95	7.15	221.44	15.18	370.72
2020	October	109.05	10.57	218.99	1.78	340.39
2020	November	101.2	24.52	153.12	13.88	292.72
2020	December	62.99	9	190		261.99
2021	January	87.9	19.4	121.09	5.2	233.59
2021	February	79.2	22.9	175	-	277.1
2021	March	20.3	7.4	147.92	8.6	184.22
2021	April	80.2	31.05	96.4	2.3	209.95
2021	May	40.3	23.6	296.5		360.4
2021	June	37	44.8	214.2	2.7	298.7
2021	July	21	33.6	138	63.6	256.2
2021	August	14.03	48.7	159.8	0.44	222.9
2021	September	19.2	34.8	218.1	0.1	272.2
2021	October	21.7	17.9	109.5		149.1
2021	November	5.6	7.9	169.9		183.4
2021	December	-	0.6	86.4	-	87
2022	January	13.3	28.9	182.6		224.8
2022	February	1.8	24.5	54		80.3
2022	March		43.3	168.7		212
2022	April	7.3	21.5	133.6		162.3
	Total (kms)	1,396.2	478.9	3,803.80	113.78	5,792.3



Movements (orange tracks) of MEP's three field assistants during April. All of our field assistants are working on mapping fences, roads and landcover ground-truthing points using motorbikes and our terrachart app. They recorded 162.4 km of fences and 46 LCC points in April.

MEP Experimental Farm

General

The exciting news this month is that we had several elephant visits; it is the first time we had elephants visiting the farm consecutively for a week. Elephants visiting the farm gives us a more interesting view of the research and helps us understand the dynamics even more. We also added two more workers, a cook and a farm worker, helping the team with organic farming and good crop management practices.

Over the last month, we had requested heirloom seeds to be added to our farm, and this month we received over 20 different seeds which we will propagate and raise seeds of our own that can easily be replanted in the farm. Gooseberries, which are a wild fruit in these parts of the Mara, has had high yields previously, but the vervet monkeys have been predated on them and we had almost zero we were able to harvest in the previous months. This time around, we were lucky to harvest a few kilograms. We spent an afternoon learning value addition with all of the farm workers to make marmalade from the gooseberries. Once we add more capacity, we plan to conduct a market study on the various products that can come from gooseberries and how marketable it can be in Kenya.



Figure 1: Farm workers learning to make Marmalade from gooseberries harvested from the farm.

Experimental Farm Sit Rep

Date Time	Plot Id	Type of Crop	Details
2022_04_03	11-1.1	Maize	A hippo ate part of the maize crop, leaving the rest intact
2022_04_03	S2-1-1.1	Maize/hives	Hippo predated on maize as it roams and left footprints on the plot
2022_04_03	10-1.1	Lemon Grass	Hippo ate three crops which were previously eaten on the tips
2022_04_03	6-2.1	Maize	The edges of the rows of the maize crop were eaten by hippo
2022_04_03	5-1.1	Sweet Potato	a few pieces of the vines on this plot were eaten by hippo
2022_04_03	9-4.1	Sukuma	A total of 5kgs was harvested and taken to HQ
2022_04_03	9-11.1	Spinach	A total of 5kgs was harvested and taken to HQ
2022_04_06	5-5.1	Goose Berry	6kgs of gooseberries were harvested which were used to prepare marmalade
2022_04_06	2-5.1	Carrot	14.5kgs of carrots of medium six were harvested
2022_04_08	11-1.1	Maize	Elephant eat a few maize crops which were taller than the other
2022_04_08	6-2.1	Maize	Elephant predated on maize crops about biting a few crops, damage not visible
2022_04_08	7-4.1	Capsicum	Footprints of the baby elephant seen, two pieces of capsicum at the edge of the plot have been eaten
2022_04_08	9-4.1	Sukuma	One Sukuma was bitten by elephants and leaves were not eaten, but left on the ground
2022_04_11	11-1.1	Maize	Elephant eat remaining maize leaving very few
2022_04_11	11-3.1	Peas	The five Peas Plots yielded a total of 11.5kgs of peas, the following day all were replanted
	9-10.1		
	5-2.1		
	4-6.1		
	1-9.1		
2022_04_11	3-9.1	Beans	The total beans harvested in the four plot was 8kgs of dried yellow beans, they were all replanted the next day
	4-7.1		
	6-13.1		
	10-6.1		
2022_04_11	7-3.1	Chili	Three plots yielded 12kgs of chili
	10-11.1		
	8-7.1		
2022_04_12	5-14.1	Capsicum	A total of 12kgs was harvested
2022_04_12	11-1.1	Maize	The crop was replanted after it was eaten by hippos and elephant
2022_04_12	2-5.1	Carrot	Replanted for the third time after harvesting
2022_04_12	5-3.1	Carrot	Replanted for the third time after harvesting
2022_04_12	1-2.1	Lemon Grass	Hippo ate one piece of lemon grass and stepped on the plot

2022_04_12	6-2.1	Maize	Two hippos eat a few maize crop
2022_04_12	9-1.1	Butternut	hippos stepped on butternut plot and uprooted a few
2022_04_12	11-1.1	Maize	Hippo fed on all the remaining maize in the plot
2022_04_12	S2-1-3.1	Maize/Sunflower/Cover crop	Footsteps visible inside plot, zero predation
2022_04_12	9-6.1	Potatoes	Hippo ate leaves of one crop of the Irish potatoes
2022_04_13	1-2.1	Lemon Grass	One has been uprooted and three eaten by the tips by one hippo
2022_04_13	2-13.1	Rosemary	One crop has fully been uprooted and not eaten by hippo
2022_04_13	8-5.1	Maize	A few maize crops have been uprooted and eaten by hippo
2022_04_13	10-1.1	Lemon Grass	4 pieces have been eaten on the tips by hippo
2022_04_13	10-10.1	Wheat	At the edge of two rows a few pieces have been eaten by hippo
2022_04_14	1-4.1	Sweet Potato	Hippo has eaten the edge of three rows in the same plot
2022_04_14	6-2.1	Maize	Uprooted three maize crop and eaten
2022_04_14	8-1.1	Onion	A total of 35kgs of bulb onion were harvested in the three plots
	8-8.1		
	10-4.1		
2022_04_15	1-4.1	Sweet Potato	After frequent predation, the plot was harvested with a total of 14kg yield, it was replanted on the same day as a 3rd trial
2022_04_15	10-10.1	Wheat	Elephant fed on two rows of wheat and hippo footsteps were observed in between rows
2022_04_15	S2-1-6.1	Maize/Sunflower/intercrop	Total predation on all maize crop, left sunflower and a few were stepped probably as it passed through to the maize
2022_04_15	S2-1-4.1	Maize/Ditch	Presence of footprints around the ditch shows elephant tried to access the maize crop
2022_04_15	S2-1-3.1	Maize/Sunflower/Cover crop	Footprint shows elephant crossed through the plot, no predation maize are small
2022_04_15	S2-1-1.1	Maize/hives	Elephant cross through plot, zero predation
2022_04_15	10-1.1	Lemon Grass	Fed on six pieces of lemon grass crop, baby elephant footprints found on the plot
2022_04_15	9-1.1	Butternut	Elephant eat one row of butternut
2022_04_15	6-2.1	Maize	Elephant cleared the maize crop in this plot
2022_04_15	1-2.1	Lemon Grass	Uprooted and eat several crops (4) footsteps of baby elephant was observed
2022_04_15	1-3.1	Sukuma	Elephant uprooted a piece of Sukuma but left the leaves at the plot
2022_04_15	1-4.1	Sweet Potato	Elephant fed on sweet potatoes vines that were starting to grow
2022_04_15	2-4.1	Beans	Elephant eat half the bean plot

2022_04_15	2-3.1	Cucumber	Elephant uprooted, stepped and destroyed cucumber, no sign of predation
2022_04_15	7-3.1	Chili	Elephant passed through and uprooted a few, no sign of predating
2022_04_15	8-5.1	Maize	Elephant cleared all the maize crop
2022_04_15	9-8.1	Cucumber	Uproot a few cucumbers
2022_04_16	7-7.1	Wheat	Stepped and fed on the crop on one row
2022_04_16	7-8.1	Spinach	Stepped on a section and fed on a few pieces
2022_04_16	7-13.1	Lemon Grass	Eat three pieces of the lemon grass plant
2022_04_18	2-3.1	Cucumber	Everything has been destroyed by elephants
2022_04_18	2-4.1	Beans	Elephant cleared all the remaining beans
2022_04_18	2-8.1	Potatoes	Elephant stepped through and destroyed one row no sign of predation
2022_04_18	5-11.1	Butternut	Elephant completely destroyed the whole plot
2022_04_18	5-10.1	Lemon Grass	Passed through the plot, no crop was eaten
2022_04_18	5-7.1	Cucumber	Everything destroyed, eaten by elephant
2022_04_18	10-12.1	Cucumber	Elephant passed through, stepped on some and ate some
2022_04_18	9-12.1	Maize	Elephant passed through the maize but they were not eaten because they were small
2022_04_18	10-10.1	Wheat	Completely ate and destroyed the whole plot,
2022_04_18	9-1.1	Butternut	Elephants destroyed the plot and eat the fruits that were growing
2022_04_18	9-8.1	Cucumber	Elephants fed on and destroyed
2022_04_18	11-4.1	Butternut	Elephants completely destroyed
2022_04_18	S2-1-6.1	Maize/Sunflower/intercrop	Elephant completely destroyed and predated on maize in this plot
2022_04_18	1-7.1	Maize	All replanted after it was predated by elephants
	6-2.1		
	6-2.1		
	11-1.1		
2022_04_18	8-8.1	Onion	The two of this plot were replanted for the second time after it was harvested
	10-4.1		
2022_04_18	11-10.1	Managu	Replanted for the second time
2022_04_21	10-5.2	Eggplant	Second Trial transplanted after it failed to germinate due to too much heat and lack of water
	11-11.2		
2022_04_25	1-10.1	Tomato	Transplanted at the plots as the second trial
	5-13.1		
	8-9.1		
	9-3.1		
	11-6.1		



Figure 2,3,4,5,6,7, 8 &9: Sweet potato, cucumber, beans and maize before and after elephant predation.



Figure 10, 11 & 12: Harvested Irish potatoes, gooseberries and cucumber from the farm.



Figure 13 & 14: Maize predated by elephants and elephants trying to reach the maize surrounded by a 1.5-meter ditch.



Figure 15 & 16: A hippo and elephants captured by the camera traps.

Climate Report

Table 2: 1 MEP's Experimental Farm Rainfall Recording April 2022

Date Time	Precipitation (ml) Rain gauge 1	Precipitation (ml) Rain gauge 2 (200m ²)
2022_04_07	4	3
2022_04_17	12	9
2022_04_18	65	45
2022_04_21	5	4.5
2022_04_22	17	10
2022_04_24	13	9
2022_04_26	11	8.4

Tracking Manager Report

One of Mara Elephant Project's most well-known collared bulls, Fred, is in musth, and he's been very busy over the last month. The MEP long-term monitoring (LTM) team spotted Fred recently in Mara North and Lemek conservancies with several female individuals the team is researching. When male elephants are in musth, which can last days or months depending on the available mates, they can become aggressive due to their raging hormones. Luckily Fred is used to our research vehicle and was peacefully allowing our LTM team to film him. During musth, bulls have a very distinct smell coming from urine discharged leaving a scent trail that both humans and

elephants can smell. You can see in the video Fred's impressive size compared to the female elephants, all the better for passing along strong elephant genes.

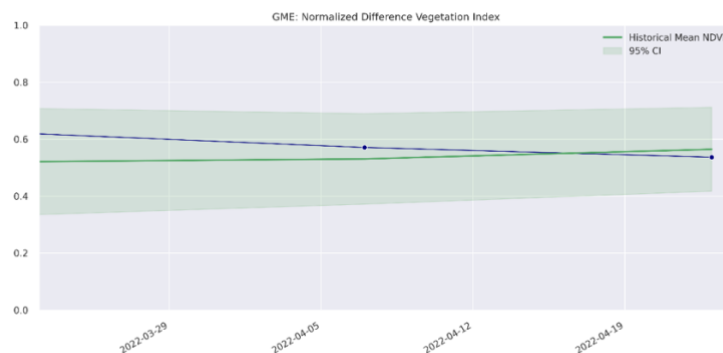


Fred in musth and Chelsea photographed by the MEP "golf" ranger team while on patrol in April.

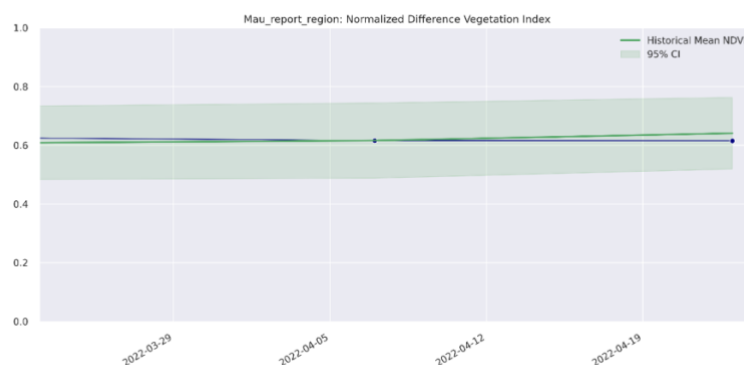
ENVIRONMENT: NDVI

Normalized Difference Vegetation Index (NDVI) is a measure of plant photosynthetic activity. Higher NDVI indicates the plant is greener. The blue trend line shows the current value while the green area shows the 95% distribution of values centered around the green trend line from values measured back to February 2000.

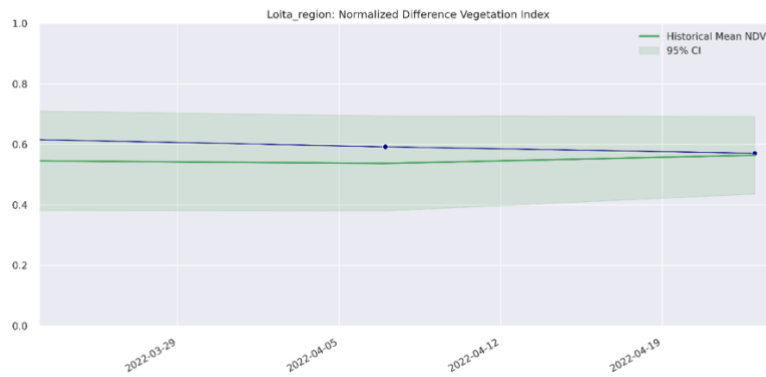
Greater Mara Ecosystem (GME)



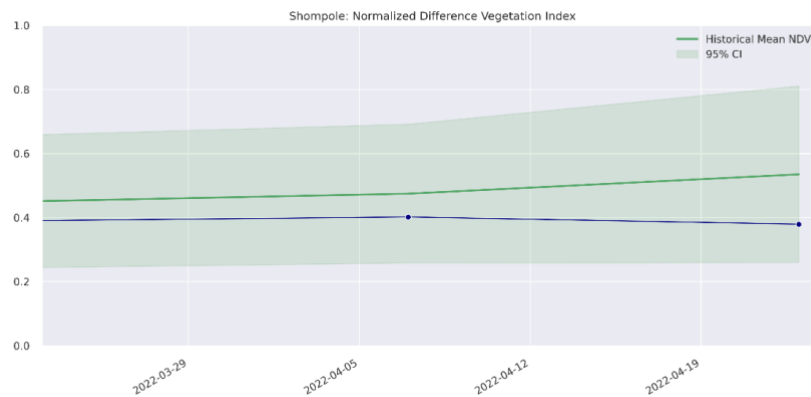
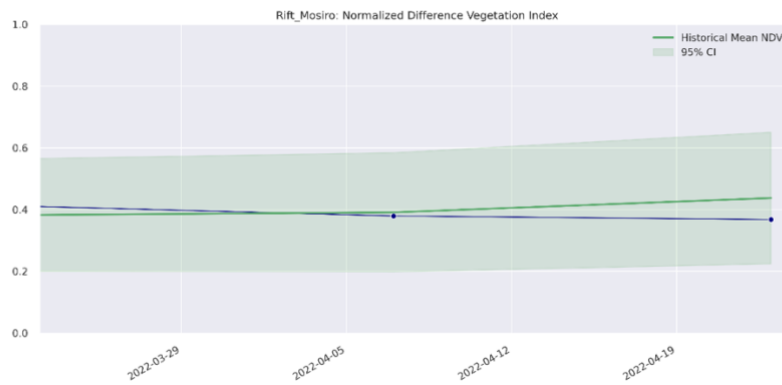
Mau Forest



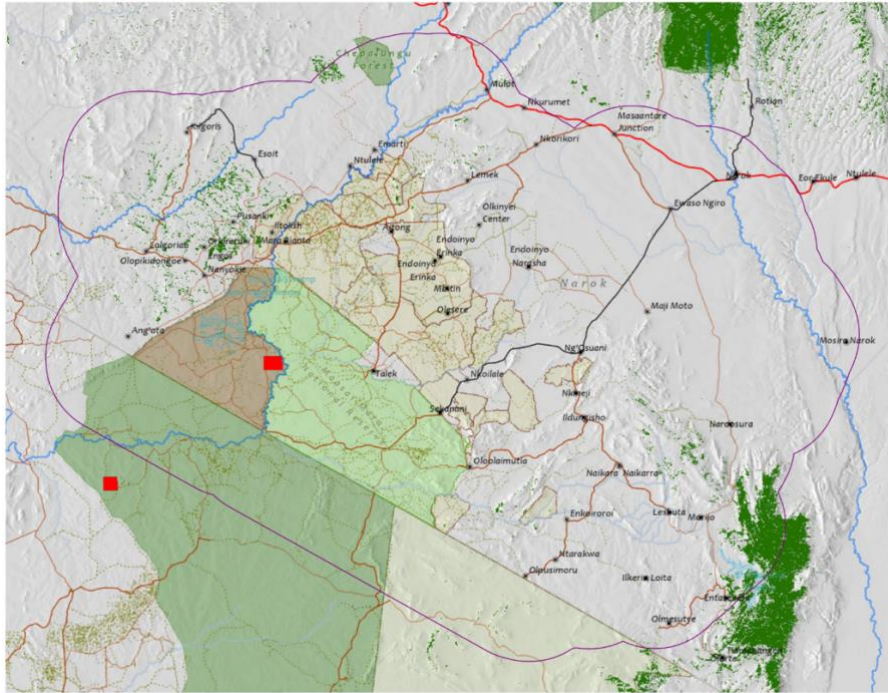
Loita



Rift Valley



ENVIRONMENT: Burn/Fire Areas



Red blocks indicate burn areas as measured by NASA's FIRMS dataset during the period March 1 - April 1, 2022.
Accessed through Google Earth Engine.