

# Elephant Partners

*ElephantVoices' conservation initiative Maasai Mara*

Quarterly Report (3)

ElephantVoices

September 2012



*Big Mama, first registered in 1998, contemplates us; Naboisho Conservancy, August 2012*



## Introduction to Elephant Partners

Using web-based technology, ElephantVoices has developed a unique model for citizens to monitor and help protect elephants. The *Mara EleApp* (<http://elephantvoices.org/mara-eleapp.html>) permits the collection and upload via cell-phone of geospatial, group size and association data to the searchable, publicly available *Mara Elephant Who's Who & Whereabouts Databases* (<http://www.elephantvoices.org/maraelephants-whos-who.html>; <http://www.elephantvoices.org/maraelephants-whereabouts.html>) with Mapping functionality (<http://www.elephantvoices.org/maraelephants-mapping.html>). A registered user can submit the same type of data online with one or more photographs.

With this system we are growing a dedicated, caring community of guides, scouts, researchers, photographers, and tourists who are collecting data on, sharing information about, and working together to sustain the Mara elephants and to inform conservation management. ElephantVoices is mentoring and training these "citizen scientists" expanding their numbers via on-the-ground representation, word-of-mouth and social media. A presentation of the Mara elephant conservation initiative can be seen on "[The Elephant Network](#)" a talk by Joyce Poole during the National Geographic Explorers' Symposium in June 2012 for the session, "Envisioning a Better Tomorrow".

ElephantVoices is supporting the Moi University Masters field research of David Kimutai (KWS MIKE/ETIS officer). Once David has completed his obligations for KWS he will be working in the field helping to train participants and putting special focus on areas of strategic importance. All data uploaded are being monitored, updated and corrected, where necessary, by ElephantVoices via the databases' backend. Joyce Poole and Petter Granli are carrying out this work. The online databases and the *Mara EleApp* were conceptualized and designed by ElephantVoices, and programmed by Verviant Consulting Services in Nairobi (<http://verviant.com>).

The *Mara Elephant Who's Who and Whereabouts Databases* went online in October 2011. This report represents what the system has revealed about the Mara elephants as of the end of the third quarter of 2012.

## Recent field trip - results and reflections

We have recently returned from a field trip to the Mara ecosystem. In addition to trying to sort out a more permanent base, our main priority was to spend time in the south eastern portion of the Mara National Reserve, Olderkesi Group Ranch and in the Loita Hills, in an attempt to establish continuity of elephant occupancy and to explore the routes that elephants may be using to and from the Mara and the Loita Hills/ Naimena Enkiyo Forest (Forest of the Lost Child). This was the first of many recces in the area and we learned an enormous amount from the many people we travelled and stayed with and spoke to along the way. For hosting us particular thanks go to Cottars Camp in Olderkesi; Ol Koroi Camp of Walking with Maasai and Jan's Camp in the Loitas; and Predator/Elephant Aware on Siana. We thank Amos Munai, Kashu Parit, Shiinka ole Karrapu and Lekopien Parletto for guiding us and answering our many questions.

Throughout our safari we used GPS-TRK2, an iPhone App, to map the route we followed. This application allows one to take photographs of elephants, their sign, or other points of interest, along the way and these are then embedded into the route together with location data. Figure 1 shows a 97.1 km (59.7 km linear distance) route we took.



Figure 1. Route we drove along the track from Olderkesi to the Ol Koroi Camp at the base of the Naimena Enkiyo Forest. Each red square indicates a photograph (with GPS location) taken along the way, in this case mostly related to documenting signs of elephants.

We started our field trip on the northern side in Naboisho Conservancy where we met up with the volunteer program that is working with us. We then moved to Cottars Camp to build up our knowledge of the elephants utilizing the South Eastern portion of the Maasai Mara NR and the proposed Olderkesi Conservancy. There is a substantial level of conflict in this area where people are grazing their livestock and even living inside the Reserve boundaries. We witnessed an interaction between a group of elephants and a herd of sheep while we were there in late August and in mid September three elephants were killed within a few kilometers of this spot - two of them had their tusks removed. This is a crucial area of the Maasai Mara and deserves particular conservation effort; it is scenically beautiful, biologically diverse and lies along the Tanzanian border where there is rumored to be substantial ivory trafficking.

After our stay at Cottars we drove to Ol Koroi Camp in the Loita Hills, following a small track that parallels the Sand River, then crossed the elevated Il Karin plains and descended to Entesekera at the base of the Naimena Enkiyo Forest. From there we took the main Naikarra - Tiamenangen road to Ol Koroi Camp (See Figure 1). We saw clear and numerous signs of elephants all the way to the point where our track intersected the main Naikarra-Olpusi Moru road. There the habitat opens up and we observed no further signs of elephants until we reached the camp. However, we were later told that elephants “streak” across these plains at night and are often seen in the evening or early morning making their way to and from this area.

Ol Koroi Camp is situated in Olorte sub-location along an ancient elephant trail that leads from the Naimena Enkiyo Forest down to a river and an extensive system of salt licks at the base of the main hills. Signs of elephants were everywhere, although since elephants tend to visit the area during the rains, they were not fresh. The biodiversity in this area, indeed along the entire route, is remarkable. We were struck by the obvious importance of the entire area - both as connectivity for elephants and for the long-term protection of biodiversity. We spent two days exploring Olorte area and learning from the inhabitants about the movement and behavior of elephants (Figure 2).

From Ol Koroi we drove back towards Entesekera and up into the Naimena Enkiyo Forest to Jan’s Camp where we explored a small portion of the Forest and its use by elephants. Although we did not see elephants we heard them rumbling and trumpeting in the forest not far from the camp. The following morning a walk to the source (Oloiyei Springs) of the Mpurgutia Swamp and Olasur River revealed extensive use of the forest by elephants (Figure 2).

From Jan’s camp we continued back toward the Mara to Siana Group Ranch where we met to discuss elephants and their movements with participant Gini Cowell and her family. Siana is a very important area for elephants, although the habitat is very thick making it difficult to observe them easily.

In addition to the Mara field trip we spent several days in Nairobi with our programmers at Verviant to iron out remaining issues with the databases and also to prepare a separate version of the Who’s Who & Whereabouts for the Gorongosa elephant population. Joyce will be spend three weeks in Gorongosa, Mozambique, in October and this marks our first attempt to use the system for a second population.

## Cumulative Results

### *The sightings*

Accessing the [Mapping](#) function reveals the number of elephant groups observed in the Mara. As of 13 September 2012, 921 elephant group sightings had been uploaded to the [Whereabouts Database](#) (Table 1). These “groups” consisted of lone males, bull groups of greater than one individual, family groups with or without associating males and groups of unknown type (n=51). In addition, 15 mortalities had been uploaded.

*Table 1. Number of observations as of 13 September 2012*

Group type	Number of observations
Overall	921
Single males	148
Bull groups > 1 individual	100
Family groups with or without associating males	622
Mortalities	15

Figure 2. Left to right, top to bottom: Sign of elephants in a river bed; Elephants streak across Il Karin plains at night; Amos & Kashu point out where elephants have gouged salt from a river bank; forest along ancient elephant trail; elephant trail crosses main road; village of Ololunga was built upon ancient elephant trail forcing them to find a new route; Shiinka points out sign of elephants rubbing on a cedar; Joyce learns from Shiinka and Lekopien.



### **The participants**

As of 13 September, a total of 94 different individuals had contributed data to the online database. Participants have included guides, tourists, volunteers, conservancy representatives, Kenya Wildlife Service representatives, veterinarians, and researchers. The system is set up so that people can collect data via the Mara EleApp (freely available for download [on the Android Market](#)) and, once registered, they can upload their observations from their smartphone directly to the [Mara Elephant Who's Who & Whereabouts Databases](#). Alternatively they can enter their observations and photographs online via "My Observations".

### **The Mara elephants Who's Who**

As of 13 September 2012 a total of 760 adult elephants had been identified, individually characterized, given an age estimation and been registered on the [Mara Elephants Who's Who Database](#). Of these individuals 460 (61.4%) are adult females and 290 (38.5%) are adult males (Table 3). An additional 37 elephants have been registered but are not yet uploaded to the site.

The Who's Who Database is fully searchable. An elephant may be identified by selecting a number of traits (sex, age, home area, ear, tusk, tail and body characteristics) that best describe the elephant and which are defined and presented in a number of slideshows available through the [Features Guide](#).

*Table 2. Number of elephants individually recognized*

	Registered online	%	Elephants from latest field trip registered but not yet online	%
Total	760	100	37	100
Female	470	62	22	59
Male	290	38	15	41

### **Using "Mark-Recapture" to estimate the size of the Mara elephant population**

The June 2010 KWS aerial count estimated the size of the Mara elephant population to be 3000 elephants. This figure, represents an increase of 1000 elephants over the 2008 count, which can not be accounted for by natality. It is likely that some of this apparent increase is caused by movement (temporary or otherwise) of elephants into the Mara from areas such as the Mau, Serengeti, Loliondo or the Loita Hills, which lie outside the area normally covered by the count.

Indeed, since the aerial count does not include the forested areas to the east of the Mara it is possible that the entire population (including the Loita Forest and Loita Hills, but excluding those elephants who reside primarily in Tanzania) may be as high as 3500-4000 individuals. The above total (N=797) represents the number of individual *adult* elephants thus far registered. Including calves the number already accounted for is likely to be well over 1,500 elephants.

We continue to record new individuals and hope to be able to use "mark recapture" methodology to approximate the total population size. For instance, we have already made note of 202 individually known adult elephants who make use of Mara Naboisho Conservancy. On our recent visit to Naboisho we photographed 26 adults. Of these only 10 were already registered adults and 16 were new (i.e. 38.5% recaptured). This indicates that while we have made good headway - we could still be less than half way to identifying all the elephants utilizing this one well known area. Using this very rough indication as a guide and doubling numbers to account for calves, there are likely to be upwards of a thousand elephants utilizing this Conservancy at some point during the year.

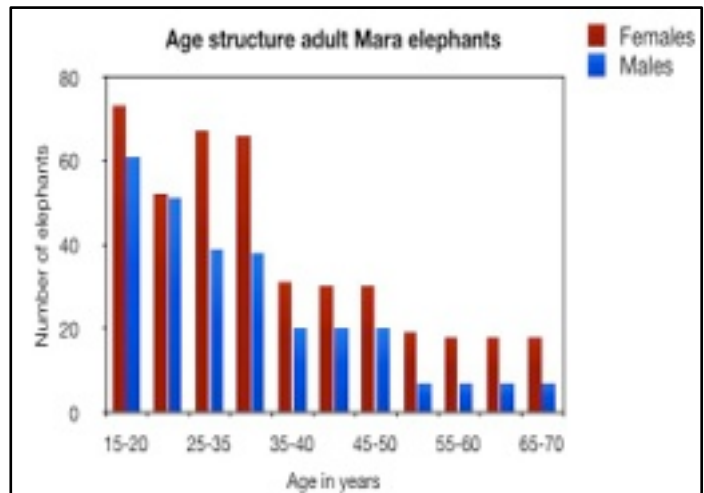
We have noticed that while there is movement across broad areas of the ecosystem it is also the case that as we move into new areas we find largely unregistered elephants. For instance of the 27 adult elephants that we obtained ID photographs of in the South Eastern part of the National Reserve near Olderikesi Group Ranch, only one elephant had been previously registered (or only 3.7% "recaptured").

### **The age structure of adult elephants**

As each elephant is registered, Joyce Poole estimates its birth year. The database is coded such that each year the age of every animal is recalculated and automatically entered into the appropriate age class. Following on from the Amboseli study we use age classes as follows: 0A: 0-4.9 years; 0B: 5-9.9 years; 1A: 10-14.9 years; 1B: 15-19.9 years; 2: 20-24.9 years; 3: 25-34.9 years; 4: 35-49.9 years; 5: 50+ years

The age structure of the adult elephants registered in June is presented in Figure 3. It is immediately clear that the population is skewed toward females. While this is typical of elephant populations (males suffer higher levels of mortality as calves, at independence and as they enter reproductive maturity), the skew is exaggerated in the Mara due to extra pressures on males caused by human-elephant conflict and ivory poaching. Figure 3 reveals that there has been an overestimation of females in the 25-35 year categories and possibly in the 15-20 age group as well. It is likely that some of these individuals belong in the 20-25 age category. Since aging is currently accomplished primarily from photographs such mistakes are not surprising. We will fine-tune ages as we personally observe these individuals.

Figure 3. The age structure of the adult Mara elephant population



### ***The number and distribution of group sightings***

Figure 4 a, b, c and d illustrates the number and distribution of elephant group sightings of different types: all groups, family groups with or without associating males, all-male groups and lone males. The numbers inside the circles (see Figure 4) indicate the number of groups seen. The colors represent: red tear-drop single observation; blue 2<10 sightings; yellow 10<100 sightings; red 100<1000 sightings. The locations of these circles indicate clusters of sightings.

The distribution of family groups (Figure 4b) overlaps with that of lone males (Figure 4c), while groups of males appear to have a different distribution (Figure 4d). Lone males include both sexually inactive and active individuals. Those who are sexually active are in search of females and their distribution, therefore, overlaps with that of family groups.

By contrast, bull groups are typically composed of sexually inactive males. During this phase of their cycle males occupy areas of high biomass in order to bulk up for their next sexually active period. These areas tend to be those with plenty of bush coverage (e.g. Mara Naboisho, Siana, Motorogi) or, in the case of Mara North, areas providing easy access to crops.

### ***The distribution of large groups***

In examining the distribution of family groups (with or without associating males), we noted in our First and Second Quarterly 2012 Reports to Kenya Wildlife Service that the location of large groups (those greater or equal to 50 individuals) is not evenly distributed across the ecosystem. This tendency continues to hold (Figure 5; Table 3) although the proportions are shifting a bit as the sample sizes increase.

Very few large groups have so far been recorded in Mara North, Olare Orok, Maasai Mara NR Central (between Sekenani and Musiara) and Mara Conservancy, while a relatively high percentage of groups observed on Naboisho, Siana and the South Eastern part of the National Reserve are large (Figure 5; Table 3).

### ***Distribution of wounded elephants***

The database allows the upload of information on wounded elephants as well as on elephant mortalities. Such wounds vary from noticeable, but healing, abscesses to arrows and snares still lodged in the animal (Figure 6). To date these data have not been collected very systematically, as not all observers make note of wounds.

Thus far observers have made note of wounds in some 3.8% of sightings of groups inside the reserve (including Mara Triangle/Conservancy; N=211) and 4.5% of groups outside the reserve (N=713). Our own more thorough observations (N=123) indicate that at least 10.7% of groups sighted include wounded individuals.

Of the 40 uploaded wounding cases, 10 were females and 30 were males.

Figure 4. Number and distribution of elephant group sightings: Figure 4a All groups; Figure 4b family groups with or without associating males; Figure 4c lone males; Figure 4d all-male groups

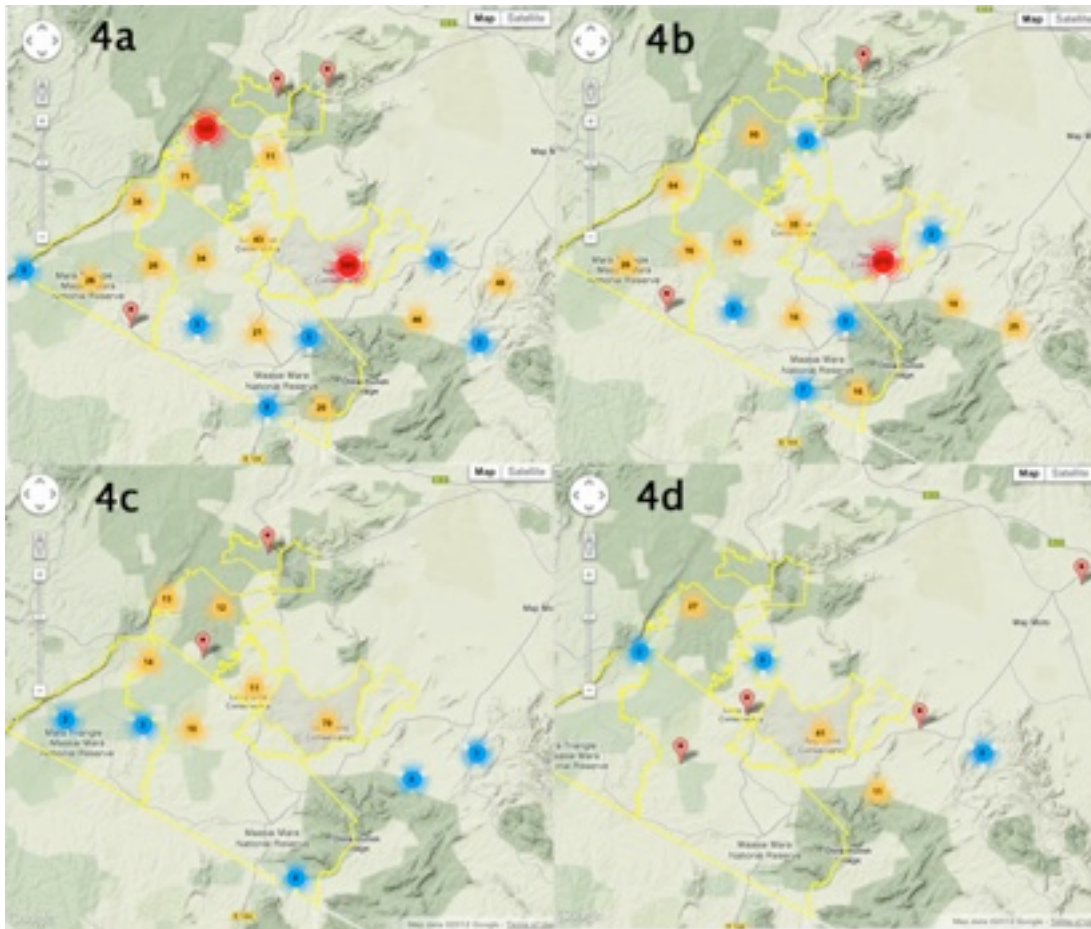


Figure 5. Distribution of large aggregations

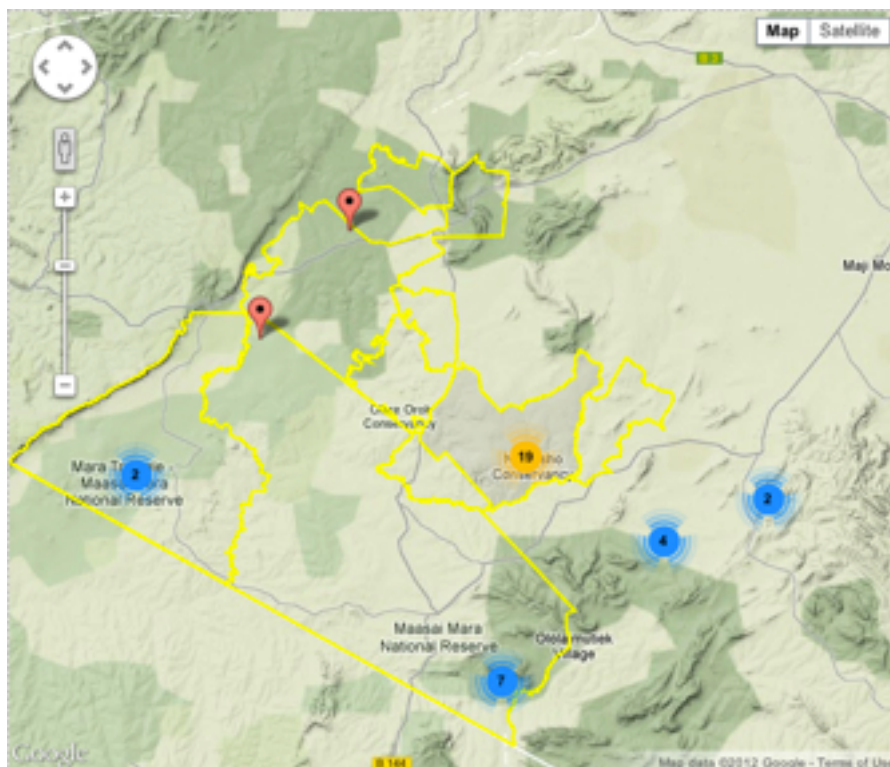
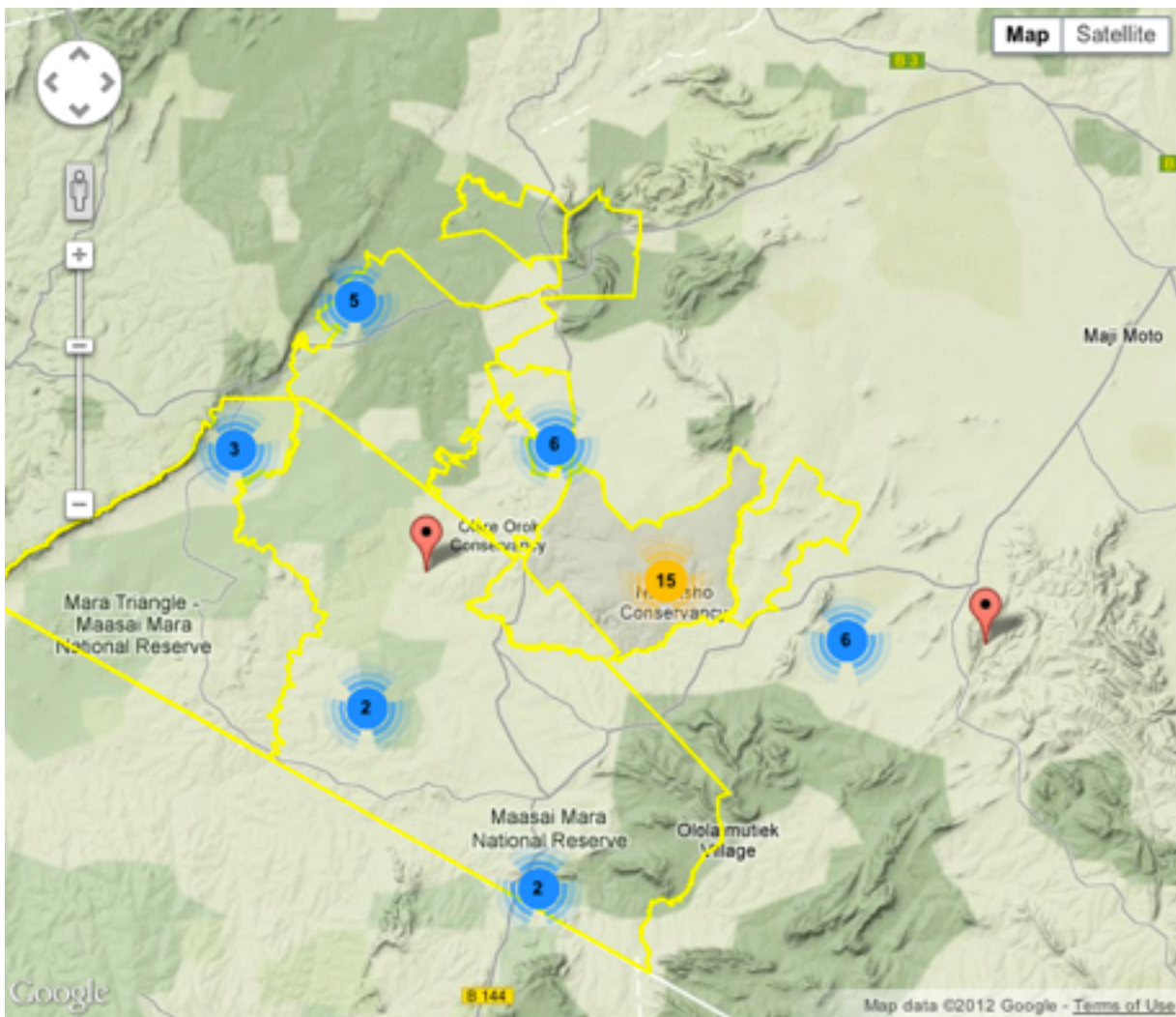


Table 3. Location of large aggregations

Location	No. groups >50	Total No. groups (excluding all-male)	% groups >50 individuals
<b>Overall</b>	<b>36</b>	<b>623</b>	<b>5.8%</b>
Mara North	1	95	1.1%
Olare Orok	0	31	0%
Maasai Mara NR Central	1	82	1.2%
Mara Conservancy	2	63	3.2%
Mara Naboisho	19	272	7.0%
Siana	6	44	13.6%
Maasai Mara NR SE	7	19	36.8%

Figure 6. The distribution of wounded elephants



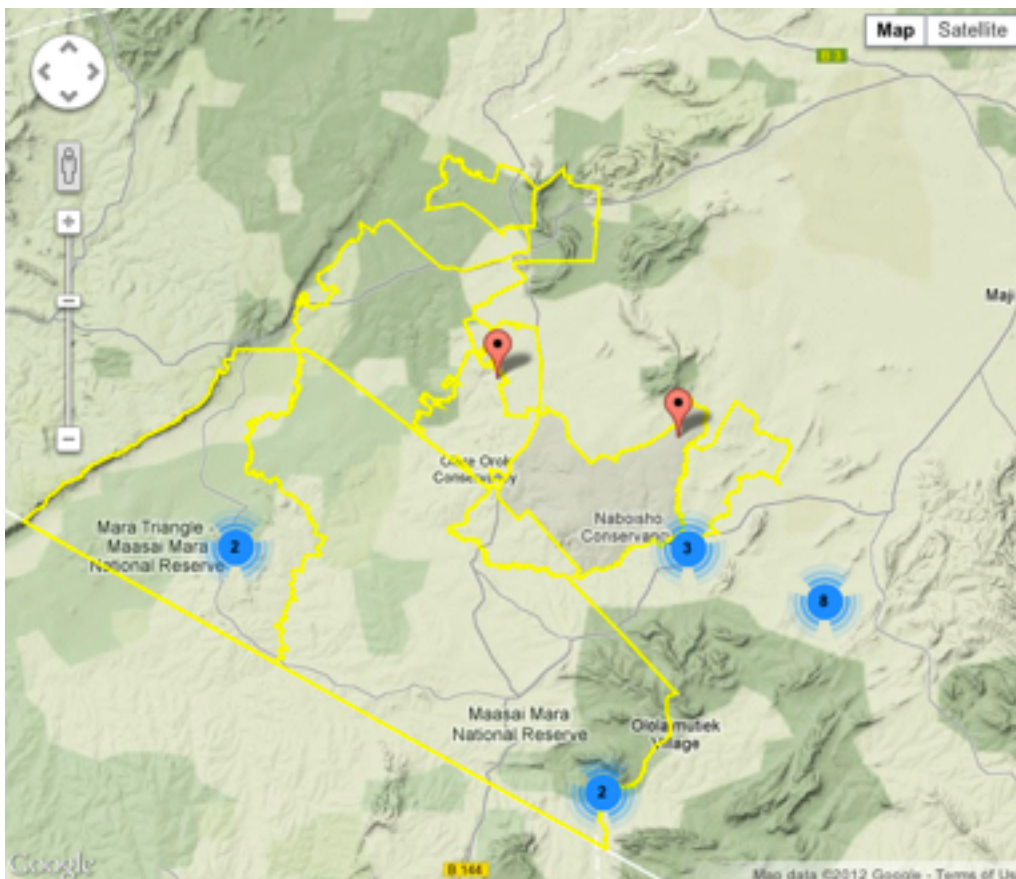


## **Mortalities**

In the last three months there has been spate of poaching on Mara Naboisho Conservancy, Siana, SE Maasai Mara NR and in the Naimena Enkiyo Forest. The tragic death of one of our best known individuals, f0096, named “Goodness” by Maasai Guide, Derrick Naabala, is among those confirmed poached. Goodness was an old matriarch with beautiful long tusks, whom we have known since 1998. On our latest trip we saw her daughter standing alone under a tree with none of the other calves in sight.

Some mortalities have been uploaded to the database via the Mara EleApp (Figure 7). Since January 2012 one observer has recorded 11 elephant deaths all of whom were adult males illegally killed for their ivory. Nine of these individuals were speared and two were killed by unknown means.

Figure 7. Mortality



## **Implications of the data for elephant conservation and management**

### **Bulls and bull areas**

The data continue to suggest that adult males primarily visit the National Reserve when they are sexually active and in search of females and that they otherwise depend on the surrounding bushland for foraging and socializing. As we expand the area covered by Elephant Partners we expect to find that bulls are dependent upon habitat that is less well protected than that frequented by the majority of family groups, and puts males at special risk. That said, males are the pioneers; where males go females often follow.

If we are to ensure the long-term conservation of the Mara’s adult males and the population as a whole we must, therefore, find ways to protect the bushland surrounding the national reserve. Some of these areas, such as Mara Naboisho and Motorogi, have recently been made conservancies, but greater conservation effort - both anti-poaching and habitat protection - are needed if we are to prevent the continuing attrition of males as indicated by the skewed sex ratio, by the relatively high levels of wounded males and by the male dominated KWS mortality data.

## ***Elephant hub***

Mara Naboisho Conservancy was set aside for wildlife conservation in 2010, based on a lease agreement with 502 Maasai landowners. We know that elephants learn quickly where they are safe and where they are threatened and there are several indications that they now see Mara Naboisho as a “safe-haven”. The changing habitat cover, the consistently high number of groups and individuals seen in the area, and the documented movement patterns of individual elephants through Naboisho from other areas, all indicate that it has become a “hub” for elephants.

Elephant Partners data show that while many families appear to have made Mara Naboisho “home” others pass through the conservancy coming to and from Siana, Ol Kinyei, Olare Orok, Motorogi, Mara Conservancy, Mara North and the National Reserve. Many elephants arrive in Naboisho with fresh and infected arrow wounds suggesting that some of these elephants are coming in from less protected areas such as Ol Donyo Erinka, Maji Moto, the Loita Hills, the Lemek Hills and elsewhere. The recent elephant deaths in and around Mara Naboisho indicate the rising pressure on the Maasai Mara as a consequence of the ivory trade.

## ***Large groups, small groups - what can they tell us?***

The data collected thus far on elephant group size indicates a significant discrepancy in the proportion of large groups (those over 50 individuals) between different areas. The tendency for elephants to aggregate can be influenced by social, reproductive, ecological and security factors, and families may aggregate for different reasons in different populations, in different habitats and at different times of the year.

Although the observed differences in our data may be related to sampling error (i.e. the relatively low numbers of sightings recorded in Siana and SE Maasai Mara) this cannot fully account for the sightings observed. It is more likely that ecological differences and/or the level of threat experienced by elephants influences group size in the different areas.

Large groups of elephants are a relatively common sight in the south eastern corner of the Mara and on Olderikesi GR. The elephants in this area cross back and forth from Tanzania and more observations are necessary before we can conclude on the factors affecting group size here. However, the heavy use of the national reserve by livestock, the recent poaching incidents and the proximity to the Tanzania border, indicate that lack of security is a likely contributor to the aggregations. The behavior of elephants on Siana, too, suggests to us that elephants may be in large groups for protection. There has been rather high levels of poaching in and around Siana and the elephants there are particularly agitated by the presence of people, seeking the security of the thick bush when approached. Naboisho, too, has a relatively high proportion of large groups. Together Naboisho, Siana and Olderikesi all represent areas that link elephants to the Loita Hills and the Naimena Enkiyo Forest and, perhaps, therein lies another key to group size.

Although poaching has been equally high, if not higher, in the Lemek Hills and surroundings, the heart of Mara North itself is relatively secure. There family groups are surprisingly small. Indeed, a school project carried out by our daughter, Selengei Granli (2011) found that the average family group in Mara North was significantly smaller than elsewhere in the ecosystem. It is possible that the open nature of the habitat and the relatively short grass (often grazed down by livestock) does not facilitate the formation of larger aggregations of elephants.

## ***Wounded elephants***

The data we have collected on wounded elephants represent a considerable underestimate. We are aware that even the data we have collected ourselves is not as systematic as it should be as it has not been a priority in the initial phase of the project. That 10+% of groups include wounded elephants indicates a significant amount of negative interaction with people. Three times as many males as females were observed wounded. Since there are many more females than males in the population, wounding is clearly disproportionately skewed toward males.

Previous studies have highlighted human elephant conflict hotspots, but it would appear that elephants are being wounded across the ecosystem with very little difference in the wounding rate between groups seen inside or outside the reserve. Such wounds may be received in the course of crop raiding, but it may also represent attempts at ivory poaching.

Since elephants have enormous capacity for memory, are capable of distinguishing between different types of people and are able to retaliate, this level of wounding is a cause for concern and we will be looking at this more closely in the months to come. We also think that the stationing of a permanent vet in the Mara is a matter of urgency.

## Elephant Partners - priorities ahead

Very little is known about the movement, occupancy, numbers and group size of elephants from Maji Moto, Siana and Olderikesi Group Ranches eastwards toward the Naimena Enkiyo Forest. If the movement of elephants is to remain unobstructed across the South Rift, the protection of this area and knowledge of its elephants is crucial. We aim to expand our activities in this region and to collaborate with KWS to carry out an elephant survey of the Naimena Enkiyo Forest. We will continue to strategically recruit and train data contributors both locally and among visitors to the Mara either via tourism entities in the Mara or online.

There is room for further improvements when it comes to the online Google Earth-based [mapping function](#), particularly related to basemaps and basic presentation of data, and further effort will be put into this.

A holistic, collaborative approach to elephant conservation in the larger Mara-Serengeti ecosystem is important. The Arusha workshop, [Elephants in the Borderlands](#), arranged by African Conservation Centre and Liz Claiborne & Art Ortenberg Foundation in mid February 2012 was a major step forward. Based on discussions taken at the workshop, we will contribute toward a data collection and upload system for elephants in the borderlands. We have made a first step by creating a similar system for the Gorongosa elephant population and will be field testing that in October.

We will be spending up to half our time in Kenya and the Mara from 2013 through 2015 and look forward to work with our many Mara friends and colleagues. Lectures on elephants, school presentations, training sessions on elephant behavior, distribution of a poster about elephants and the project, collaboration in general and strategic use of social media will be prioritized during the time in the field, with education and outreach as the overall headline.

## Acknowledgements

The Mara Elephant Who's Who and Whereabouts has now been operative for a year. During this first period Elephant Partners was supported by the Liz Claiborne Art Ortenberg Foundation (LCAOF), Conservation Trust of the National Geographic Society, Fondation Franz Weber, A&K Philanthropy, IFAW, and several generous individuals. In this initial phase of the project we have also worked hard to achieve a multi-year funding base, since we consider predictability, long-term commitment and a hands-on approach to be vital for this collaborative type of project.

We are, therefore, very pleased that in July ElephantVoices was awarded a three-year grant from the JRS Biodiversity Foundation for Elephant Partners, providing the core funding (approx. 2/3) needed for this initiative. We just received word that the project will receive another year of funding from National Geographic, this time from the Northern European Global Exploration Fund. Continued support from LCAOF has been essential for the project and we thank these institutions and the many individuals their continued support.

The success of this initiative depends upon the volunteer participation of many people whose names and affiliations appear online. We are grateful for the broad and enthusiastic support received.

ElephantVoices, Joyce Poole/Petter Granli, 26 September 2012,

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