

# UPDATED LION & CHEETAH FIGURES



## MARA PREDATOR CONSERVATION PROGRAMME

We are pleased to present updated lion and cheetah figures from the 2020 survey period, which spanned from August 1st-October 31st.

## Lions

### New lion figures

Table 1 shows estimates for lion density, abundance, and sex ratio for lions over the age of one year in the Masai Mara (National Reserve and the surrounding wildlife conservancies) for 2019 and 2020. As the table shows, the lion density and hence in lion abundance increased from 2019 to 2020. It is however important to emphasise that this is merely a fluctuation between two consecutive years, and not a trend. However, the overall density from all the data collected so far appears to have a slight upward trend.

Lions	2019	2020
Study area (km <sup>2</sup> )	2,581	2,581
Lion Density	17	20.5
Lion Abundance	427	522
Sex ratio (F:M)	1.74	1.70

Table 1: Lion density is given as lions/100km<sup>2</sup> > 1 year old, lion abundance is lions > 1 year old, sex ratio is female to male

Table 2 shows the same parameters for the respective management units.

Protected area	Abundance		Density	
	2019	2020	2019	
Enonkishu	3	7	8.6	21.4
Lemek	19	20	31.1	32.9
Mara North	45	55	15.4	18.7
Naboisho	38	35	18.1	16.8
Olarro (North+South)	7	8	7.6	10.1
Ol Chorro	7	15	13.01	27.5
Olderikesi	4	4	10.1	11.4
Ol Kinyei	17	14	25.1	21.5
Olare Motorogi	19	58	12.6	39.6
Siana	5	4	14.2	13.1
Mara Triangle	81	91	17.0	19.2
MMNR	183	235	17.5	22.4
MMNR + Mara Triangle	264	326	17.02	20.8
All conservancies combined	164	221	16.52	21.3

Table 2 Lion abundance and density for the different management units for 2018 vs 2019

During our survey period, Olaro-Motorogi scored highest with regards to lion density, followed by 2019's "winner", Lemek Conservancy. When we finish analysing how the different variables we measure, e.g. livestock, prey etc. affect lion density and distribution, we will hopefully be able to give reasons as to why the densities in each management unit differ as they do.

The 2020 lion densities can be viewed in the form of a heat map as shown in figure 1.

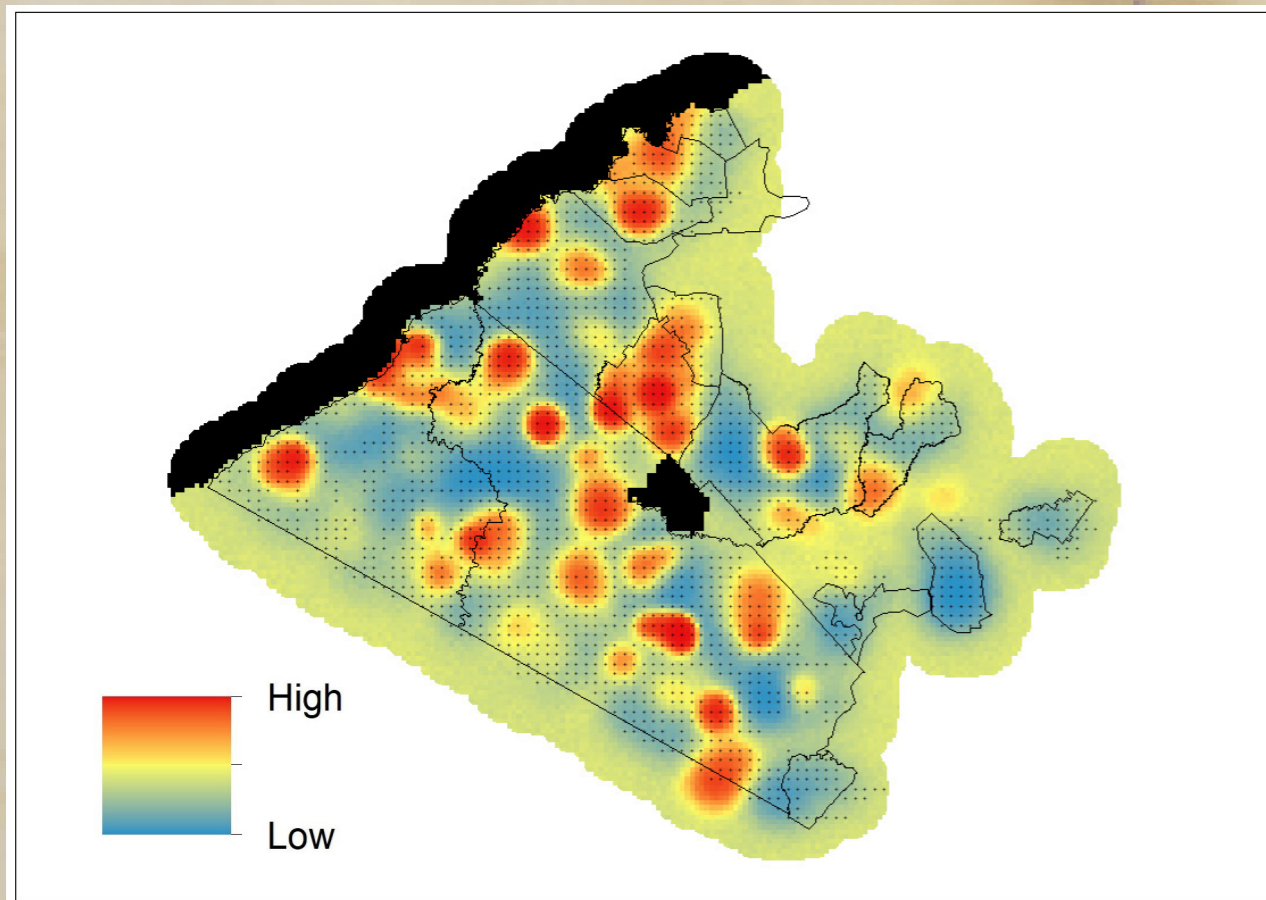


Figure 1. Lion density heat map

## Cheetahs

### New cheetah figures

Table 3 shows estimates for cheetah density, abundance and sex ratio for independent resident adults in the Masai Mara (National Reserve and the surrounding wildlife conservancies) for 2019 and 2020.

Resident cheetahs	2019	2020
Study area (km <sup>2</sup> )	2,544	2,544
Cheetah Density	1.27	1.39
Cheetah Abundance	32	35
Sex ratio (M:F)	0.85	1.22

Table 3: Cheetah density is given as independent individuals/100km<sup>2</sup>, cheetah abundance is for independent individuals, sex ratio is to males to females.

As the table shows, there is only a small fluctuation in cheetah numbers between the two years. Here, it is important to note that we are presenting numbers for resident cheetahs during the three-month survey periods. Cheetahs can have enormous ranging areas, and there are a number of individuals that come into the wildlife areas that are transient or spend most of their time outside the Masai Mara protected areas, like the Serengeti. This explains why we can record a higher number of cheetahs during some surveys than the estimated number of cheetahs within the Mara.

As with the lion data, we have produced a cheetah density heat map, which is illustrated in figure 2.

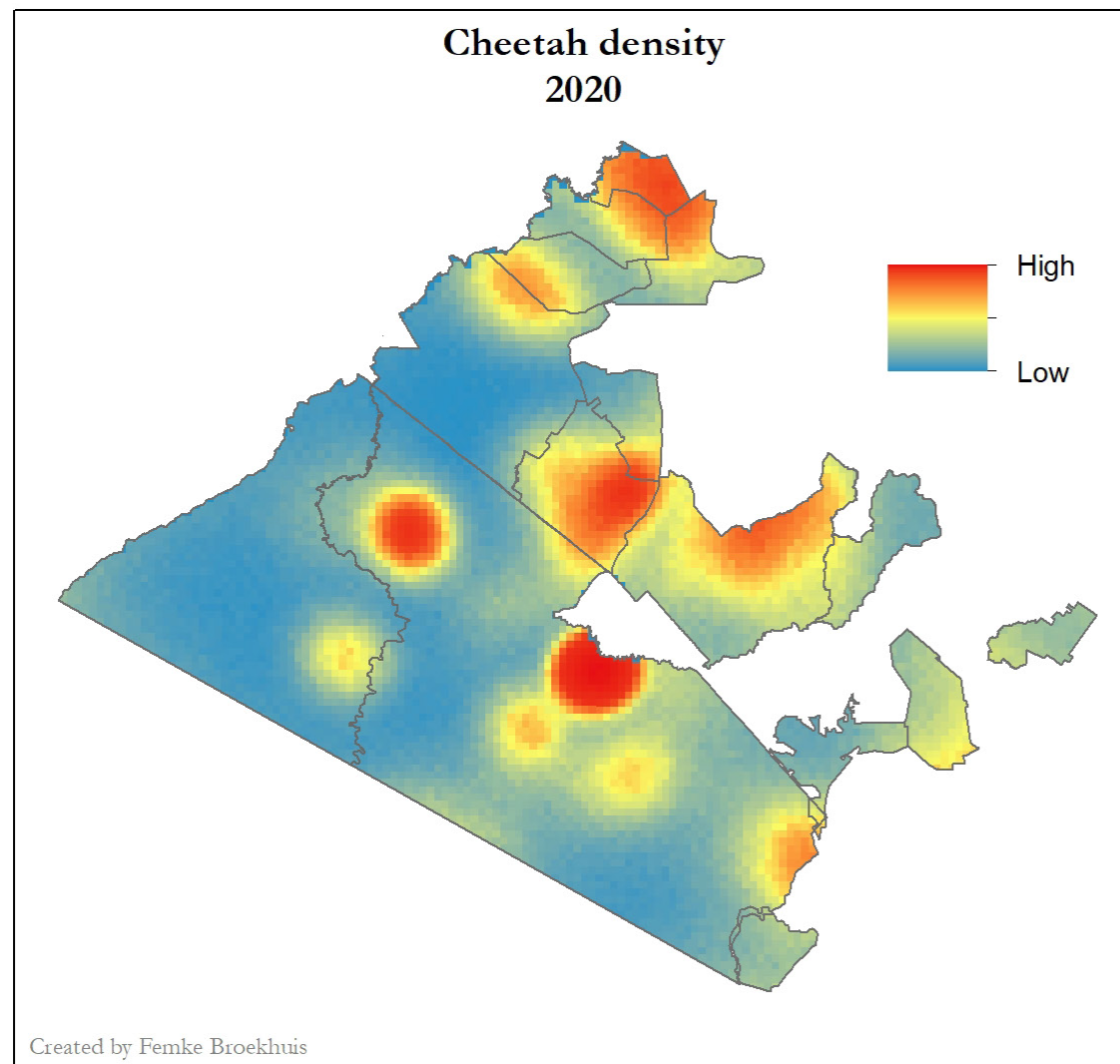


Figure 2: Cheetah density heat map created by Femke Broekhuis. Femke Broekhuis would like to acknowledge the use of the University of Oxford's Advanced Research Computing (ARC) facility in carrying out this work (<http://dx.doi.org/10.5281/zenodo.22558>).

We have completed analysis of cheetah densities from 2014-2020, with two surveys per year from 2015-2018. This is illustrated in figure 3. Again, as for lions and other wildlife populations, it is important to collect long-term data to look at population trends and not just these natural fluctuations as shown in the graph. Because of a low cheetah density and hence a small sample size, a sudden increase or decrease in cheetah individuals like a disease outbreak, will cause large fluctuations within the population.

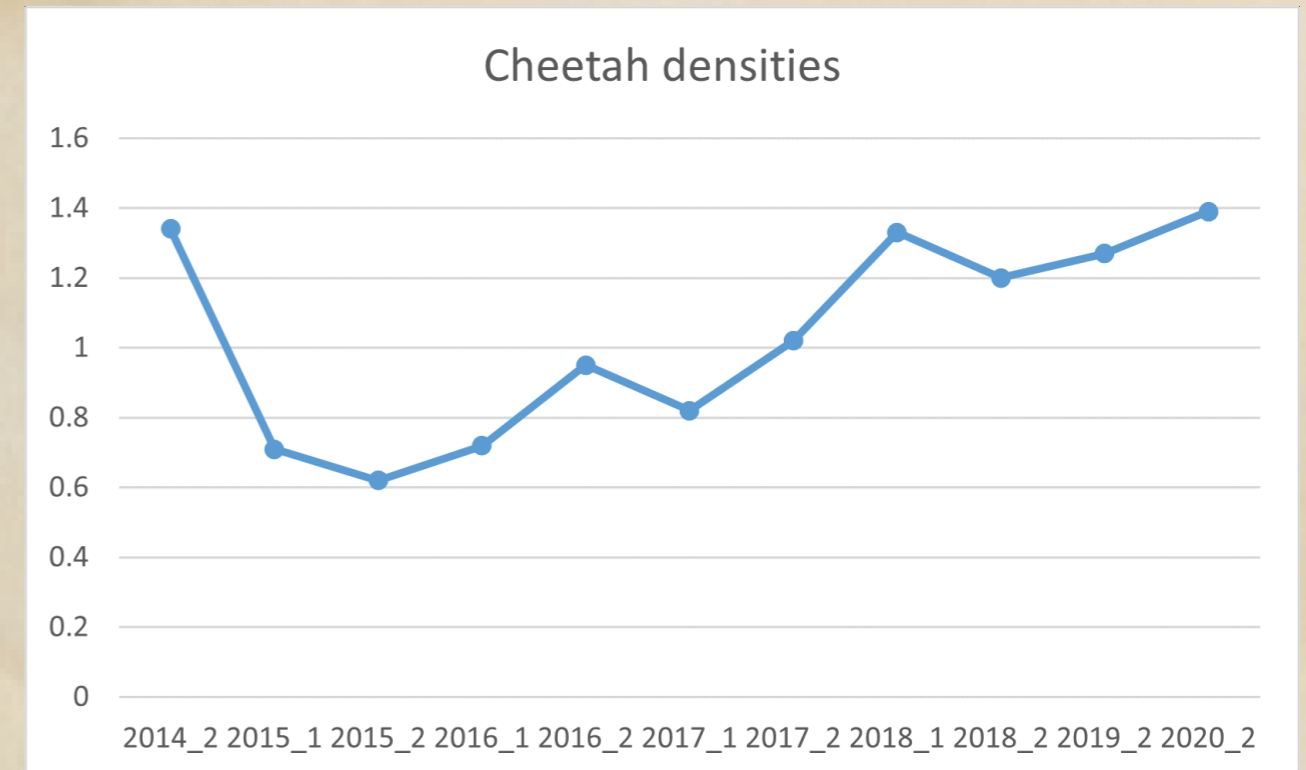


Figure 3: This graph shows cheetah densities (without the error margins) from 2014-2020. There was one survey in 2014, 2019 and 2020 (01August-31October), and two surveys in 2015-2018, 01February-30April & 01August-31October).



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