



## Behavioral response of Maasai giraffes (*Giraffa camelopardalis tippelskirchi*) to Anthropogenic Disturbance in Maasai Mara, Kenya

### Summary

#### Background

We are losing biodiversity at an alarming speed and the human population are increasing day for day. Africa will account for the majority of the growth in human population until year 2100 which can constitute a problem for megafauna species residing throughout the continent. In Maasai Mara in Kenya the human-wildlife conflicts are increasing due to a shift in the Maasai lifestyle, where the traditionally pastoralists community are adopting a more sedentary way of life. One of the species that have felt the negative impacts by anthropogenic disturbance is giraffes which have declined by approximately 76% in Maasai Mara over the last decades. It is important to protect giraffes, since they are ecosystem landscapers – they impact the vegetation structure and thereby facilitates a higher biodiversity. In recent years, conservancies have been mushrooming around Maasai Mara National Reserve as an attempt to alleviate poverty in local communities and support ecosystems and their wildlife through conservation-based tourism. But is the high human presence in conservancies impairing wildlife?

#### Aim of the study

To investigate if giraffes in Mara North Conservancy (MNC) are experiencing a high degree of disturbance in relation to human presence and thereby asses if conservancies constitutes an appropriate approach for conservation of giraffes.

The study tries to answer three research questions:

1. How does anthropogenic disturbance influence the behavior of Maasai giraffes?
2. How does the behavior vary between different classes of individuals and habitat types?
3. Is the herd composition influenced by anthropogenic disturbance?

### Fieldwork – Mara North Conservancy (MNC)

The data used in the study was collected in MNC between the 16<sup>th</sup> of October and the 7<sup>th</sup> of December 2018. With the help of David Noosaron, I observed the behavior of 87 giraffes throughout the conservancy. The data from these observations were later analyzed in relation to objects functioning as a proxy for human disturbance such as the distance to nearest road, settlement areas etc. in addition to data describing the habitat and individual.

### Results and discussion

From the study, it is seen that giraffes upregulate both vigilance ratio and vigilance bouts/hour when close to settlements and additionally, there is a trend for giraffes to upregulate vigilance ratio and bouts/hour when close to unprotected areas and airstrips. In contrast, the observed giraffes show a decreased vigilance behavior when close to roads or areas with higher probability of encountering humans and their livestock. However, the statistic results of the study and my experience from field observations do not give a completely consistent perception of the giraffe behavior. In the afternoon giraffes assemble close to settlements and tourist camps even though it seems from the results that the giraffes should have a higher perception of risk at settlement areas. Additionally, when giraffes encounter livestock, especially cattle, my experience is that they tend to walk away. This could be consistent with the results, since giraffes are not conceived as vigilant in this study when they are moving. Overall, it is clear that human disturbance does affect the behavior of giraffes in the area. When considering research question 2, the results indicate that time spend on vigilance do not change in respect to time of day, however, giraffes do perform a higher number of vigilance bouts of shorter duration in the afternoon/evening than the morning and mid-day. In addition, immature individuals in general perform a significantly higher amount of bouts/hour than adults do, even though the total time spend on vigilance do not differ. Thus, adult individuals have longer bouts of vigilance while immatures have a higher number of bouts of shorter duration. That is, there is a difference in behavior between different age groups but not a difference in varying habitat types. This only leaves question number 3. According to the analysis, a higher number of giraffes assembles close to settlements and unprotected areas than other places in the conservancy.

Some possible explanations for the above results are that the observed giraffes adjust their behavior according to predation risk, aggressivity from humans, group dynamics in herds of different sizes or a combination of these. The vigilance behavior of giraffes is upregulated when close to settlements etc. which could be due to human aggressivity towards them in these areas or due to a greater number of individuals gathered which changes the dynamics and thereby behavior among these individuals. The reason they gather around these areas even though it seems that they relate these with higher risk and therefore upregulate vigilance behavior, could be due to predation risk. Lions tend to keep away from areas that are densely populated by humans. Predation risk can also be the explanation for the difference in vigilance behavior over the time of a day and between adult and immature individuals. Lions primarily hunt in the morning and afternoon/evening and additionally, immature individuals are in greater risk of being victims of the lions' attention.

Overall, it seems that conservancies might be appropriate for conservation of giraffes. The human disturbance in MNC does not seem to increase the perceived risk by giraffes to a level where they are highly impaired even though this have not been directly investigated in this study. However, the fact that giraffes makes daily use of areas with high levels of disturbance, such as settlements indicates that the perceived risk at these locations are not particularly impairing for their welfare.

Funders: Oticon Fonden & Aarhus Universitets Almene Studenterfond