REPORT FOR JAMES RENNIE BEQUEST

LUCY MONHEMIUS

FIELD WORK ASSISTANCE ON LOLLDAIGA HILLS RANCH, KENYA (SUMMER 1999)

Introduction

The Lolldaiga Hills ranch lies 16 km north of the equator and is 200km^2 in extent. It is set amongst the Lolldaiga Mountains, north west of Mount Kenya. To the north of the ranch is the Mukugodo Reserve, which is used by Samburu pastoralists, and to the south the land is intensively used for agriculture by new small-scale settlers.
There are around 60 species of large mammals living on the ranch, including 26 species of ungulates and 5 species of large carnivores (lion, spotted hyena, striped hyena, leopard and cheetah). The ranch is managed primarily for the production of domestic stock, and aims to produce high quality meat and milk for Nairobi, and wool for export. It carries over 4,500 head of cattle, mainly a crossed breed of Red Poll and Boran, and 4,000 head of Merino and Dorper sheep.

Fumi Mizutani (for whom the research assistance was carried out) is the Director of Lolldaiga Research Programme in Nanyuki, Kenya. This programme aims to improve the welfare of rural people through long-term studies in applied ecology and ethnoveterinary medicine. The objective of the research undertaken over the summer was to collect data in order to investigate the transmission of infectious diseases between livestock and wildlife species at man-made waterholes. This information will be combined with the study of traditional ways of limiting disease in livestock, to improve livestock health and biodiversity conservation. The five main diseases that are being transmitted between animals in this area are Tuberculosis, East Coast Fever, Rinderpest, PPR, CCPP and CBPP. The need to understand the population dynamics of such diseases is very important in systems where both wildlife and domestic species are infected by the pathogens, especially in circumstances in which economic, political and health factors play important roles. The most cost-effective and the lowest impact methods to control pathogens need to be established, in order to enhance the ability of wildlife managers to control similar diseases in situations in which they pose a major threat to the preservation of species diversity.

Methods

The research assistance was carried out between August 13th and September 21st 1999, in the rainy season. A total of 11 twelve-hour waterhole observations, and three 24-hour observations were completed. Each observation was carried out at a different dam, and four dams were observed on two or more occasions. The majority of the dams observed were in the northern part of the ranch (low country), and only two dams were observed in the southern part. One dam was used as a control as there were no livestock using it during that time. Observations were usually undertaken every other day, allowing a day of rest in between, and the opportunity to move the hide to the next dam if required.

A 2m x 2m wooden hide was used for observations, which had three observation slits around the walls, the bottom of which was covered by strips of rubber inner-tube in order to minimise detection of observers inside. The hide was bolted to a trailer, allowing it to be moved from dam to dam, by a tractor. For the observations, the hide was positioned near the water (at least 10m away from it), where there was good visibility of the waterhole and where the hide was not too noticeable. During the day, observations were made for two-hour periods, alternating between observers, and during the night (12am-8am) this changed to 4-hour periods to allow time to sleep. Data sheets were used to record observations, which included species observed, sex, and number (usually using binoculars), distance from water (using a rangefinder), direction in and out (using a Silva compass), time in and out, and any other relevant comments. Any wildlife species or livestock seen drinking, or around the waterhole, were recorded. If livestock and wildlife were seen using the waterhole at the same time, the distance between them was measured using a rangefinder. Recording the time in and out of each species was important in order to identify the time lapse between waterhole usage by wildlife and livestock

The 24 hour observations were carried out at the end of August when there was a full moon, to enable night-time visibility.

The distribution of livestock bomas (night-time pens) was established and marked on a map to find out which herds were using each dam, and consequently enabling the biomass of livestock to be calculated for each dam. The biomass of wildlife using each dam was calculated using the number of each species observed, and published data of each species' weight.

When recording observations, abbreviations for species' names were used to minimise time and space. These were as follows:

EL; elephant, GG; Grant's gazelle, SB; steenbok, BF; buffalo, WH; warthog, ZB; zebra, BB; baboon, IM; impala, ED; eland, VM; vervet monkey, OX; oryx, WB; waterbuck, and HB; hartebeeste.

Discussion of Results

The raw data that we collected is with Fumi in Kenya, and we were unable to use statistical analyses on the data due to the small sample sizes and lack of repetitions at each dam.

However, we were able to draw some general conclusions from our observations that would help with the research into disease transmission at waterholes. In general, a smaller number of wildlife species used waterholes that were heavily used by livestock, or that were in close proximity to people, and at a lower frequency of visits. The waterhole observed which was not used by livestock at all (the 'control' dam), was heavily and almost exclusively used by large numbers of elephants that prevented other species from drinking.

From the waterhole observations, one can conclude that the transmission of disease between wildlife and livestock could occur at waterholes, as wildlife and livestock were observed to use the water within short time intervals of each other. On two occasions, wildlife was observed drinking at the same time as livestock. However, this seemed to be a fairly rare occurrence, as it only happened twice, and in one of two situations; either when there was a large distance between the wildlife and livestock (around 200m), or if the herder was not present. It is not the presence of livestock that deters wildlife from drinking, but the presence of people. This can be deduced from the occasion when warthogs were observed drinking with the cattle, as they initially ran away when they saw the cattle, but quickly returned when they realised there was no herder present.

These results could be important when considering the control of disease; perhaps the waterholes should be small to minimise the distance possible between livestock and wildlife, and perhaps a herder should always accompany livestock when going to drink. These factors, when taken into consideration, may be able to help to decrease the frequency of encounters between livestock and wildlife, and therefore the transmission of disease.

In order to obtain more conclusive and statistically viable results, a greater number of replications should be carried out at each dam, and also at a different time of the year, to see if there is a difference between wet season and dry season waterhole usage by wildlife and livestock.