

Maasai Mara

Maasai Mara National Reserve (MMNR) is the northern part of the world-famous Serengeti-Mara ecosystem. Due to its high productivity, it supports a high diversity and biomass of large mammals and is a very important area for many migrants from Serengeti during the dry season between July and November each year. The area also sustains a high number of resident animals. The MMNR is a 1510 km² protected area in the south-west of Kenya on the border with Tanzania (Figure 1). It is situated between 34° 45' - 35° 25' E and 1° 13' - 1° 45' S. It is bordered in the west by the 300 meter high Ooloolo (Siria) escarpment and extends into an area of bushed hills in the east. The area has three main rivers, the Mara River, Sand River and Talek River.

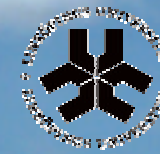
The Mara Triangle is a 500 km² area situated in the south-west of the MMNR. The area consists of high productive grassland savanna with patches of *Acacia gerrardii* (Benth) and *Acacia tortilis* (Forsk.). The dominating grasses are red oat-grass (*Themeda triandra* Forsk.) and *Sporobolus pyramidalis* (Beauv). Thickets are dominated by *Croton dichogamus* (Pax) and *Capparis tomentosa* (Lam.). There are mature stands of riverine forests associated with the main rivers. Some solitary Breadfruit trees (*Kigolia pinnata* Benth) and a few Fig trees (*Ficus sp*) are sparsely distributed over the area. On the plains, the dominating trees are the balanite tree, (*Balanites aegyptica* L) and the sheppard tree, (*Boscia angustifolia* A. Rich.).



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Man made fires -
impact on herbivore
foraging and
distribution
in the Maasai Mara
National Reserve,
Kenya



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Which type of grass should Burchell's zebra (*Equus burchelli*) prefer ?

Savanna ecosystems are found in all continents; the majority in the tropical regions of America, Africa and Australia with the highest distribution in Africa. Tropical savannas are mainly grasslands with a continuous layer of grasses intermixed with discontinuous shrubs and trees. Burnt and un-burnt areas form a mosaic pattern in the landscape which provides a varying quality of food and therefore attract different species of herbivores. The re-grown grass following a fire has a high nutritional value but the quantity is relatively low. Burchell's zebra (*Equus burchelli*) is said to prefer higher grass with less nutrients but is often observed to graze on newly burnt areas.

To see which types of savanna Burchell's zebra prefer, we used areas that were burnt in June (E) and in October (L). Areas that had not been burnt for several years served as controls (C). We selected 36 transects, 9 transects in E, 9 in L and 18 in C. Transects were 1.0 km long and truncated 150 m on both sides. We cut 20 grass samples per transect to record fresh and dry matter. Transects were driven once per hour 6:30 -18:30, i.e. 12 times per observation period. Observers were sitting on seats on the roof of a slowly driving off-road car. This study was carried out in the Mara Triangle, Maasai Mara National Reserve, Kenya, between September 2004 and January 2005.

The highest number of animals was found on areas that were burnt late and had short re-growth of grass. The higher grass did not seem to be preferred due to the high amount of biomass. There were more animals on areas with low amount of biomass due to higher levels of nutrients in the grass.

Animals choose the most suitable area according to their need of quality and quantity of food, risk of predation and their own morphology. Burchell's zebra possess powerful incisors that easily can cut fibrous stems compared to wildebeest (*Connochaetes taurinus*) which upper incisors are absent and the lower close against the hard palate. This cutting mechanism is effective for long grass while the mechanism in Burchell's zebra is effective for cutting shorter grass.

Food requirement in ruminants and in non-ruminants differ due to differences in their gut morphology. Non ruminants normally have a higher rate of food intake and the digestibility of plant material is higher than in ruminants. The ability to assimilate protein in non-ruminants is not as effective as in ruminants. To maintain the same absorption rate, the strategy is to increase the rate of intake and reduce the passage time.

Food intake of Burchell's zebra is usually correlated with the levels of Nitrogen and Phosphorous in the grasses. Grass in savannas that

are recently burnt normally has a higher concentration of N and P compared to grass that is old. Studies have shown that Burchell's zebra prefer grass less than 100 mm in length and may also migrate to find areas with suitable length. In a study where wildebeest and Burchell's zebra were compared with focus on their intake of crude protein, Burchell's zebra preferred a higher concentration of crude protein compared to wildebeest. One of our late fire transects did not burn efficiently which resulted in a higher amount of biomass after the fire compared to other late fire transects nearby. On this transect wildebeest was much more abundant than in any other late fire transect whilst late fire transects nearby instead had a higher abundance by Burchell's zebra. Due to the properties of this transect, it was more comparable to early fire areas. This agrees with the present study.

The classification of Burchell's zebra as a bulk roughage feeder does not agree with our findings.

There is no coincidence that the majority of the individuals are to be found on newly burnt areas. The late fire treatment corresponds best to the needs of Burchell's zebra. This may raise the question if Burchell's zebra can be classified as a bulk roughage feeder or if it instead should be classified as a mixed feeder.