

# Fire: More Friend than Foe

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*Study shows recent fires are helpful to the herbivores of the Serengeti*

From a very young age, we are all introduced to the so called “circle of life”. The cyclic nature of our environment is well documented, and very well represented in media. From the first time we hear James Earl Jones iconic monologue as Mufasa describing the cycle of life and death in ‘The Lion King’, to our experience in science classrooms as we get older, the dynamic nature of nearly significant ecological system is represented in a circular fashion.

Yet generally when we think of these cycles in biology, we don’t associate purposeful destruction with any of them. Yet within the national parks of the plains of the Serengeti, this is the circumstances on a yearly basis. “...areas are burned down every other year. [The park staff] sets areas on fire during the wet season of the year,” says Stephanie Eby from the University of Syracuse, an expert on fire’s effect on the ecology of plain biomes.

The purpose of these fires is well documented. In order to sustain sustainable levels of plant nutrients, fire is used as a crucial tool. Once burnt, the plant life of an area replenishes the nitrogen content of soil, and increases the carbon content as well. This replenishment prevents the soil from being leached of all useful nutrition, and allows future generations of plant life to flourish.

Due to the huge impact fire has on the ecosystem, it is important to understand it’s effects on all levels of life as much as possible. That’s where biologists such as Stephanie come in. Her paper, “*The effect of fire on habitat selection of mammalian herbivores: the role of body size and vegetation characteristics*”, to be published in a future issue of the Journal of Animal Ecology, strives to further understand the effects these fires has on the herbivore life of the Serengeti.

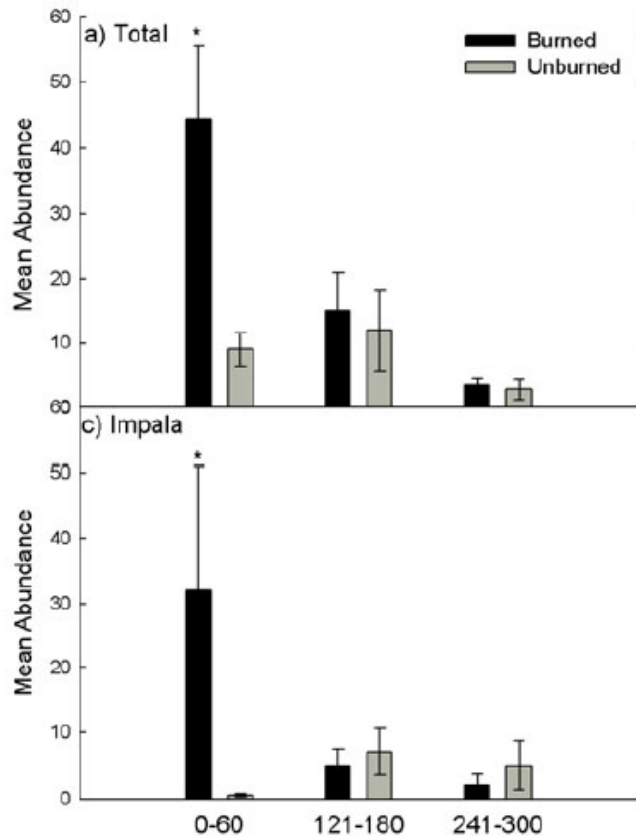
As outlined in her study, the effect of these fires in relation to herbivores is considered to be threefold. Firstly, after a fire the volume of available vegetation is significantly decreased, as plant life has not had sufficient time to regrow. However, the nutrient content of the plant life in these areas is improved dramatically, as a higher soil quality from the fire directly leads to more nutritional plant life. Finally, following a fire the accumulated height of plants is eliminated, leading to shorter bush cover. For an herbivore on the lookout of predators, this increase in sightline can be invaluable for survival.

Overall, it was found that herbivores had a preference for areas burned in the last two to four months, and beyond this any positive selection was no longer significant. This was found by observing areas after they were burned and nearby areas that had been left intact for that season. Counts were performed on grazing animals of several species, and it was found that a significantly higher number of individuals were found in the recently burned areas. This correlation between burned areas and increased populace weakened as larger herbivores were analyzed individually, eventually disappearing altogether in wildebeest, and only having a very small effect on zebra.

In order to determine which of the three factors led small herbivores to select so strongly for recently burned areas, soil composition, average vegetation mass, and the height of bush cover was measured for each of the plots that had been set ablaze. By finding which factors were strongest in the areas most strongly selected for, it became possible to determine the relative strength of each factor.

What was found was rather surprising, as the height of plant cover played no significant role in which areas were selected for. Simply put, the small herbivores were simply drawn to the areas with the highest quality food, and were even observed eating the ash itself in order to get their required nutrition.

This information is invaluable for continued conservation of ecological treasures such as the Serengeti. Yet as Ms. Eby indicates, burning practices need to be closely monitored, as if it occurs too frequently it can negatively affect the diversity of the ecosystems plant life. Hopefully as we build our knowledge of fires role in sustaining the plains of the world, we can improve our ability to ensure a healthy cycle for generations to come.



The abundance of herbivores in burned and unburned areas over time. As seen, burning was highly selected for shortly after the fire, particularly in Impala