

ABSTRACT

Prescribed burning is used in tropical savannas to improve habitat conditions for domestic and wild herbivores, but its effects on the ecological interactions between these herbivore guilds have never been assessed experimentally. Understanding such effects will contribute towards more informed management of both guilds in landscapes where they share habitats. We investigated the effects of burning on the nutritional outcomes for cattle sharing habitat with wildlife in a Kenyan savanna ecosystem. We compared forage availability and cattle forage and nutrient intake rates across burned and unburned areas cattle accessed exclusively, and those they shared with medium-sized wild ungulates, both with and without megaherbivores (elephants and giraffes). We performed these measurements in May 2013 (wet period, 2 months post-burning) and February 2014 (dry period, 11 months post-burning). Additionally, we monitored wildlife use of these areas. Prescribed burning enhanced cattle nutrition, but only in areas cattle did not share with wildlife. Shared foraging with wildlife reduced cattle forage and nutrient intake rates by 37–97% in burned areas (burns), but not in unburned areas; these reductions corresponded with reduced herbage availability in the shared burns. In May (the wet period), cattle met their nutrient intake requirements in burns, regardless of whether they were sharing these areas with wildlife. However, in February (the dry period), nutrient requirements were unmet or tended to be unmet in burns shared with wildlife; requirements were met or significantly exceeded in the unshared burns. Experimental exclusion of megaherbivores did not moderate these effects, suggesting that they were primarily caused by medium-sized wild ungulates which were highly attracted to burns. Synthesis and applications. Prescribed burning produces negative nutritional outcomes for cattle when sharing habitat with wild ungulates. Because these effects could negatively influence livestock–wildlife coexistence, burning should be applied prudently in such human-occupied savanna landscapes. Specifically, because unburned areas serve as refuge foraging areas during the dry season, interspersing burns with unburned areas could minimize fire-driven negative interactions between cattle and wild ungulates. Conversely, burning could be used to draw wildlife away from valuable cattle foraging areas, such as those near available water.