

Abstract:

The large mammals of African savannah are a well-studied group of animals, but few studies focus on the temporal, circadian activity of this group of mammals. Such studies either use problematic methods of data collection (webcams, direct observations) or have been conducted in national parks or large reserves, where movement of the animals is not limited with anthropogenic structures. In such sites, the community of large mammals is usually complete, including the guild of large carnivores. Thus, small, fenced off reserves without a complete community of large mammals are understudied. Therefore, this work focuses on the spatio-temporal activity of ungulates at water sources in the Mokalakwena River Reserve in South Africa, which is an example of a reserve without large predators except the leopard (*Panthera pardus*). I used camera traps to assess the activity of ungulates, which I placed alongside the Mokalakwena River and at the water holes. With the help of artificial intelligence, I classified the photos to the level of activity of each species. I then tested this activity over space (type of water source) and against biotic and abiotic factors. The activity of ungulates at water sources is influenced by the maximum daily temperature, as the activity shifts to the evening hours during higher temperatures, most likely due to cooling. This activity is also influenced with the size of the animal. Species with a body size of 10 – 100 kg visit water sources significantly more during daytime hours, while animals with a body size of 100 – 1000 kg do not differ significantly in their activity between day and night. The presence of juveniles affects temporal activity, probably more in larger species. It is clear from the literature that the reason for these differences is most likely the activity of predators. Some species of ungulates show spatial segregation, with species of the genus *Tragelaphus*, waterbuck (*Kobus ellipsiprymnus*) and giraffes (*Giraffa giraffa*) visiting the river more than expected. Conversely, some species avoid others in the temporal scale, but the overlaps of activity are not significantly influenced with body mass difference between the species. However, there is a significant difference between pairs of species, where at least one species is a mix-feeder or an omnivore, and pairs of species that are browsers or grazers. The overlaps are lower in the first group.

Key words: mammals, ungulates, savanna, water sources, Africa, spatio-temporal variability, temporal activity, camera traps, AI