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Long-term social network analysis of large herbivore species in an African savanna landscape

Interspecific social networks are an essential part of the structure and functions of many communities and understanding the formation is critical to natural resource management and conservation. These networks can determine how herbivore populations and communities grow, function and respond to environmental changes. Our study draws on five decades of monitoring the 8500 square-kilometre Amboseli ecosystem in southern Kenya, to present a multi-species social network analysis of twenty large herbivores modelled within a 5 by 5 KM grid system. The analysis is implemented using machine learning schemes. The species include wild and domestic herbivores comprising of grazers, browsers and mixed feeders. Herbivores can group for reasons ranging from seasonal resource selectivity based on quality and quantity, to predator avoidance. The results point to interspecies social network connections that are likely to change with increased human influence shaping the ecosystem. The multispecies network model also provides a strong basis for mapping long-term animal characteristics that eventually leads to deeper understanding of species behavior and the significance of space and mobility in alleviating the ecological disruption of compressed populations.