

ABSTRACT

Land-use change remains the main threat to tropical forests and their dependent fauna and flora, and degradation of existing forest remnants will further accelerate species loss. Forest degradation may result directly from human forest use or through spatial effects of land-use change. Understanding the drivers of forest degradation and its effects on biodiversity is pivotal for formulating impactful forest management and monitoring protocols, but such knowledge is lacking for many biodiversity hotspots, such as the Taita Hills in southeast Kenya. Here we first quantify effects of social factors (human activity and presence) at plot and landscape level, forest management (gazetted vs. non-gazetted) and spatial factors (fragment size and distance to forest edge) on the vegetation structure of indigenous Taita forest fragments. Next, we quantify effects of degraded vegetation structure on arthropod abundance and diversity. We show that human presence and activity at both the plot and landscape level explain variation in vegetation structure. We particularly provide evidence that despite a national ban on cutting of indigenous trees, poaching of pole-sized trees for subsistence use may be simplifying vegetation structure, with the strongest effects in edge-dominated, small forest fragments. Furthermore, we found support for a positive effect of vegetation structure on arthropod abundance, although the effect of daily maximum temperature and yearly variation was more pronounced. Maintenance of multi-layered forest vegetation in addition to reforestation maybe a key to conservation of the endangered and endemic fauna of the Taita Hills