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The interplay between historical land-use and the distribution of *Helichrysum* shrubs in an African-protected grassland

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Abstract

Human land use can have lasting impacts on landscape characteristic, yet there remains a lack of information on how former land use affects plant communities in protected African grasslands. In this study, we investigated how land uses prior to the creation of Kitulo National Park, Tanzania, shaped the presence and abundance of the native shrub, *Helichrysum* species. We evaluated both plant species composition and soil properties across the park by dividing our sample into three different zones of historical land use based on participatory mapping. We divided the park into three former land uses: (1) livestock grazed and cultivated; (2) grazed only and (3) wild grazing with limited human impact. We observed that former grazed cultivated land use had five times higher *Helichrysum* abundance than former 'wild' land use. Soil pH, magnesium and phosphorus levels varied significantly across zones of historical land use but not between sites with and without *Helichrysum* species. *Helichrysum splendidum* was more abundant in soils with low soil phosphorus and magnesium concentrations. Our study demonstrates that historic grazing and cropping land uses through changes in soil nutrient properties can explain current *Helichrysum* species spread in protected areas. As such, conservation management plans would benefit from integrating mapping of former land uses to target interventions for problematic encroaching shrubs.