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How Does Grazing Intensity Affect Different Vegetation Types in South African Semi-arid Rangelands? Implications for Conservation Management

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Abstract

The Knersvlakte in the Succulent Karoo Biome (South Africa), which is known for its high diversity and endemism, has been subjected to domestic livestock grazing for centuries. In the course of establishing a conservation area there, it became relevant to assess the suitability of alternative future landuse practices. Thus, we investigated the effects of grazing on the vegetation of the Knersvlakte in terms of species diversity and composition as well as plant size and reproduction of selected species. Data were sampled on four adjacent farms, one of which was ungrazed, one moderately and two intensively grazed. Plant community and population data were collected on 27 quartz and 24 non-quartz plots, representing the two major habitat types of the region. Within each of the 1000-m² plots, 100 subplots of 400 cm² size were sampled. ANOVAs revealed that the species richness and abundance of endemic species on quartz fields was only slightly reduced through grazing. An association of plant strategy type and grazing intensity could not be detected. Ordination and fidelity analyses indicated that species composition differed between grazing intensities and that the ungrazed and moderately grazed plots both contained unique locally endemic habitat specialists. Reproduction of the endemic dwarf shrubs *Drosanthe-mum schoenlandianum* and *Argyroderma fissum* (both *Aizoaceae*) was increased through moderate grazing, which in the case of *D. schoenlandianum* was ascribed to overcompensation for experienced biomass losses. From the nature conservation point of view, either the ungrazed or the moderately grazed plots showed the most favourable status in most of the parameters. In the Knersvlakte, both ungrazed areas and moderately grazed areas therefore seem to be important for the conservation of the existing plant diversity, vegetation pattern and their underlying processes.

Keywords: Biodiversity, compositional shift, herbivores, quartz fields, South Africa