Does the number or size of plant patches contribute to vegetation restoration of restoring degraded alpine steppes via grazing exclusion?

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Abstract

Arid and semi-arid vegetation is characterized by plant patches of different sizes, and plant cover is determined by patch size (PS) and number of patches (NP). However, it is still unclear how PS and NP contribute to the restoration of degraded grasslands through grazing exclusion (GE). Transect lines were sampled in six alpine steppe communities in Tibet in 2017 and 2018. Both PS and NP were assessed and compared between inside and outside grazing exclosures. Our results showed that grazing exclosures increased the mean size but decreased the total number of plant patches. This pattern of change was common to other species and could not be attributed to a shift in community composition. The results suggest that the recovery of the degraded alpine steppe is being driven by PS at the expense of NP. By promoting the expansion of the larger patches while excluding the smaller ones, GE led to an aggregating pattern with a higher proportion of bare ground, potentially reducing primary productivity.

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