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Original Article

Community Structure and Productivity in Western Mongolian Steppe

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Abstract

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The people of the Mongolian steppe have maintained a sustainable, nomadic lifestyle. However, several ecological processes are threatening their way of life. Ecological changan be detected through the analysis of quantitative and qualitative data. It is therefore, imperative to develop a sustainable rangeland management system aimed at combating desertification. In this study we quantitatively and qualitatively describe several western Mongolian steppe plant communities by examining species composition, plant volume and community structure. Study sites were located in the Uvs and Khovd provinces and had all been affected by livestock grazing. A total of 48 species were found. *Stipa krylovii*, *S. gobica*, *Cleistogenes songorica*, *Koeleria cristata* and *Ajania achilleoides* were dominant. There was a significant relationship between biomass and plant volume at all sites. Study sites were classified into four groups using cluster analysis, based on the presence or absence of several species. More than 90% of plant volumes at all groups were perennial grasses and perennial forbs. The ratio of C_3 to C_4 plants at site 3 was reversed in comparison to the other sites. Species highly palatable to livestock were dominant at all sites. To ensure the sustainable use of biological resources in these arid areas, these findings should be taken into account in designing land-use plans.

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Introduction

In light of the current explosive global population increase, the sustainable use of biological resources has become an increasingly important issue (Davies *et al.,* 2012). This is a particularly pressing problem in arid and semi-arid ecosystems such as steppe and desert steppe, which have low rates of biological resource production. In these ecosystems, unsustainable use of resources leads to increased risk of land degradation (Fujita & Amartuvshin, 2013).

Traditional nomadic pastoralism is commonly practiced in regions of the Mongolian steppe. Degradation of the steppe because of excessive use has become a growing concern over the last few years. The multiple stable state model is able to explain these changes (Westoby *et al.,* 1989). The peoples of the Mongolian steppe have maintained their nomadic lifestyle. However, their nomadic existence has been threatened as a result of several ecological processes, such as