

## **Quantifying ecosystem services of mown, grazed and abandoned grasslands in the Csík Mountains (Eastern Carpathian Mountains, Romania)**

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The quality of ecosystem services depends on the health and the proper functioning of ecosystems, which may be strongly affected by land use practices. Mowing and grazing have been typical traditional management regimes in grasslands of Eastern Carpathian Mountains (Romania) for more than a century. However, large areas covered by mountain hay meadows are currently threatened by abandonment of haymaking or conversion into pastureland. In this study we compared provisioning services of mountain hay meadows, abandoned meadows and pastures in the Csík Mountains of the Eastern Carpathian Mountains. The provisioning services analyzed were animal fodder quality, health and well-being (medicinal and aromatic plants), pollen and honey provision, nitrogen fixation, nature conservation (red-listed and endemic species) and chemical compound provision (toxic plants). Our dataset consisted of presence and cover of herbaceous plant species in 196, 1 m<sup>2</sup> plots distributed over a 200 km<sup>2</sup> area and grouped in four sites.

The very good quality fodder plants had consistently higher frequency and abundance in pastures. As well, the few excellent quality fodder plants which occurred in the plots had higher frequency in abandoned meadows because of their good competitive ability, and acquired higher frequency and cover in pastures because of a good tolerance to trampling by grazing animals. However, intensive grazing caused a significant drop in pollen provisioning and rare plant conservation services. Honey

provider- and nitrogen fixer species, red-listed-, toxic- and pollen-provider plants tended to have highest frequency and abundance in mown meadows.

Our data represents a strong evidence for the fact that low intensity mowing, which may include short-term abandonment episodes coupled with the traditional seasonal light grazing in autumn, is the best practice to produce and maintain a high variety of provisioning services in the studied grasslands. This seems achievable by the maintenance of both the hay meadows and pastures in the system, at a ratio close to the traditional levels. There is a high need for well-designed agricultural and conservation policies to maintain this balance.