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Effects of Grazing Intensity on Selected Trees and Shrubs in Sub- andean Silvopastoral Systems in Bolivia

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Abstract

The mountain forests of the Bolivian Subandino are traditionally used for cattle grazing. Large parts of these silvopastoral areas are located in regions dedicated to nature conservation, and there is concern that cattle grazing may alter plant species composition and vegetation structure of the forest. There does not exist published knowledge concerning cattle diet in Subandean forests and the impact of different cattle stocking rates on forest vegetation. In a controlled grazing experiment, the effect of different cattle stocking rates on the intensity of browsing on trees was assessed. In the community of Salinas, Department of Tarija, Bolivia, inside the Reserva Nacional de Flora y Fauna Tariquia, an experimental area divided into three parcels of 100m × 300 m each, consisting in one third open pasture and two thirds forest (Bosque Montano Tucumano-Boliviano), was established. The parcels were stocked with different numbers of cattle: i) cattle stocking rate typical for the region (total animal weight 1286 kg); ii) cattle stocking rate significantly lower than usual (694 kg); iii) cattle stocking rate significantly higher than usual (2001 kg). Naturally regenerated trees (427 plants of 9 species) were selected, and the browsing intensity was assessed once per week during six weeks, using a scale of five levels based on the measurement of shoot lengths and numbers of leaves. The woody plants of the parcel with the highest cattle stocking rate were browsed significantly more intensely (25–50 % browsed) than the woody plants in the parcels with lower cattle stocking rate (1–25 % browsed). The plant species browsed most intensely was the shrub *Piper amalago* (between 25 % and 50 % browsed), followed by the tree species *Allophylus edulis*, *Cedrela sp.*, *Diatenopteryx sorbifolia* and *Chrysophyllum gonocarpum*; *Barnadesia odorata*, *Celtis iguanaea* and *Patagonula americana* were browsed less intensely by the cattle; the latter was browsed only in the parcel with the highest stocking rate; *Myrciaria floribunda* was not browsed at all. Since the cattle mainly browsed on species with tender leaves, these plant species might be most threatened by grazing cattle.

Keywords: Andes, forest grazing, livestock nutrition, silvopastoralism