

Submitted Abstract

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Abstract

In Argentina Puna, livestock grazing is the main productive activity; but is undergoing a generalized process of passive herbivore rewilding due to land use disintensification. In this process wild camelids are recovering while livestock decreases and concentrates around the human settlements. Peatlands are the most diverse ecosystem in the region and are key resources for herbivores. Here, we tested the hypothesis that herbivore rewilding is associated with higher biodiversity of three taxonomic groups: plants, aquatic macroinvertebrates, and birds. We sampled 50 peatlands distributed in the Argentine Puna, along an elevation range from 3200 to 4700 m asl. Using Non-metric multidimensional scaling (NMDS), we developed a “wilderness index” that combines different proxies of human pastoral use (herbivore feces, “puestos”, accessibility to human settlements, field counts of herbivores). In general, the diversity of the different groups was negatively correlated with elevation and positively correlated with peatland area. We used the residuals of a model to control for these two variables and test for the correlation between biodiversity patterns (Shannon and Simpson index, richness) and peatland wilderness index. Contrary to our expectations, plant and macroinvertebrate communities’ biodiversity showed slightly negative statistically significant correlations with wilderness, while birds showed no association. Potential explanations for this pattern include (1) diversity of microhabitats generated by a more diverse herbivore’s community associated with livestock (e.g., different trampling, browsing, and movement patterns, effects on water quality through feces), (2) peatland management practices that provides stability, (3) herbivory dynamics that promote the dominance of certain plants. Overall, the results reject the hypothesis that herbivore rewilding automatically results in biodiversity gains, and emphasize the importance of understanding the socio-ecological mechanisms by which human land use (including exotic livestock) contributes to the biodiversity maintenance in these key ecosystems