



## **Land-use change in the Pyrenees: effect of abandonment on the C and N distribution of mountain grasslands.**

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Extensive grazing in mountain grasslands in the Pyrenees is switching from a balanced use in herds guided by experienced shepherds to an irregular distribution concentrated in the most easily accessible areas, where animals select preferred grazing patches. As a consequence, grazing by domestic herds has stopped in many grassland areas, which are now being abandoned. Such management changes are expected to affect the functioning of these grassland ecosystems, including resource allocation and changes in the species composition. This study compares grazed and abandoned grasslands in the Alinyà valley (Eastern Pyrenees, over 1700 m a.s.l) to assess the effect of abandonment on the C and N cycles. We analyzed the biomass of the different plant components (above- and below-ground), the composition of the functional groups (graminoids, legumes, non-legume forbs, cryptogams), and the C and N distribution along the soil-plant components.

We found that, after 12 to 15-years, abandonment produced changes in species composition, phytomass allocation, and C and N partitioning among the plant components. The grazed ecosystems maintained a larger proportion of non-legume forbs and graminoids, and larger below-ground biomass. In addition, they accumulated more C and N in the soil. Overall, abandonment tended to produce less fertile soils. Grazing abandonment seemed to reduce the accumulation of C and N in the soil and the ecosystem productivity thereby decreasing the system capacity to act as a C sink.