

REWILDING THE UPLANDS: the effects of removing sheep grazing on soils and plants

Rob Marrs, University of Liverpool, provides a summary of his recent research into sheep grazing and the impacts on soils and plants.

(Re)-wilding is a popularised means for enhancing the conservation value of marginal land. In the British uplands, it will involve a reduction, or complete removal, of livestock grazing (sheep), based on the belief that grazing has reduced plant species diversity, the ‘Wet Desert’ hypothesis. The hope is that if livestock is removed, diversity and the nutritional value of the vegetation will recover. In Scotland’s red deer range, reducing or removal of deer has been an equally important focus of rewilding approaches.

We tested this hypothesis in two studies at Moor House National Nature Reserve (North-Pennines), where seven sets of paired plots were established between 1954 and 1967 to compare ungrazed/sheep-grazed vegetation.

In our first study we just compared the nutritional value of the total vegetation inside and outside the enclosures. There were almost no differences between grazed and ungrazed vegetation. However, there have been changes in species composition with some species, that must have been reduced by grazing, recovering after the grazing was stopped. This suggests that these recovering species would be more nutritious compared to those that persisted.

Hence, in our second study we compared leaf properties of seven focal species that occurred only, or were present in much greater abundance, in the absence of grazing to those of nine common species that were common in both grazed and ungrazed vegetation. Each sample was analysed for macro-nutrients, micro-nutrients, digestibility, palatability and decomposability. An example of our results are shown in Figure 1. Here the focal species, the cloudberry (*Rubus chamaemorus*) has a much greater digestibility on all measures except lignin concentration compared to the

mean value of a range of common species that tolerate sheep grazing. We also measured changes in abundance of the focal species through time.

Our results support the ‘Wet Desert’ hypothesis, i.e. that long-term sheep grazing has selectively removed/reduced species like our focal ones, and on recovery they were more nutritious (macro-nutrients, a few micro-nutrients) palatable, digestible and decomposable than common species. Measured changes in abundance of the focal species suggest that recovery of these species will take 10-20 years in blanket bog and 60 years in high-altitude grasslands. Collectively, these results suggest that sheep grazing has brought about biotic homogenization and its removal in (re)wilding schemes will reverse this process eventually! The headage payments era has taken its toll in the Highlands/uplands, and it will take some time for recovery.

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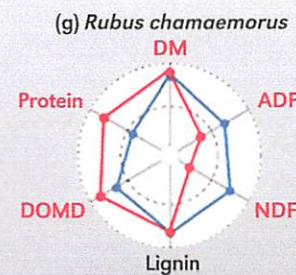


Figure 1. Comparison of a range of variables that indicate how digestible species are between *Rubus chamaemorus* (red), a species that increases when sheep-grazing is removed and the mean value of species that tolerate sheep-grazing. Note that *Rubus* has greater levels of dry matter, protein and DOMD (energy) and lower concentrations of fibre (ADF, NDF); only lignin concentration was not significantly different here.

