Conservation management in Europe is often geared towards restoring semi-natural ecosystems, where the objective is to reverse succession and re-establish early-successional communities, to comply with national and international conservation targets. At the same time, it is increasingly recognised that ecosystems provide services that contribute to other, possibly conflicting policy requirements. Few attempts have been made to define these conflicts. Here, we assess some potential conflicts using a *Calluna vulgaris*-dominated moorland invaded by bracken (*Pteridium aquilinum*) as a model system, where the current policy is to reverse this process and restore moorland. We examined impacts of bracken control treatments on services (stocks and losses of C and mineral nutrients), litter turnover and biodiversity within a designed experiment over 7 years. Bracken litter was >2000 g m^{-2} in untreated plots, and treatments reduced this quantity, and its element content, to varying degrees. Cutting twice per year was the most successful treatment in reducing bracken litter and its element content, increasing litter turnover, and increasing both mass and diversity of non-bracken vegetation. Diversity was greatest where bracken litter had been reduced, but species composition was also influenced by light sheep grazing. There was a significant loss of some chemical elements from bracken that could not be accounted for in other pools, and hence potentially lost from the system. In absolute terms large amounts of C and N were lost, but when expressed as a percentage of the total amount in the system, Mg was potentially more important with losses of almost a third of the Mg in the surface soil-vegetation system.

There is, therefore, a potential dilemma between controlling a mid-successional invasive species for conservation policy objectives, especially when that species has evolved to sequester nutrients, and the negative effect of increasing environmental costs in terms of carbon accounting required, the potential input of nutrients to aquatic systems, and long-term nutrient loss. There is, therefore, a need to balance conservation goals against potential damage to biogeochemical structure and function.

Keywords

Moorland; Model systems; Litter turnover; Nutrient compartmentation; Decomposition; Restoration; Land management; Carbon stocks; Kyoto; Water Framework Directive