



Conserving Natural Heritage

The impacts of woodland colonisation into moorland

Alison Hester¹, Rob Brooker^{1,2}, Graham Osler¹, Colin Campbell¹ Ruth Mitchell² et al
Email: a.hester@macaulay.ac.uk ¹The Macaulay Institute, Aberdeen, ²NERC Centre for Ecology and Hydrology

What are the implications of increasing woodland cover?

Semi-natural woodland cover is currently critically low (3–4% land area) and expansion is actively encouraged through grant-aid and international/national biodiversity Directives (e.g. Scottish Biodiversity Strategy).

However, expansion necessarily leads to losses of other habitats (e.g. moorland – also internationally important) so the process needs to be carefully managed to balance the impacts of projected losses and gains in different areas – this is particularly important in view of predicted changes in climate and land use (e.g. CAP reform).



Natural birch and pine

Combining long-term studies with new experiments

We are combining research on birch sites set up in 1970s (by CEH) with new short- and long-term experiments on both birch and pine.

We are manipulating grazing, N inputs, tree grouping and other factors to explore how different components of the system change and interact as trees establish in moorland, how above- and below-ground biodiversity change at different stages of establishment.

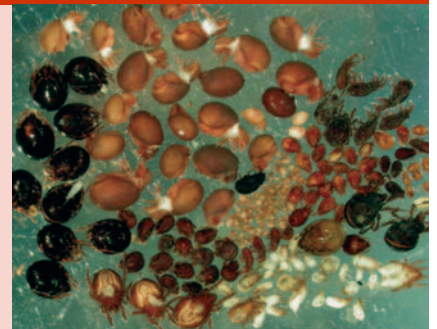


Field work at a study site

Key questions

To understand the implications of woodland colonisation for biodiversity and ecosystem function, we need to:

- Identify associations between above and below-ground biodiversity and their roles in (e.g. carbon flux, decomposition, N mineralisation) at different successional stages
- Establish how grazing, changes in soil nutrients and other perturbations (e.g. temperature) affect these biodiversity changes
- Consider biodiversity losses and gains if moorland is replaced with birch or pine woodland and the implications for protection and conservation of all these important habitats



Some soil animals (40 x magnification)

What have we found so far?

New information on the processes driving change and the complex links between different components of the system, for example:

- Tree colonisation causes changes in vegetation and wildlife, but also causes changes below ground – all have feedback effects on the vegetation
- Some soil animal groups increase in diversity from moorland to woodland, some individual species persist in both vegetation types – all play different roles which are important for ecosystem functioning
- Grazing is known to have major effects on vegetation – e.g. heavy grazing can lead to grass-dominance and shrub reduction – grazing impacts have important knock-on effects on soils as well as wildlife



Peaty podzol profile