

9. Moorlands

Lorna Dawson¹, Jane Lund¹, Alison Hester¹ and Liz Crisp²
¹The James Hutton Institute, ²St Margaret’s School for Girls, Aberdeen
Email: lorna.dawson@hutton.ac.uk

Ecosystem Development

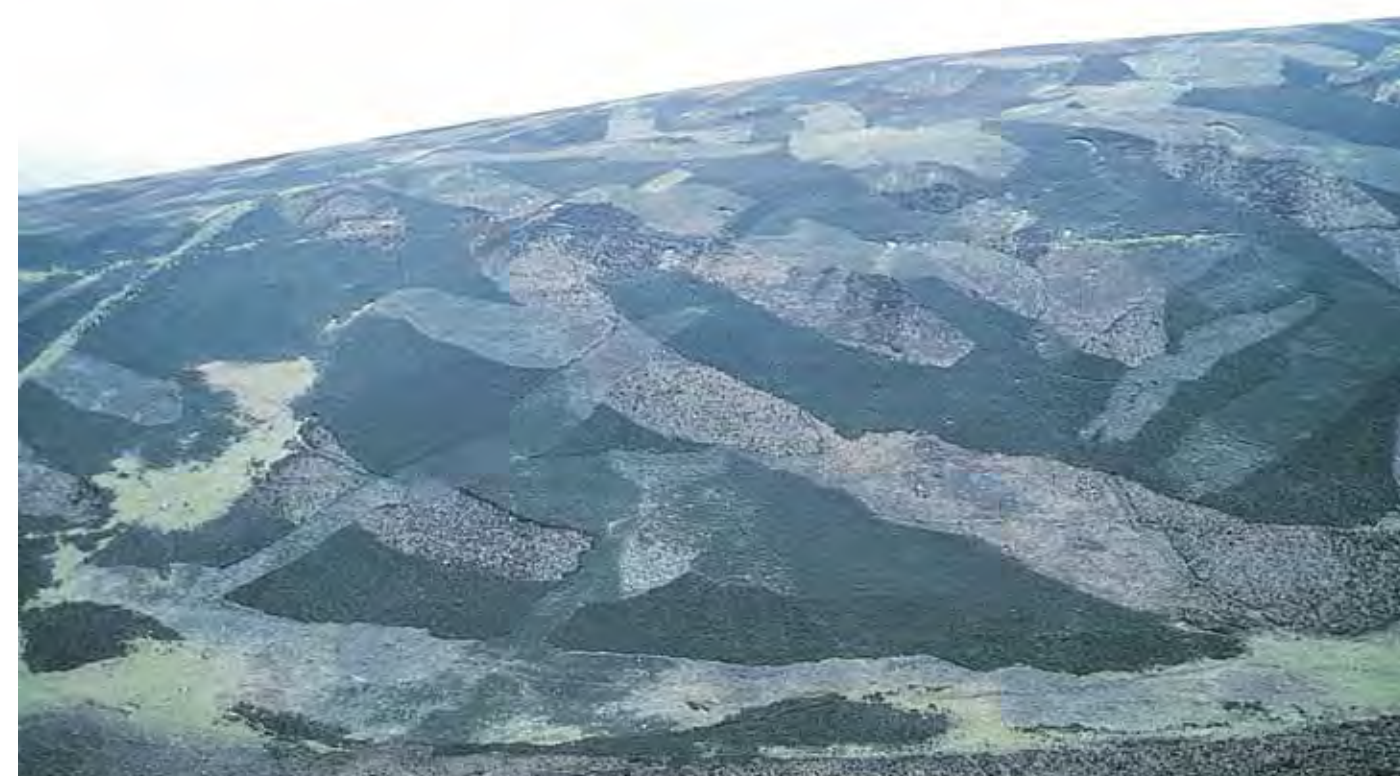
Communities develop as **ecosystems** in response to many factors, including man’s influence. Ecosystems develop through stages, from **pioneer**, e.g. moss, to ultimately the **climax** stage, e.g woodland. Over time, much forest has given way to heather moorland in the UK. A combination of tree felling, burning and grazing has resulted in removal of extensive stands of Scots pine, oak and birch from the Scottish woodlands. Heather management has involved two main tools: grazing and heather burning.

Grazing







Prevents natural regeneration of trees. Damage by deer and sheep, if unrestricted, can prevent young saplings from growing into trees. Heather provides good nutrition for sheep, red deer, cattle and red grouse.



Heather Burning (muirburn)



Periodic burning of heather helps create young nutritious growth for grazing animals, particularly red grouse, while creating in the older taller heather an environment suitable for nesting and cover for birds. Red grouse originally occupied the Scots pine and birchwoods and have adapted to the open moorland ecosystem (like the red deer). Grouse depend on the green heather shoots, buds and seeds for most of their diet. They also eat other plants from the moorland community (bell heather, sheep’s fescue, blaeberry and midges for protein). Careful burning creates a heather ecosystem with a mix of different ages of heather, which has four growth stages: pioneer; building; mature; degenerative.

pioneer	Building ~ 15 years	Mature ~ 25 years	Degenerate ~ 30 years	Scrub woodland ecosystem	Climax Scots pine and birch woodland
					
Moss and lichen Small green	Heather shoots	Heather is dominant but becoming woody	Wavy hair grass and blueberry invade the degenerating heather	Grass, shrubs and trees start to invade heather	Scots pine and birch

Through the use of grazing and burning heather remains the plagioclimax community, preventing the climax stage, Scots pine and birch woodland, from establishing. From around 1950 the extent of heather and the numbers of grouse have declined as a result of several factors including reclamation of low-lying land, reforestation by commercial forestry, overgrazing by sheep and deer, poor muirburn, soil erosion, increased grouse diseases, increased protection of birds of prey and increased incidence of heather beetle. Outbreaks of the heather beetle, which feed on heather shoots in spring, have occurred regularly in poorly drained heather moor for over 150 years.



Glossary

CLIMAX STAGE: taller plants and more complex plants can grow. Plants from earlier stages die out because of competition for light and water
ECOSYSTEM: a unit which links living organisms (plants, animals and people), with each other and their physical environment (rock, soil, air and water)
EQUILIBRIUM: when a vegetation community is relatively stable and self sustaining
MUIRBURN: burning to manage the structure of heather as a habitat for grouse
NICHES: status of an organism within its environment and community

PIONEER STAGE: the first species to colonise a new environment
PLAGIOCLIMAX: a stable plant community that has arisen as a result of human intervention in the natural succession of communities
PLANT SUCCESSION/SERE: sequence of plant communities inhabiting the same site through time
RECLAMATION: modification of land to a “usable” condition
REFORESTATION: re-establishment of a forest environment