BROWSING AND THE REGENERATION OF ATLANTIC OAKWOODS

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Natural Environment Research Council

Note the absence of large saplings

The Issue

Atlantic oakwoods are designated as a habitat of community importance within the European Union.

Despite the large number of small saplings in the field-layer, the woods are not regenerating.

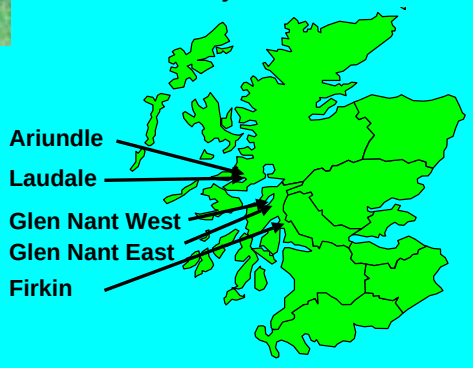
Excessive browsing by ungulates is thought to be one of the problems.

Typical saplings were < 15cm tall

Aims

- Identify factors effecting growth of oak, hazel, birch and rowan saplings.
- Relate browsing of saplings to use of the sites by ungulates.
- Predict the levels of ungulate use that will allow the regeneration of the woods.

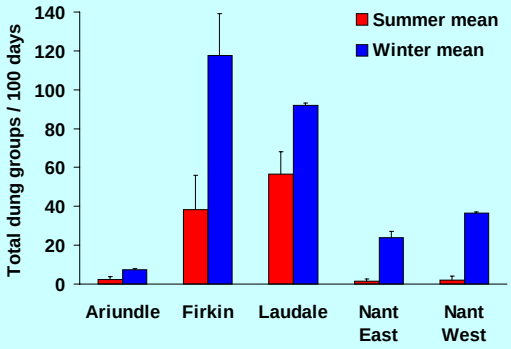
Location of study sites in western Scotland



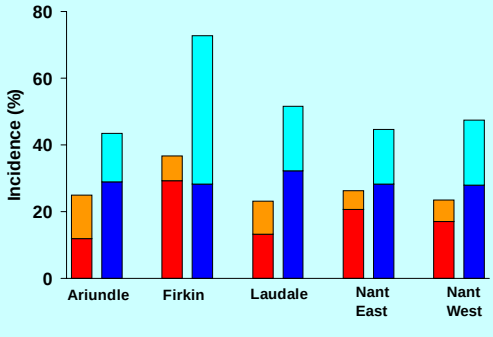
Methods

- 15 plots (4m x 20m) at each site.
- On each plot the dung of red deer, roe deer and sheep was counted and cleared 5 times a year.
- For each sapling on the plot, height and browsing damage were recorded 3 times during the growing season for 3 years.

Seasonal Dung Counts



Oak browsing



- More oaks were browsed in winter than in summer, and higher proportions of saplings were lost in winter.
- A similar pattern was observed for the other tree species.

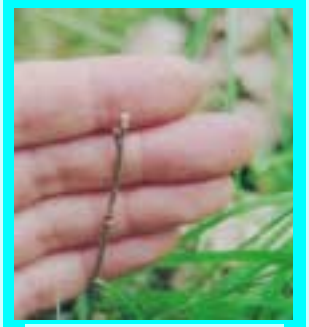
Summer lost - assumed browsed
Summer browsed but still present
→ Maximum summer browsing

Winter lost - assumed browsed
Winter browsed but still present
→ Maximum winter browsing

Browsing and ungulate use

Analysis of ungulate use (as estimated by dung counts) and browsing showed that:

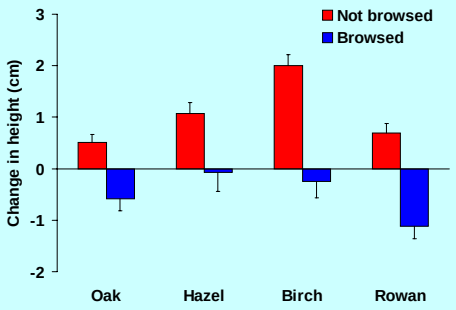
- In summer, the browsing incidence varied between tree species (highest for rowan, lowest for oak), but in winter, saplings were browsed at random as ungulates grazed the field layer.
- There was no relationship between ungulate use and browsing in summer. In winter, browsing incidence increased with ungulate use, but the relationship was weak.



A browsed oak sapling

Sapling growth

- Saplings were unable to compensate for browsing.
- Unbrowsed saplings grew very slowly, typically less than 1cm a year.
- Lack of growth may be due to lack of light.



Conclusions

- Ungulate dung was not generally a good indicator of the likelihood of saplings being browsed.
- 40 - 80% of saplings were browsed/lost each winter.
- Browsing reduced sapling height.
- Even unbrowsed saplings grew very slowly.
- The abundance of oak saplings within oakwood stands suggested that these stands could regenerate given suitable management.
- The lack of oak saplings beyond existing oak stands suggests that the expansion of oak-dominated woodland will be a long-term process.

Management principles

- Whilst browsing by deer and sheep is important, it is unlikely that this alone is preventing natural regeneration of Atlantic oakwoods.
- Management of existing woodland to create clearings and allow more light to reach saplings may be necessary to enhance regeneration and diversify woodland age class structure.
- The expansion of fragmented oak-dominated stands and re-establishment of connectivity between stands may require bracken control and planting or direct seeding.

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