

---

# *Yarncliff Wood at Hathersage: initial assessment of the impacts of sixty years of sheep enclosure on an upland Pennine ancient wood*

Ondřej Vild<sup>1,2,3</sup> & Ian D. Rotherham<sup>3</sup>

<sup>1</sup> Institute of Botany, Department of Vegetation Ecology, Academy of Sciences of the Czech Republic, Lidická 25/27, Brno, 603 00, Czech Republic.

<sup>2</sup> Masaryk University, Department of Botany and Zoology, Kotlářská 2, Brno, 611 37, Czech Republic.

<sup>3</sup> Sheffield Hallam University, Faculty of Development & Society, Pond Street, Sheffield S1 1WB, United Kingdom

---

## **Introduction**

Yarncliff Wood (or Padley Gorge) is located 53°18' N, 1°37' W, south-west of Sheffield and on the eastern edge of the Derbyshire Peak District in the UK. It is a southeast facing, upland ancient wood, dominated by oak (*Quercus petraea* agg.). At the end of the 1970s, there had been almost no tree regeneration at least since 1852 (Pigott, 1983). To find out if the regeneration was blocked by extreme climatic conditions or sheep grazing, a fence (1.12 ha) was constructed in 1955 to exclude sheep. Since then, the site has been surveyed several times (Jarvis, 1960; Earvey, 1977; Anderson, 1978; Pigott, 1983). In particular, Donald Pigott carried out detailed site surveys with students from the Department of Botany at the University of Sheffield, and then re-surveyed the site following a period of exclusion of grazing. This was written up and presented in Pigott (1983), and was a uniquely important

contribution to the understanding of the ecological dynamics of upland oakwood ecology in Britain.

Moreover, following concerns over the adverse impacts of intensive sheep grazing on Peak District upland oakwoods, expressed by the Peak Park Wildlife Advisory Group, a larger area of the wood was enclosed to exclude sheep in the early 1980s. In both the smaller original enclosure, and in the larger and later enclosure, a significant vegetation change was observed. This change included vigorous tree and shrub regeneration and the re-appearance of 'ancient woodland indicators' and other herbaceous plants in the ground flora. These observations supported the suggestion of the significance of former sheep grazing. However, no systematic survey has been done since 1981. Penny Anderson described the ecology and vegetation of these woods in Anderson & Shimwell (1981) and this is a good starting point in understanding the ecology and management of these acidic upland oakwoods.

This present study aims to describe the situation as it has established in the past three decades. Furthermore, the ongoing work will place the Yarncliff Wood study into the emerging context of 'Shadow Woods' and of historic woodland management as highlighted by the *Woodland Heritage Manual* (2008).

## Field survey

Altogether twenty-four plots (twelve, five and seven in the old enclosure, new enclosure and outside, respectively) were placed randomly within the study area. The plots were squares of 100-metre quadrats, where all vascular plant species were recorded and tree seedlings (below sixty cm) counted. Tree composition was studied in a smaller area (0.34 ha) within the old enclosure. These data were compared with the previous research of Pigott (1983). Two age categories were distinguished: (a) individuals younger ('seedlings') and (b) older than one year ('saplings' and 'trees'). Additionally, to indicate the age distribution of regenerating trees, height and girth 0.3 m above ground of all individuals (of girth < 500 cm and higher than sixty cm) were measured. In addition, individuals of a greater girth not recorded in 1981 were included.

## Results and Discussion

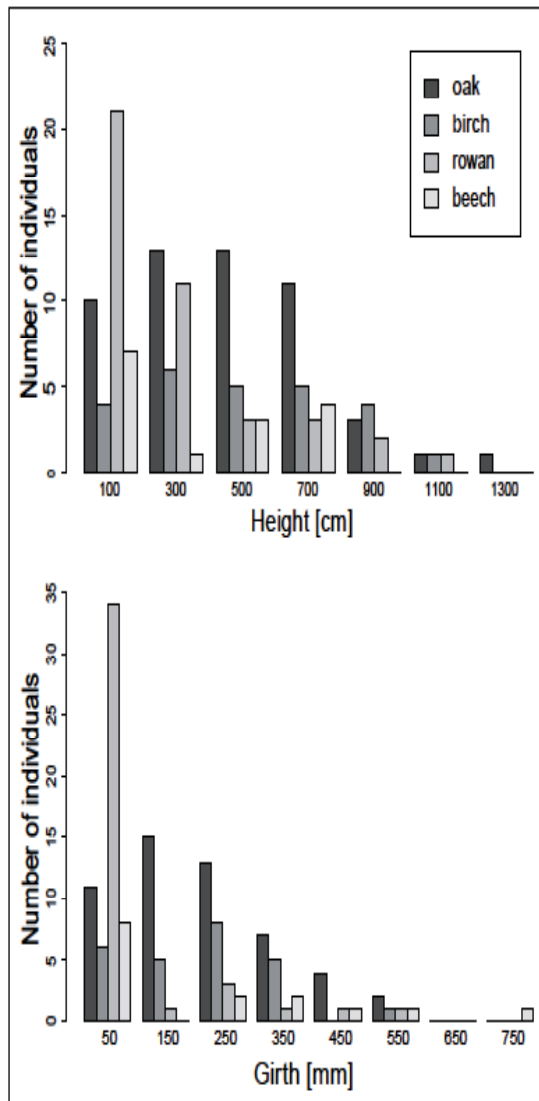
The unenclosed part of the wood was characterised by the presence of species of open areas and disturbed stands (*Poa annua*, *Rumex acetosella*, *Galium saxatile*, *Luzula campestris* and *Rubus fruticosus*). Both old and new

enclosures were dominated by *Vaccinium myrtillus* and *Dryopteris dilatata* and had distinctive woodland species such as *Carex pilulifera* and *Oxalis acetosella*. Climbing corydalis (*Corydalis claviculata*), greater stitchwort (*Stellaria holosteoides*), and bluebell (*Hyacinthoides non-scripta*), are all woodland indicator plants that have increased markedly since the 1980s enclosure. Whilst the two latter has not been found in the old enclosure area during the survey of the summer of 2011, they have been observed in the wood in areas from which they were previously absent, including parts of the 1980s enclosure. There was almost no difference between the old and new enclosures in terms of the plant species composition. In the new enclosure, there was a higher frequency of non-woodland or open woodland species: *Agrostis capilaris*, *Galium saxatile*, *Pteridium aquilinum*, which are probably a remnant of previous conditions and will probably reduce or disappear as the canopy closes.

The number of birch seedlings declined markedly over the period, whereas the numbers of oak, rowan and beech seedlings increased (Table 1). The inability of birch to germinate in shady conditions under a thick layer of litter was noted previously (Pigott, 1983). An obvious increase of both rowan and beech is probably related either to either or both, improving soil conditions or maturation of young trees in the area. The older trees may be producing a higher seed input than was happening under the earlier conditions. A distribution of height and girth values

**Table 1: Number of individuals of four most abundant species found in 1981 and 2011.**

	1981		2011	
	Seedlings	Saplings & Trees	Seedlings	Saplings & Trees
Oak	35	111	91	103
Birch	88	70	17	50
Rowan	8	11	45	47
Beech	3	4	74	15



**Figure 1: Histogram of distribution of height and girth values of selected tree species.**

(Figure 1), demonstrates a gradual change in the tree species composition towards a more extensive admixture of rowan and beech and a slight decline of oak and birch.

Pigott, C.D. (1983) Regeneration of oak-birch woodland following exclusion of sheep. *Journal of Ecology*, **71**, 629–646.

## Conclusions

Species composition of herbs in the enclosure is very stable. However, there is a strong difference between fenced and unfenced area of the wood as reported previously (Pigott, 1983; Anderson, 1978; Earvey, 1977). A gradual change in tree species composition from declining dominants of oak and birch towards increase of rowan and beech was observed.

## References

Anderson, P. (1978) The Longshaw Estate, Hathersage. Ecological Survey. Unpublished technical report to the Peak Park Joint Planning Board and the National Trust, Aldern House, Bakewell.

Anderson, P. and Shimwell, D. (1981) *Wild Flowers and other Plants of the Peak District*. Moorland Publishing Co. Ltd., Ashbourne.

Jarvis, P.G. (1960) Growth and Regeneration of *Quercus petraea* (Matt.) Liebl. in the Sheffield Region. Unpublished Ph.D. Thesis, University of Sheffield, Sheffield.

Earvey, S. (1977) A preliminary study of site management at Padley Wood. Source unknown.