

Does Brexit Provide An Opportunity For The Welsh Government To Deliver Its Sustainability Goals Through Land-Use Change From Livestock Grazing To Broadleaf Woodland? A Case Study

Summary of a dissertation submitted in partial fulfilment of the requirements for the degree of Master of Science (MSc) in Forestry, Bangor University

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Study context and aims

The mixed broadleaf woodland at Bron Haul was planted as an intimate mixture in the 1990s on land previously used to graze sheep. It has been managed for multiple objectives including biodiversity, landscape, shelterbelt, carbon sequestration and for the production of high-quality timber. It was planted and managed with support from government grant schemes and has received awards for the quality of its management from the RFS and RWAS, most recently winning the RFS Best of the Best for Small and Farm Woodland 2022.

This land-use change from livestock to woodland is in line with the Welsh Government (WG) sustainability goals laid out in the Wellbeing of Future Generations (Wales) Act 2015. As Wales faces Brexit and is released from Common Agricultural Policy (CAP) rules, it is consulting on how payments to land managers should be redirected toward achieving its sustainability goals.

Bron Haul woodland is used here as a case study to quantify:

1. the cost to the public purse of effecting land-use change favouring woodland over ruminant livestock agriculture
2. the carbon benefits of replacing ruminant agriculture with well-managed mixed broadleaf woodland
3. the timber provisioning potential of appropriately managed mixed broadleaf woodland

1. The cost to the public purse of effecting land-use change favouring woodland over ruminant livestock agriculture

Woodland has been funded by replacing agricultural support (that makes no financial demand on land managers), with woodland grants (that are mostly a contribution to real costs). CAP payments have been a barrier to land-use change.

Bron Haul has received £111,469 over 23 years to support tree planting and establishment, two cycles of management operations and to compensate for livestock exclusion. Using IBERS Farm Survey data, it was estimated that £96,603 of agricultural subsidy would have been received on this land if it had remained as sheep grazing receiving support under CAP. The afforestation of land at Bron Haul has so far cost the WG little more than would have been spent on agricultural payments (figure 1).

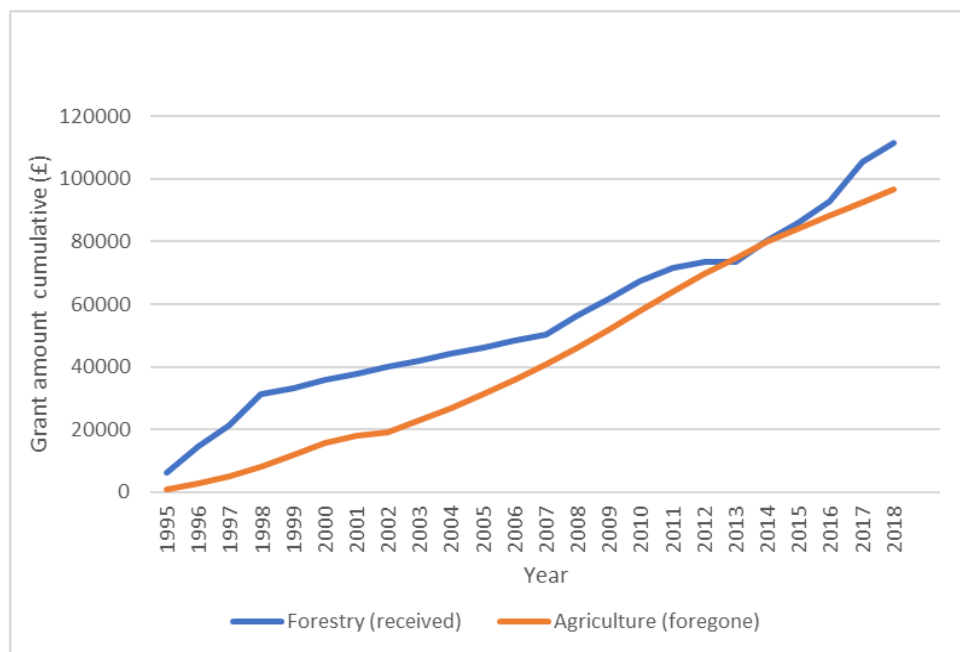


Figure 1 Comparison of cumulative government support for woodland creation and management at Bron Haul compared to estimated agricultural subsidy that the land would have received if it had continued as sheep grazing

It should be noted that Bron Haul was lucky to receive generous funding under Glastir Woodland Management until 2018. This scheme was open for only a short time, and without it, the cumulative woodland grant income would have frozen in 2013 at £73,590.

2. The carbon benefits of replacing ruminant agriculture with well-managed mixed broadleaf woodland

Land-use change from livestock to woodland has provided greenhouse gas (GHG) benefits through carbon sequestration as well as by removing GHG emissions associated with livestock production.

Using the Forestry Commission’s Carbon Assessment Protocol (Jenkins et al, 2018), the carbon currently sequestered in the woodland is estimated at 206.6tCO₂e/ha. This is in addition to the carbon sequestered in thinnings, increased soil carbon and the displacement of greenhouse gases associated with livestock production. Using data from scientific literature, estimates of these additional carbon benefits of replacing livestock with woodland are summarised in the table below.

GHG benefits of afforestation		tCO ₂ e/ha/yr
Carbon sequestered by woodland	Embodied in plant biomass	9.21
	In harvested timber	1.75
	In soil carbon	0.74
Displaced agricultural emissions	Methane from enteric digestion	1.63
	N ₂ O from fertiliser and animal waste application to soil	Not quantified in this study, but considerable
Total		13.33

3. The timber provisioning potential of appropriately managed mixed broadleaf woodland

Broadleaf woodland managed under continuous cover forestry (CCF) can produce a continuous high-quality timber resource. There is evidence from French research that once established CCF woodland is economically viable, as well as delivering a variety of public goods.

Providing that the current high-quality woodland management at Bron Haul continues, the harvesting of the first saw logs, suitable for enduring end use, is predicted to commence 34 years after planting. From then on, the woodland should yield regular income from high quality timber grown under a continuous cover management regime, realising the WG vision for resilient, genuinely multi-purpose woodland (Figure 2).

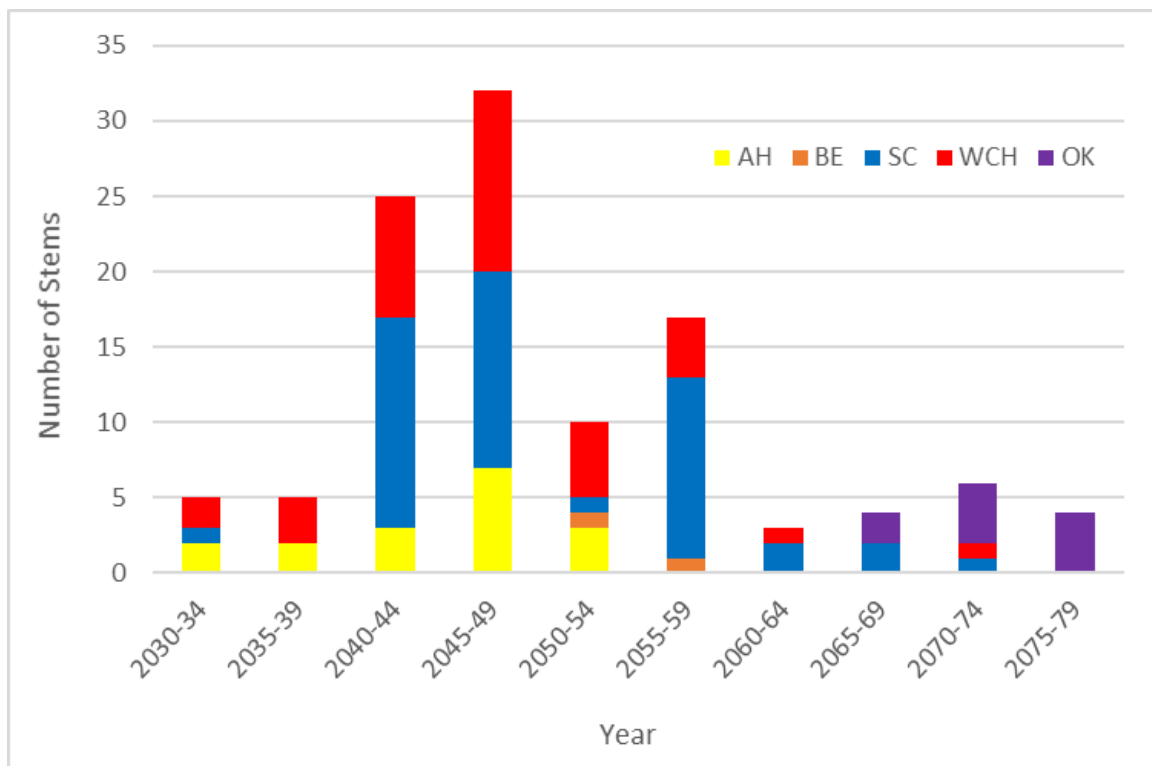


Figure 2 Estimated harvesting years for timber stems from 1.2ha of broadleaf woodland planted in 1996

This has been achieved through;

- Planting an intimate mix of site suitable species
- Formative and high pruning of many stems
- Timely and frequent thinning
- Rigorous control of grey squirrels

Note that the decline in timber forecast from 2050 will not be reflected in reality. Through more even distribution of when stems are actually harvested (not necessarily being as soon as they reach a target DBH) and the recruitment of natural regeneration into the canopy will result in a consistent harvest once the woodland is in equilibrium and CCF is fully established.

CCF using predominantly broadleaf, site native species is well established in France, where the Association Futaie Irreguliere (AFI), founded in 1990, have established permanent reference plots in a network of over 80 research woodlands. Their strategies and outcomes, including evidence for the economic viability of irregular forestry once it is fully converted to CCF are documented (Susse et al. 2011). This network is slowly extending into the UK through SelectFor, who provide training in CCF conversion and monitoring practices as informed by the AFI.

Damage to young trees by grey squirrels and deer as well as browsing of natural regeneration by deer remain the main threats to broadleaf woodland and their successful control needs to be a priority to make this sustainable approach to productive woodland silviculture mainstream.

References

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Susse R., Allegrini, Ch., Bruciamacchie, M. & Burrus, R. (2011). *Management of Irregular Forests*. Besançon: Association Futaie Irrégulière. (English translation by Phil Morgan).

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