

Written evidence submitted by Owen Williams, Wildlife Artist, farmer/land owner and conservationist, and Director, Amlwg Ltd (HIL0001)

I am submitting my evidence to your inquiry as a partner in a family hill farm in Ceredigion. I am a keen conservationist and our farm business is about to embark on work to improve the biodiversity on our 160 acre farm. This will add to habitat work already done and will include planting native hardwoods with the emphasis on connectivity rather than planting trees in order to sequester carbon.

There is much talk these days of planting trees on upland pastures as global warming 'quick fix', however having read the science on trees and carbon sequestration I strongly feel there has been insufficient scrutiny of all the available science. It is over simplistic to suggest widespread planting of trees on farmland will achieve the results we desire. The latest science strongly enforces the oft repeated mantra 'the right tree in the right place', however this is often not reflected in policy statements that talk glowingly about planting millions of trees across our landscape to save the planet, with little consideration for farming resilience, food security and the impact on the rural economy when taking so much land out of the production. My view is shared by several ecologists who work on the ground and are aware of the realities of life farming in LFA's in areas such as upland Wales.

There is good evidence pointing out doubts about the efficacy of tree planting as a means of locking up carbon. For example research by Upson, Burgess and Morrison 2016 ⁽¹⁾ show us that 14 years after planting native hardwood trees on pasture Soil Organic Carbon (SOC) fell from 6% to 4.6%. This represented 37% of the carbon stored in the grown biomass. However, this biomass, having low commercial value as compared to commercial softwoods will eventually die and in doing so will return much of the stored carbon to the atmosphere along with methane as a result of decomposition. This gives limited net gain in terms of long term carbon sequestration.

The key to the effective use of forest as mitigation against climate change lies in how we use the biomass in which the carbon is stored. Commercial forestry in which fast growing softwoods are used as building materials locks up stored carbon until demolition and eventual disposal of building timber through burning or decomposition this can undo most of the good gained. A similar problem exists with softwoods used for fencing products where the posts eventually need replacing and old posts are not recycled and instead burned or left to decompose. In addition, the level of waste in harvesting softwoods (stumps and brash) which is left to decompose must be considered in the overall carbon budget of commercial forestry. This is before the negative biodiversity effects of commercial forestry are considered, the biodiversity impact of planting large swathes of our upland with commercial soft woods has long been documented.

Research published by Nina Friggens of the University of Stirling in 2020 ⁽²⁾ studied the carbon effects of planting trees in peat-based soils in various setting across Scotland. This 40 years study showed that on plots where trees were planted soil lost significant amounts of stored carbon through drying and oxidation and that this deficit was only balanced by above ground biomass after 39 years. The conclusion being that planting trees on many upland sites gives limited carbon sequestration gains.

So it is becoming clear that tree planting to mitigate against climate change is far more nuanced than current policy making would suggest. Too little consideration has been given to the alternative of locking up more carbon in pastoral soils through regenerative livestock grazing and management. It is widely accepted that much of our soils are in poor condition which suggests the potential to lock up more carbon if we improve management. A recent small study I conducted over 6 farms in West Wales in which I took 100 samples on livestock grazed pastures showed that soil carbon varied from a low of 3.8% to a high of 11.3%, this hints at the potential for significant improvement.

There are serious negative economic, social and cultural impacts of taking large areas of upland Wales out of food production through tree planting. Although new native hardwood plantations will require some management this will provide limited employing opportunities for future generations. This will undoubtedly lead to depopulation of young people from our farmed landscape seeking better opportunities elsewhere. The knock-on effect will be the inflation of rural property prices as wealthy people buy up vacant farmhouses pricing those young people who decide to remain in the countryside out of the property market. There will be impact on local schools as demographics change from young families to older resident who have the wealth to buy up vacated properties, in turn will adversely affect the Welsh language and culture.

Farming in Wales is going through a tough time due to Brexit and the phasing out of subsidies. Large companies are already buying farms in Wales in order to plant trees on agricultural land as a way of offsetting their dirty use of carbon. This is a false prospectus because they are manipulating the organic carbon cycle (which is circular) so that they are excused adding CO₂ and methane to that cycle by dangerously unlocking carbon that has been stored in fossil fuels for millions of years. Furthermore these companies care little for local communities, the Welsh language, and culture, their tick box approach to carbon offset gives them no reason to contribute to our rural communities. In addition to offsetting carbon they also hold an asset which should be owned by local people not shareholders sitting comfortably away from the day to day pressure of making an honest and sustainable living from the land.

Government needs to offer hope to the farming community in Wales that there is a viable future business model of food production, management for public goods, and carbon sequestration. The reversal in the decline of farmland biodiversity is achievable without sacrificing farming resilience, many farmers are already embracing regenerative livestock management practices and Welsh Government funded 'Sustainable Management Schemes' are providing blue-prints for a sustainable future in farming. The potential for farmers to trade their carbon capture offers a way to compensate for income foregone in improving biodiversity without impacting the hard pressed public purse

We must not forget that despite being a managed landscape grazed pastures are not inherently bad for biodiversity. Our farm has areas of mountain pansy that are there purely due to sheep grazing reducing competition from other plants. Our grazed pastures provide winter feeding for species such as woodcock which are the most numerous wader in Wales. Having arrived here in autumn from their breeding grounds in Russia they survive on a night

time diet of earthworms that are plentiful due to current grazing regimes. Golden Plover and snipe on passage in autumn also use these pastures as stop over on their migration.

The narrative that sheep are bad for the environment is only true with regards to over stocking and over grazing, policy should be encouraging mixed farming with the return of cattle that are effective in breaking down *Molinia* and rushes in wet areas which gives breeding and feeding habitat for species such as snipe. Cow dung on the ground will bring back the insects that are vital feed for lapwing and curlew chicks in their first few weeks after hatching. When used properly cattle can play a significant role in increasing soil organic matter and thus increase soil carbon in pastures.

Of course planting trees for biodiversity is a laudable goal as it introduces different assemblages to the landscape, however this must be done in a balanced way so we don't lose other species as a result. There is good published science showing that increasing woodland provides more habitat and cover for predators. It is also known that this will adversely impact on ground nesting species such as the curlew, a species identified as a major conservation priority by Welsh Government and all conservation bodies. Reducing the availability of pastures through tree plant and at the same time increasing predator pressure will make this task of restoring curlew in our farmed landscape almost impossible.

Wales has a golden opportunity to show the way forwards to a more sustainable farming future that also delivers greater biodiversity to our landscape, however this will not be achieved unless policy is informed by a full and proper examination of all the science and we avoid the trap of simplistic quick fix solutions. This is what we are hoping to achieve on our hill farm in the future.

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1. <https://www.sciencedirect.com/science/article/abs/pii/S0016706116302865>
2. <https://www.nature.com/articles/s41586-018-0577-1>