

# Bigger, Better Forests



Benedict McAleenan

Foreword by John Humphrys





---

# Bigger, Better Forests

Benedict McAleenan

Foreword by John Humphrys



---

Policy Exchange is the UK's leading think tank. We are an independent, non-partisan educational charity whose mission is to develop and promote new policy ideas that will deliver better public services, a stronger society and a more dynamic economy.

Policy Exchange is committed to an evidence-based approach to policy development and retains copyright and full editorial control over all its written research. We work in partnership with academics and other experts and commission major studies involving thorough empirical research of alternative policy outcomes. We believe that the policy experience of other countries offers important lessons for government in the UK. We also believe that government has much to learn from business and the voluntary sector.

Registered charity no: 1096300.

**Trustees**

Diana Berry, Alexander Downer, Pamela Dow, Andrew Feldman, Candida Gertler, Patricia Hodgson, Greta Jones, Edward Lee, Charlotte Metcalf, Roger Orf, Andrew Roberts, George Robinson, Robert Rosenkranz, Peter Wall, Nigel Wright.

## About the Author

**Benedict McAleenan** is a Senior Adviser to Policy Exchange's Energy and Environment Unit. He is a public policy advisor with over 13 years' experience advising on policy development, political risk and thought leadership in the Energy, FMCG, Manufacturing and Engineering sectors. His private sector clients have included National Grid, Centrica Energy, the Renewable Energy Association, Shell, Centrica, Sainsbury's, Endurance Wind Power and Balfour Beatty.

# Acknowledgements

The author is very grateful to the following for lending their expert commentary and feedback to this report: Dr Richard Benwell, Rt Hon Richard Benyon, Dr James Cooper, John Everitt, Sam Hall, Dr Eleanor Harris, Andy Heald, Andy Howard, Martin Glynn, Christiane Lellig, Nick Phillips, Matthew Rivers, the National Farmers' Union and several members of staff at the Forestry Commission, Forestry England, Forest Research, Natural Resources Wales, Forestry and Land Scotland and Scottish Forestry.

© Policy Exchange 2019

Published by  
Policy Exchange, 8 - 10 Great George Street, Westminster, London SW1P 3AE

[www.policyexchange.org.uk](http://www.policyexchange.org.uk)

ISBN: 978-1-913459-03-1

# Contents

About the Author	2
Acknowledgements	3
Foreword	5
Executive Summary	7
Tree-Related Principles for Policy Makers	22
Summary of recommendations	24
UK Woodlands Today	27
Where are we now?	27
Our current planting rates	29
Carbon sequestration in woodlands	32
Harvesting and wood supply chains	33
Demand for UK-grown timber and wood	36
A Short History of Woodland Policy in the UK	39
Policies and aspirations for tree cover	42
Incentives and Regulations in the Woodland Sector	46
EU subsidies	46
Regulation	48
Opportunity Areas for Tree Planting	49
Opportunity area 1: Conservation areas	49
Opportunity area 2: Farms and Agroforestry	52
Upland and hillside farms and moors	56
Unmanaged woodlands	59
Rewarding Value in Trees and Wood	64
Objective 1: Stimulating demand for Harvested Wood Products	67
Objective 2: Reward the Environmental Land Management services provided by living trees.	73
A New Approach in UK Woodland Policy	83
An Integrated Approach to Land Use	84
Stimulating Demand for Living Trees in the Landscape	86
Stimulating Demand for Harvested Tree Products	87
Appendix: Glossary	88

# Foreword

John Humphrys

The nation is on the brink of a revolution. A revolution more glorious by far than that of 1688 and long overdue. The signs are everywhere. The Daily Mail is appealing to its readers to sign up to a new campaign. Broadcasters are telling us to take up arms. Children in schools across the land are venturing forth equipped for battle with saplings and spades. Entire communities are uniting. Political parties are recognising its inevitability and are promising policies that, cometh the hour, will place them alongside the revolutionaries. This is an arboreal revolution.

Like all revolutions its roots lie deep in the soil of our land – in this case both literally and metaphorically. Where my allegory falters a little is there are no opposing forces. We all want to see more trees in our not-sufficiently-green and pleasant land. The scientific case is unanswerable. On the macro scale climate change is a real threat to the planet. The more trees there are to absorb carbon dioxide the greater our prospects of limiting the greenhouse effect. On the micro scale doctors agree that trees have a beneficial effect on those who spend time near them – above all young children whose developing hearts and lungs suffer from the particulates that trees are so effective at absorbing. Quite simply, they clean the air.

So three rousing cheers for all those involved in local tree planting campaigns. But they are not enough. It is wonderfully heart-warming to see gangs of children tramping off to their local parks to inspect the infant trees they are nurturing but for this revolution to succeed it has to mobilise those who can have the greatest effect: the landowners and farmers. And what this report demonstrates so powerfully is that they must do so much more.

When humans decided 10,000 years ago to stop roaming and start farming the first thing they did was chop down trees to clear the land. They kept doing it. By the beginning of the last century we were left with only enough trees to cover a pathetic 5% of the country. There has been a substantial improvement since then but our forests are still only a third of the European average. We would have to plant three times as many as we are managing at present if we are serious about meeting the target set by the Committee on Climate Change of net zero emissions by 2050.

This, sadly, is not going to be achieved by campaigning or exhortation or even by issuing dire warnings that we risk bequeathing our grandchildren a scorched earth. Nor can we leave it to natural forces. I spent a glorious weekend at the Knepp Estate in East Sussex owned by Charlie and Isabella Tree. They took the brave decision almost twenty years ago of handing

their 3,500 acres of farmland back to nature. It is now teeming with biodiversity unimaginable in most of rural England. But it is not a forest.

The brutal reality is that those who own the most land in this country need incentives to grow trees in the numbers that are needed, which is where this report may prove so valuable. As it makes clear, most land managers think forestry is simply not worth the effort.

The report's most eye-catching proposal is a "Forest of Britain": a two-mile wide corridor from Land's End to John O'Groats that would connect conservation sites such as SSI's and nature reserves and, yes, the Knepp project. Its value to diversity would be incalculable but it would be costly. Some of the money needed might come from Environmental Land Management contracts which the government favours when/if we are finally freed from the shackles of the Common Agricultural Policy.

Another important proposal concerns farmland. Or perhaps I should say agricultural desertification. As Charlie and Isabella discovered to their great cost, just because your land can grow corn does not mean it should grow corn. They lost money with every trailer-load forced from the reluctant soil. What this report suggests is not rewilding, but the development of farm woodlands and agroforestry as a central plan of our agricultural policy. Trees can be used to protect soil and grazing livestock from wind and rain. Orchards can be integrated with arable crops so one patch of land produces more food and more profit. And much more public good.

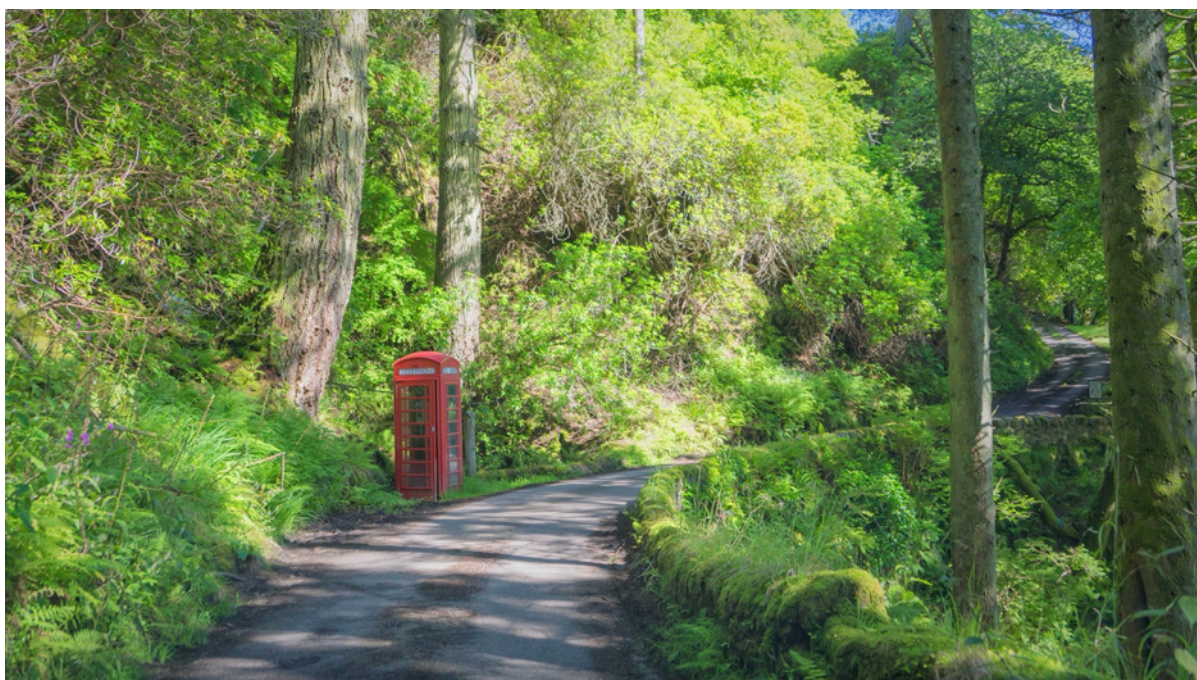
And then there are our neglected woodlands. They are not managed as they should be because the return on the investment does not justify the effort. That's not to say that some woodland should not be left to fend for itself. A healthy wood full of ancient oaks needs no help from puny humans. But not all are healthy. Climate change is lowering the resilience of many woodlands and insufficient vigilance to guard against imported pests leads to the horror of diseases such as ash dieback.

It is not so very long ago that we regarded our home-grown woodland as a great natural resource. We must do so again. We must reduce our dependence on imported timber and give farmers the incentive they need to see their woodland for what it is: a potentially great natural asset.

On reflection, perhaps it is not a revolution that we need. Perhaps it is just the application of a mighty dose of common sense.



## Executive Summary



Increasing tree cover in the UK is a matter of land use policy.

This simple fact is often forgotten amid a rush to re-forest Britain through multiple schemes and interventions. This seemingly overlooks the fact that silviculture – the art and science of growing trees – is just one subset of land management.

In the last 25 years, several government-backed new forests have been established or proposed, from the mid-1990s National Forest to the most recent ‘Northern Forest’, which is to stretch across the North East and North West of England. Though laudable and important (we propose a project of our own in this report), these schemes alone are not sufficient to address more fundamental barriers to tree planting, many of which are the direct results of public subsidies for a particular model of farming.

Trees, both as a source of wood and as providers of valuable services in the landscape, have been sidelined and inadvertently disincentivised. To put it another way, they have been undervalued in the market of land uses. To ensure their proliferation in sufficient numbers to help address climate change and biodiversity loss, public policy must enable market mechanisms that value the full range of products and services that trees offer.

Over many decades and centuries, trees have been crowded out in favour of a form of agricultural land use that has become unnecessarily exclusive, resulting in fewer trees in our landscape. Trees often provide a broader range of public benefits compared with agriculture, which is focused on the production of private goods. This suggests they deserve a greater share of public funding than has been the case.

The UK has a dense population and it was the first economy to industrialise, placing severe pressure on its natural resources. By the turn of the 20<sup>th</sup> century, around 10,000 years of deforestation had led to just 5% tree cover on the British Isles. This has been slowly turned around by the work of the Forestry Commission and extensive support for private forestry, leading to 13.1% tree cover today. Yet this is still very low: the European average is 38%; France and Germany have 31% and 32% respectively.

Although the UK continues to improve its tree cover, it is not doing so quickly enough to address the two urgent environmental threats: climate change and ecological decline. Around 9,000-10,000 hectares are forested throughout the UK each year, mostly in Scotland. In order to meet the proposals of the Committee on Climate Change (CCC), which would deliver the UK's stated target of net zero emissions by 2050, we would need to afforest 30,000-50,000 new hectares per year – an area equivalent to 75,000 football pitches and at least three times the current rate at a minimum. To reverse ecological decline, woodlands must play a central role through ecologically sensitive land use and improving connectivity between ecologically important sites. This means a wide range of goods and services must be rewarded through public or private means.

A final challenge is that of quality, not simply quantity. Carbon sequestration targets with an eye on the 2050 Net Zero target will create a drive towards quantity, which does not always align with other factors such as landscape diversity. In the early years of the Forestry Commission, a policy in favour of softwood timber production created a strong bias towards a particular type of conifer. Various policies have begun to unwind this, not least the UK Forestry Standard, but the effects on tree policy remain. In particular, there is a chasm between those who favour amenity woodland and warn of the 'lessons of the Flow Country' (the serious damage caused to a vast peatland and wetland area in Scotland between the 1950s and 1980s by the planting of non-native conifer forests), and those who see a place for commercial forestry within a diverse landscape. This is a false dichotomy. However, too many targets in the current policy debate focus on carbon sequestration alone in order to reach a 2050 target for net zero carbon emissions. This is likely to lead to distortions. Trees are a very long-term undertaking; hardwoods even more so. The strongly pro-conifer/softwood policy taken in the early 20th century still has repercussions for tree policy now. A better outlook should consider far longer-term issues and ask what type of trees, timber and harvests we want future generations to enjoy.

Policy can and should ensure a diverse, integrated approach to land use policy that accommodates both amenity and commercial forestry (including agroforestry), often on the same parcels of land. Very often tree planting is seen as one thing, but it is actually a broad continuum. Taking the landscape as a whole, commercial forestry can provide the scale needed for carbon sequestration, whilst more amenity or biodiversity-focused woodland can provide more of the ecological range that is a prerequisite

for restoring biodiversity. This is a spectrum, rather than a stark choice, with modern, well designed woodlands offering a mixture of benefits. As with the example of the Forestry Commission, policy decisions made about trees can still be felt decades later. We should therefore consider not only 2050, but 2100 when making today's policy decisions.

This is both a challenge and an opportunity. It is a challenge, because we have a long way to go. It is an opportunity because the only way is up: we are starting from a low base and can achieve a huge amount of tree planting with the right policies and markets in place. There is plenty of land that could be more economically managed if afforested.

To reach these high planting targets, public policy should focus on three objectives:

- 1. Create an integrated land policy.** Agriculture and silviculture must be reintegrated. This approach will help woodlands to be seen as a tool in environmental land management and part of a spectrum of land uses across the full range from intensive agriculture through to rewilded biodiversity projects. At the moment, forestry is seen as separate, alien and risky to many land managers and farmers. Given that most planting and woodland ownership is in the private sector, and over 70% of the UK's land is farmland, private land managers must be supported (or at least not undermined) in their use of trees as an integrated part of the rural economy. Part of this includes creating a more level playing field between agriculture and forestry, in which forestry is not 'crowded out' by subsidies that favour farming above more integrated uses.
- 2. Stimulate a market for trees in the landscape.** Living trees deliver a huge range of valuable services every year of their lifecycles and should be rewarded for these annually. They can be summed up in the three broad categories of carbon sequestration, ecological services and socio-economic benefits. Supporting markets and public money for public goods is a key role for public policy.
- 3. Stimulate the market for harvested tree products.** An individual tree can provide a multifaceted harvest of timber, wood products, biorefinery feedstocks, wood fuel, fruit, sap and nuts. Timber is literally a core part of this, sequestering the most carbon and providing a high-value product. By stimulating demand and facilitating supply of timber and other products, the UK could improve rural economies, reduce imports, protect tree health, cut the emissions of several industries and create incentives to invest in afforestation. Sustainable wood use is a win-win and should be a policy priority.

### Barriers

The fundamental problem in British forestry is that it must compete with other land uses that have become the norm, which are supported by greater public subsidy. The foundation for this, though not the only driver, is the EU's Common Agricultural Policy (CAP) and Common External Tariff (CET). These mechanisms fail to incentivise farm diversity and experimentation, they prop up certain uneconomic land uses and they create a culture in which woodland management is very often seen as separate and alien to agriculture.

Over time, this has opened a knowledge gap and cultural divide between the land management sector (particularly farmers) and the forestry sector, resulting in additional disconnection with the market for wood products. The value chain between wood suppliers and wood users has been broken and market signals are not currently strong enough to bridge the gap. This has also contributed to a lack of public understanding about commercial forestry as a sustainable and desirable practice that leads to more trees, not fewer.

In particular, farmers see woodland management as an extremely long-term endeavour, which it is, but with minimal advantage in the short or medium term. Even though certain forestry business models can turn a very respectable profit over a 35-year rotation, it is poorly matched against the shorter-term cashflow, flexibility and supportive market set-up of traditional agriculture.

At present, the standard commercial woodland involves planting mainly coniferous woodlands with a grant of a few thousand pounds per hectare to cover most costs of establishing an afforestation scheme. It involves the permanent commitment of that land to woodland due to the principle of 'permanence' in forestry policy, which means that woodlands, once planted, may never return to other uses. This creates a barrier for farmers for a range of reasons. The woodland must be designed to comply with the UK Forestry Standard (UKFS), which requires specialist knowledge. If it is a large planting scheme, it will require an Environmental Impact Assessment and will attract the interest of multiple external stakeholders, who may have very different expectations and objectives to those of the landowner. This creates complications and disincentives for the latter. Once established, maintenance funding will usually continue for 10 years, followed by years of no income except from occasional thinnings and then finally a much larger payout for timber after about 35 years. Returns from this final harvest can be £20,000-£30,000 per hectare for quality softwood timber, equivalent to £780-£1,000 per hectare per year over a rotation.

These eventual returns may be appealing, but the model does not obviously fit well into the normal patterns of a British farm. It requires skills, investment and patience lasting decades. Many farms already struggle with year-to-year cashflow and profitability, making multi-decadal forestry rotations unappealing. Many farmers are also tenants, with tenancies far shorter than a woodland rotation, so the farmer will not

see returns on their own investment. Similarly, farm landlords are often unwilling to forego rental income by giving up operational farmland. It is therefore not in the interests of either tenant or landlord to invest in trees.

Instead, farmers can operate traditional business models based on arable or pastoral farming, in which crops or produce can be harvested half-yearly, annually or biannually. They are supported by a Basic Payment under the CAP, tied to the amount of land they farm. Even farmers with uneconomic land uses, such as hillside sheep grazing in the uplands, can scrape by with these subsidies in place. Farmers know where to find machinery and labour, how to maximise outputs and how to supply produce to a ready market. Returns on productive arable or pastureland range from around £300 to £2,000 per hectare.

Furthermore, whilst coniferous woodland managers can find a market relatively easily, the market for UK broadleaf woodlands and the hardwoods they produce is far less developed. The UK imports the vast majority of its hardwood products because it lacks access to enough high-quality, homegrown hardwood timber. If a land manager does decide to plant a patch of land and grows the woodland to maturity, he or she may struggle to find an efficiently functioning market in their region. Expertise, infrastructure, processing mills (especially for hardwoods) and buyers are noticeably absent in some regions of England, Wales and Northern Ireland, after decades of under-planting and under-investment. Many small woodlands exist, but without aggregators to connect them to sawmills and timber merchants, so costs are higher and market signals weaker.

Another challenge to largescale planting is the UK's lack of capacity. Nursery capacity, seed availability and a skilled workforce are all required to plant tens of millions of trees each year. We plainly do not have these at the moment, which means importing more saplings. This raises risks to tree health, which creates risks for land managers and investors.

With all of these factors considered, most land managers and farmers consider forestry to be not worth the effort. 87% of our land is unforested and some areas may even be going backwards in some years. In existing woodlands in parts of the UK (especially hardwoods in England), millions of tonnes of wood currently sit unmanaged and unharvested, maximising neither environmental services nor economic value. As a result, the Southern UK especially has an abundance of under-managed broadleaf woodlands that could deliver far more value in terms of sustainable wood products, carbon sequestration, biodiversity value and human amenity. Conversely, Scotland's conifer-dominant forestry sector leads the UK in both planting rates and market development, with the capacity to ramp up further if given the right policy support.

## Opportunities

Two major changes are already underway that are likely to affect this situation:

- **Brexit:** With the UK leaving the European Union, the CAP will no longer apply. The UK has signalled a new direction for agriculture policy, focused on Environmental Land Management (ELM). ELM contracts will likely provide a source of revenue for woodlands in a range of formats, from flood management and water quality improvements, to preventing soil erosion. The loss of the CAP Basic Payment will also encourage farmers to look for new sources of income. By making more efficient use of certain types of land, forestry offers such opportunities.
- **Climate change and ecological decline:** There is an increasing awareness of environmental crises and a growing political mandate for change. The most obvious example of this is the national target of net zero emissions by 2050, a cross-party consensus based on advice from the Committee on Climate Change (CCC). The CCC's advice, supported more recently by the UN's Intergovernmental Panel on Climate Change (IPCC), is for significant land use change. Specifically, there will need to be a reduction in some land uses that involve high emissions (such as intensive forms of cattle and sheep grazing) and an increase in practices such as forestry and agroforestry, that promote carbon sequestration. This report sets out some options for doing so.

In the UK, there are several opportunity areas for responding to these changes with the greatest impact. In this report, we highlight three leading opportunity areas, although there are many more.

Firstly, conservation projects. The current government is advancing a policy of Nature Recovery Networks, in which conservation sites will be reconnected through local networks of woodlands, hedgerows and other connectors. This presents a major opportunity for afforestation at the policy level, though proper funding will be required to help pay for it. We anticipate this coming from the proposed ELM system, but we also suggest additional measures to support it. A localised policy framework will also be needed to ensure public money achieves genuinely useful outcomes (see Natural Capital Strategies below).

In particular, we propose one national project to raise the profile of Nature Recovery Networks and their importance in ecological restoration. We propose a 'Forest of Britain', a two-mile-wide corridor focused on connecting conservation sites such as local and national nature reserves, Sites of Special Scientific Interest and Ramsar sites (wetlands of international importance), along a route stretching from John O'Groats, via Wales, to Land's End. The project would aim to unite local communities and landowners in a high-profile effort to connect the natural landscapes of mainland Britain. A range of management approaches could be used along its route, including rewilding, proactive conservation management and experimental forestry. A key focus for the project would be investment in footpaths, visitor centres and other infrastructure to support eco-tourism along the route.

The second opportunity area is farmland. In particular, we propose the development of farm woodlands and agroforestry as a central plank of British agricultural policy. Agroforestry involves the use of trees within agricultural systems. For example, trees can be used to protect soil and grazing livestock from wind and rain. Orchards can be integrated with arable crops to optimise land use. With the right mechanisms in place, farms can see commercial forestry and agroforestry as a productivity boost and a new source of revenue whilst also delivering public goods.

In addition to agroforestry, we suggest diversification of upland and hillside farms. Very large areas of upland Britain are used for hillside grazing (particularly sheep) and grouse moors, which requires a unique and controversial form of land management. These practices are likely to come under pressure with the loss of the CAP. Providing incentives, training and support to land managers can help them to transition to new forms of land management, creating an opportunity for rewilding and/or afforestation of large areas that are currently denuded. Trees are not always the right solution in these landscapes but they are very often part of the mix. For example, improper planting of trees on deep peat can dry out uplands, making them unable to store water and exacerbating flooding risks. Conversely, trees in upland mineral soils can help to retain water whilst downstream their roots can slow the flow of rivers, improving flood management.

The final area of opportunity we highlight is in under-managed woodlands. As mentioned above, many woodlands, especially in England and Wales, are under-managed because market signals are not strong enough to incentivise active management. While some woodlands may benefit from the 'hands off' approach, this is not often the case and it is increasingly less true as climate change lowers the resilience of UK woodlands. Improving management regimes can help to protect woodlands from pests and blights (such as ash dieback), maximise carbon sequestration, improve biodiversity and/or maximise economic returns.

In all of these opportunity areas, the forestry and timber sectors can provide many more jobs in the countryside. Using more British wood keeps 'value-added' within the UK and improves our balance of trade. It also protects an increasingly vulnerable stock of woodlands from imported pests and diseases. Finally, by using more UK-grown wood in the UK, we can cut the costs of decarbonisation of our economy, saving potentially billions through a low-regrets, natural solution.

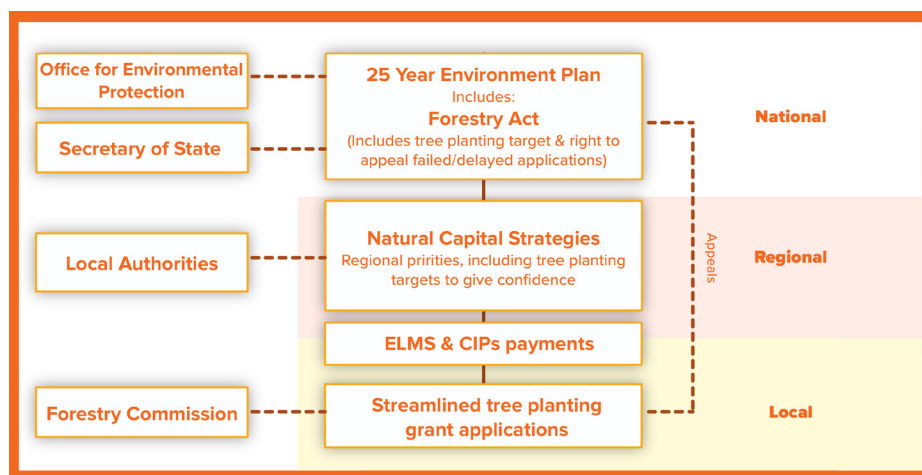
### **How to grow more trees**

Policymakers should seek to (i) improve land use strategy and (ii) stimulate markets for living trees and harvested wood products.

### **Improve land use strategy**

Government is already proposing a shift away from the CAP and towards 'public money for public goods' through the new Environmental Land Management System (ELMS). This might adopt many different mechanisms

for making payments, but the principle remains the same: payments to reward public goods such as better soil, water and air quality, biodiversity improvements, visual amenity, flood management and human enjoyment. However, there is no clear framework for applying this in a localised way. Environmental priorities will be different in East Anglia compared to the Scottish Highlands, for example. The multiple services offered by trees will also vary from landscape to landscape.



To provide a localised framework, government should establish a system of regional Natural Capital Strategies. These strategies would be developed for each major river basin by regional authorities (e.g. devolved administrations, city regions and collaborating county councils), through extensive consultation with communities, local authorities and national bodies such as Natural England, the Environment Agency and the Forestry Commission. Natural Capital Strategies would then provide the framework for the new Environmental Land Management (ELM) subsidy system by applying national policies in a way that reflects the geography of the UK. They would include some key features:

**1. Locally applied national targets**

Targets such as ‘30,000 Ha new afforestation per year by 2030’ are very difficult to implement from a national level. One region might have far greater potential for afforestation, whilst another might be more suited to peatland restoration. Regional authorities would translate such targets to a regional level, considering which areas have greater capacity to deliver.

**2. Priority thematic outcomes**

A key feature of Natural Capital Strategies should be a focus on outcomes, such as improved water or soil quality, rather than inputs such as particular types of woodlands prescribed for particular localities. This helps to avoid creating a prescriptive planning system for the countryside, which would limit innovation, entrepreneurialism and private property rights. The system should



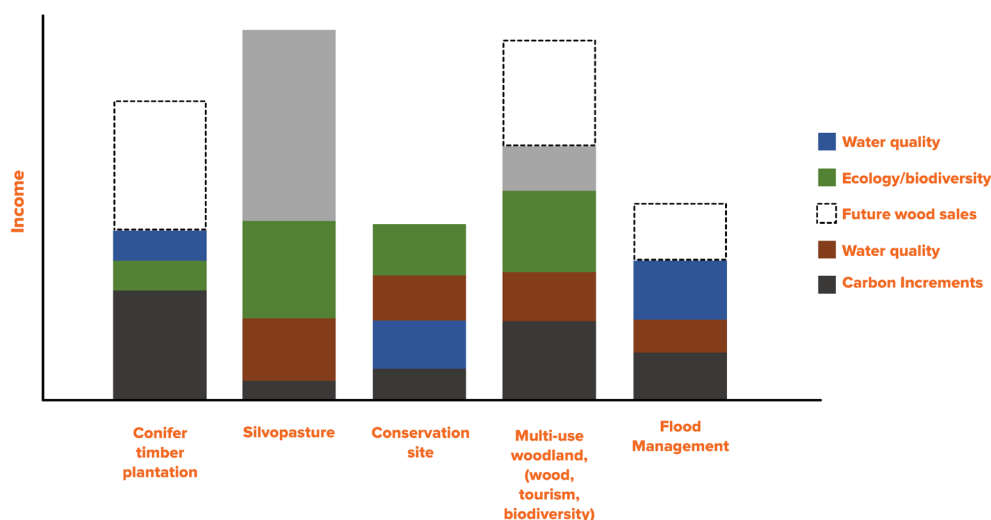
be designed to enable rather than prevent positive land uses.

### 3. Spatial priority areas

In order to avoid arbitrary constraints on landowners, strategies should avoid making spatial prescriptions, i.e. specifying particular land uses in particular places. However, if an area is prone to problems such as flooding, this could be included as an opportunity within the regional Natural Capital Strategy and funding could be offered for solutions such as upstream afforestation. The presence of such strategies also creates the opportunity to differentiate levels of funding, making more money available for higher priority projects.

We also propose the creation of a streamlined, time-limited and well-defined process for applying for woodland creation grants and permissions. The Forestry Commission should be given strong ministerial backing and confidence through the existence of Natural Capital Strategies and national tree-planting targets. To reduce conflict between regulatory bodies (e.g. between Natural England and the Forestry Commission) in the application process, appeals should be made to the Secretary of State for Environment, Food and Rural Affairs and decisions made according to the 25-Year Environment Plan.

### Supporting and incentivising woodland management



*Subsidy and market revenue streams for woodlands should be 'stackable' to encourage mixed-use woodlands delivering a range of public and private benefits, as in these hypothetical scenarios.*

To make woodlands integrate better with other forms of land management (especially farming), small and new woodlands need annual cashflow. In particular, land managers need incentives to manage woodlands proactively. Management plans are the first step in moving under-managed

woodlands into management, which creates investment and delivers a range of beneficial outcomes. It also helps to develop the regional supply chain, making it easier to plant new woodlands with confidence.

Different trees offer different services, depending on location, species and management regime. Most are likely to receive income from ELM payments as a result. This system should allow 'stackable' income streams so that a woodland that provides multiple services can be rewarded for each one. This allows for innovation and incentivises woodland managers to move away from single-function woodland design, rather than pushing them to do so under the UKFS.

However, all well managed woodlands offer the ability to store carbon every year and should be rewarded for this public good. We therefore propose the creation of annual Carbon Increment Payments (CIPs) with a more appropriate level of carbon pricing. These would ensure that a landowner received payment for sequestering carbon in their trees in line with an agreed management plan. It would replace the current Woodland Carbon Fund.

The CIP system would work as follows:

- 1. Carbon emitters would purchase carbon credits** from government or an officially sanctioned market, in place of paying a carbon tax or buying credits from an Emissions Trading Scheme. Such credits would reflect a government shadow price commensurate with its 'Net Zero by 2050' target. This would be significantly higher than the £5-10/tCO<sub>2</sub>e currently secured by woodlands under the Woodland Carbon Code system, which is too low to ensure additionality;
- 2. Woodland owners agree to woodland management plans** for new or existing woodlands, including certification schemes and sustainable end uses for any harvested wood;
- 3. Annual payments are made if the management plan is followed**, with audits every three years;
- 4. A 10% levy should be deducted from the annual CIP, to pay for independent auditing and monitoring** to ensure compliance with management plans, the UKFS and similar regimes.

There are a number of benefits to this system design:

- **Incentive for management:** The CIP system would create an immediate, annualised incentive for land managers to bring existing woodland into a management plan. This would boost supply of materials to the market, creating confidence for supply chain investors such as forestry companies and sawmills.
- **Flexibility:** By making annual payments in line with a management plan, the system can adapt to annual changes in woodland performance, harvesting and other changes. It can also be applied

to a range of woodland management techniques, from commercial forestry to low-density agroforestry.

- **Additionality:** Currently bilateral payments between polluters and foresters, assured by the Woodland Carbon Code, price carbon around £5-10/tCO<sub>2</sub>e. This is not enough to ensure additionality. A higher carbon price reflecting the government's shadow price trajectory towards Net Zero would be far more effective.
- **Funding:** This system accesses an external revenue source (a UK carbon tax or Emissions Trading Scheme), rather than relying on DEFRA's ELMS funding pot.

### Biomass heat

A key factor in ensuring woodlands have a reason for employing management plans is the biomass heat sector, which makes use of thinnings and residues in particular. Through the Renewable Heat Incentive, homes and buildings that do not have a gas grid connection are encouraged to use biomass boilers for heat. This creates a low-carbon renewable source of heat, an alternative to oil and coal. It also creates a revenue stream that has kept many woodlands from neglect.

However, the sector has stalled due to policy uncertainty and the industry is struggling. In Northern Ireland, the RHI scheme was responsible for bringing down the devolved government, creating political stigma. This is likely to have a damaging effect for woodland management incentives. Ministers should provide a long-term strategy for the sector as it provides a useful incentive for farmers to manage woodland, which is a key step towards developing supply chains for other woodland products. Ministers should also place a ban on new fossil fuel connections and boilers in off-grid properties by the mid-2020s, similar to actions taken to encourage electric vehicles.

### Investing in woodlands

Despite fitting poorly within cashflow-dependent businesses such as small farms, woodlands - especially if established and mature - have long been a desirable financial investment for financial speculators. Due to the general desirability of growing more trees, and because harvesting a crop midway through its growth cycle is deemed inappropriate, woodland trees are not subject to capital gains, inheritance or income and corporation tax on timber sales. Indeed, the tax relief available has been much criticised as a way to 'make the rich richer'. However, woodlands' lack of liquidity makes them accessible only to the wealthy and to some institutional investors with very long-term patient capital. Current forestry investment funds have high thresholds for investment.

We propose democratising this situation. Since the ELM System will involve public investment and since the tax reliefs on woodland assets come at notional public expense, there should be better mechanisms for the public to participate.

A comparable situation has been seen in the property sector, where

barriers to small investors used to be high while public investment led to impressive returns for those who could access the market. Part of the solution was the creation of real estate investment trusts (REITs) – effectively property companies with special rights and responsibilities. They invest in a range of property assets and often specialise, for example, in commercial or residential property. Unlike normal investment trusts, they are exempt from corporation tax but must pass 90% of their profits on to shareholders.

We propose the creation of Natural Capital Investment Trusts (NCITs), which would invest in a range of natural capital projects including woodlands, benefitting from the income generated by timber, ELMS contracts, CIPs and other revenue streams. Just like REITs, NCITs would not incur corporation tax but would pay the majority of profits to shareholders. Since woodlands have a range of tax benefits, this would make an NCIT a highly attractive vehicle for retail investors.

NCITs would come in two forms:

- **Public NCITs**  
Just like a REIT, a public NCIT could be traded on the stock market for any retail investor to buy, opening up this sector to smaller investors and accessing a potentially very large pool of capital.
- **Community NCITs**  
Community NCITs could take ownership of local natural capital such as a local woodland. It could use its beneficial tax status to maximise returns for community value, such as harvesting biomass feedstock for a local district heating network. Returns could be paid to the community as dividends, council tax discounts or as funding for local projects.

NCITs could also act as regional aggregators, managing a large number of small woodlands in the same region as an aggregated woodland estate, helping landowners to understand and access the opportunities in the market. They could invest in infrastructure and supply chains, from regional nursery capacity to sawmills, improving market symmetry between suppliers and wood processors to deliver more reliable volumes of UK-grown wood products to timber merchants.

### **Farm woodlands and agroforestry**

To facilitate agroforestry, as described above, we propose a range of measures. We suggest the creation of flexible felling licences for agroforestry and short rotation forestry. Most agroforestry is currently not dense enough to require felling licences, but more varied combinations of agriculture and silviculture may introduce ambiguities, which policy should anticipate and clarify.

At the moment, felling licences (permission to fell trees, granted

by the Forestry Commission and devolved equivalents) usually require trees to be replanted. A policy designed to protect against deforestation, this entrenches the concept of ‘permanence’ and also disincentivises landowners from afforestation, as changing land use in perpetuity presents a high risk to farmers, especially those with no experience of forestry.

By allowing some ‘experimental’ woodlands to return to agriculture if a trial scheme does not work, flexible felling licences would lower the barriers to agroforestry experiments and short rotation forestry. These schemes could then act as ‘gateways’ into forestry. This would encourage new models of agroforestry and make woodlands seem less daunting to many.

To ensure additionality, we suggest this policy only apply to new planting projects and we recommend piloting the new felling licences in 2-3 regions of the UK before national roll-out.

The Forestry Commission should also be mandated to create agroforestry demonstration projects and centres of excellence, working with the farmers’ unions to spread understanding of best practice. HM Treasury should also provide capital allowances for investment in agroforestry infrastructure, including fruit and nut processing.

### **Supporting forestry and timber markets**

Once trees reach the point of harvest, it is important that land managers can find buyers and are able to send trees to sawmills and then to market.

The largest market for timber is construction. Structural timber (e.g. timber frames) and non-structural wood (e.g. window and door frames) are increasingly useful, with modern engineering techniques able to maximise fire safety, technical structural performance and construction efficiency. Off-site fabrication of timber can significantly lower building costs and shorten timelines, with obvious implications for the UK’s housing shortage. It is also very positive for carbon sequestration, with around ten tonnes of carbon stored in the average timber frame house. Compared to masonry, concrete and steel, timber structures can reduce embodied carbon by around 20-60% in each dwelling.



***There is currently a vicious circle undermining investment in productive woodlands.***

On the whole, mass market timber frame housing uses softwood, which is well developed in the UK and could expand rapidly with the right market signals. Hardwood can be used too, but it is often a premium option.

In Scotland, over 80% of new housing starts are built with timber frames (mostly softwood). In Wales, the figure is around 30%, with England and Northern Ireland lagging at 22% and 17% respectively. This presents a huge opportunity for change. We recommend a target of 40% of new housing starts being timber frames in England, Wales and Northern Ireland by 2025.

Joinery for furniture and non-structural timber can use softwoods, but they also provide a very significant market opportunity for hardwood, which could be supplied by broadleaf woodlands if they were managed more appropriately for this purpose. They are not managed in this way because market signals for UK-grown wood have failed to maintain the supply chain. This worsens the condition of woodlands, meaning less wood of a consistently high quality, which lowers demand for UK-grown wood, thus perpetuating the situation.

To help and incentivise greater demand for all forms of UK-grown timber and wood products, policies should recognise the ‘embodied carbon’ in buildings – i.e. the amount of carbon emissions involved in construction, including transport and materials – through the UK’s future carbon pricing mechanism. Under this policy, construction companies would be charged a carbon tax relative to the embodied carbon of their buildings. This would incentivise greater use of low-carbon construction methods and materials, including locally sourced timber.

A taskforce should also be appointed by the Ministry of Housing, Communities and Local Government to improve the property industry’s understanding of timber in buildings. This ‘Timber in Buildings’ Taskforce should particularly focus on demonstrable fire-safety testing and standards-setting, to improve confidence in the safety of wood as a

building material. It should produce a Planning Policy Guidance document to support timber's place in planning policy. It should also support training across the sector, putting timber on the same level as concrete and steel as an option in the design and construction processes. Whilst this would be likely to create more wood imports in the short term, it would also create a market signal to support more woodland management in the short-term and longer-term investment in planting and infrastructure.

Finally, to enable the delivery of timber, wood products and biomass to market, supply chains need support at a regional level. Such supply chains should be driven by the market, but with government support, which should focus on early actions that will have immediate effects, in recognition of the long time-lag involved in forestry.

**Early priority actions include:**

- Support for nurseries and tree health by offering a tax rebate on seedlings sourced and grown in the UK;
- Working with the private sector to create and co-fund a Rural Skills Transition Fund to develop the skills base needed to bring unmanaged woodlands into management, among other land use transitions;
- A Timber Market Support package, with funding to support the development and marketing of initiatives that improve market information, such as online wood stock aggregation platforms.

**Later actions could then include:**

- A Timber Infrastructure Package for England and Wales, with funding and capital allowances for forestry equipment;
- A slowly rising carbon tax on embodied carbon in new buildings.

# Tree-Related Principles for Policy Makers

Tree planting is more complicated than most people recognise. To help policy makers to approach the topic, we suggest the following principles.

**1. We should use more wood from sustainable sources, especially in buildings.**

Making houses and consumer products out of wood stores carbon, creates investment in trees and reduces our use of high-emissions materials like plastic, steel and concrete. Sourcing the wood from UK woodlands also protects our trees from imported pests and diseases.

**2. Managed woodlands are good.**

Managing a woodland can help to improve its health and resilience, maximise growth, support biodiversity, optimise carbon sequestration and improve economic returns.

**3. There are many forms of woodland management and each has a part to play.**

Policy should be designed to support the full range, including mature woodlands with extensive open ground, agroforestry and well designed closed-canopy plantations. Currently, some policies get the balance wrong, which complicates the sector and dissuades those who might otherwise be willing to invest in it.

**4. Forestry and woodlands have a very long time-lag.**

Trees are a long-term endeavour and returns take decades to arrive, which creates a problem in the short term. Policy should be designed to redress this lack of short-term cashflow. It must also plan at least three decades ahead. Policymakers should also seek to move towards market mechanisms, so that woodlands depend less on the whims of five-year parliamentary cycles and political fashions.

**5. Trees do not preclude other uses of the same land.**

It is possible for land to be used for a combination of timber growing, outdoor pursuits, nature conservation and farming. These practices can and should be seen as mutually beneficial, not mutually exclusive. Policy should reflect this capacity for diversity, but also recognise that many woodlands (or sections thereof) have a clear purpose – woodland should not be expected to be all things to all men.



**6. Profitable woodlands beget more woodlands.**

Although sensitive sites must be protected by law, we need more than just environmental protections to promote planting at the scale needed to reach net zero emissions. To ensure continued investment in trees at the scale required, there is a need for income from harvested wood and timber, tourism and payments for environmental services.

**7. Forestry involves a specialist skillset.**

Large parts of the UK do not have this skillset, which makes it harder for farmers to learn the skills and reap the rewards. If we want to see a transition towards more forestry, we need to support those whose communities and way of life will be affected. They need training to help them manage, conserve and/or harvest trees, as well as well-developed local supply chains that help them to sell timber and wood.

## Summary of recommendations

1. **Objectives:** To provide clarity of mission, Ministers should adopt the following three objectives for UK tree policy:
  - a. Develop an integrated policy approach to all rural land uses;
  - b. Stimulate markets for living trees in the landscape;
  - c. Create clear market signals for UK-grown timber and other wood products.

### Integrated land policies:

2. **Natural Capital Strategies:** To deliver land use change and afforestation at a strategic level, Ministers should create a framework of Natural Capital Strategies.
  - a. Created by devolved administrations, city region authorities and collaborating county councils, Natural Capital Strategies will cover the major river basin districts, setting out land, water, ecology and related priorities for the new ELM system at a regional level.
  - b. These strategies should translate national priorities into local strategies based on local geology, hydrology and ecology, such as tree planting or peatland restoration. Delivery of such targets should be monitored by the new Office for Environmental Protection.
  - c. Natural Capital Strategies should be outcomes-based, not prescriptive, in order to safeguard private land rights and entrepreneurialism.
3. **Political backing:** To give the Forestry Commission confidence in its mission, Ministers should:
  - a. Create an annual target, based on a trajectory of reaching at least 30,000 Ha of new planting per year by 2030, enshrined in a legally binding Forestry Act.
  - b. Enable a right to appeal to the Secretary of State under the Forestry Act if grant applications are not upheld or take too long.
  - c. Give very clear and public backing to the Forestry Commission to deliver this target as set out in Natural Capital Strategies.
4. **Streamlined application process:** To make applications more attractive to land managers, the Forestry Commission should

develop a more streamlined application process for afforestation projects. Key features include a time-limited decision process and a well-defined role for stakeholders. There should be a right to appeal to the Secretary of State in cases where applications are not granted, with the Secretary of State having consideration for legally binding afforestation targets.

- 5. Forest of Britain:** To highlight the ecological importance of connecting nature at a landscape level, Ministers should create a Forest of Britain. This would act as a national totem and anchor for Nature Recovery Networks. A two-mile-wide corridor of forest and conservation land from John O’Groats, via Wales, to Land’s End, the Forest of Britain should connect as many conservation sites as possible and stimulate eco-tourism along its route.

### Stimulating markets for trees in the landscape:

- 6. Carbon Increment Payments (CIPs):** To improve cashflow for land managers and to prioritise tree planting as an early-win negative emissions solution, the government should create a Carbon Increment Payments system, allowing polluters to purchase carbon offset credits with a carbon price reflecting the government’s shadow carbon price. Credits would then be paid to woodland managers on an annual basis to improve cashflow.
- 7. Light-touch regulation:** To ensure light-touch but effective regulation for forestry, regulators should conduct annual drone/satellite fly-bys, with in-person follow-up inspections only if needed. To lower the administrative burden, land managers should receive ‘earned recognition’ for having a good track record of land management, meaning fewer and less intrusive check-ups over time. This system should be paid for through a 10% levy on the Carbon Increment Payments outlined above.
- 8. Woodland investment for everyone:** To democratise woodland investment, Ministers should legislate for the creation of Natural Capital Investment Trusts (NCITs), in the same model as Real Estate Investment Trusts (REITs). NCITs should come in two forms: Public NCITs (for floating on the stock market) and Community NCITs (to allow communities to own local forests).
- 9. Agroforestry:** To support farmers in using more trees, agroforestry should be placed at the heart of British farming. DEFRA should create an agroforestry team dedicated to ensuring agroforestry is well-researched, incentivised in public policies and understood throughout the land management sector.

**10. Felling licence reform:** To reduce apprehension among farmers, flexible felling licences should be piloted for Agroforestry, Short Rotation Coppice and Short Rotation Forestry schemes that are planted from 2020 onwards. These would allow a return to other land uses if forestry proves unsuccessful.

### Stimulating markets for harvested tree products:

**11. Certainty for woodfuel markets:** To support woodland management and investment, Ministers should create an immediate replacement or extension to the Renewable Heat Incentive and develop a clear strategy and ambition for woodfuel.

**12. Support for timber supply chains:** Ministers should create a package of support mechanisms to support regional supply chains as they respond to greater demand, including:

- a. Greater support for UK nurseries. Purchases of UK-grown seedlings should be tax-free to protect UK tree health and nurseries should receive enhanced capital allowances;
- b. A Timber Market Support fund, to support marketing and development of projects designed to improve market information;
- c. A Rural Skills Transition Fund, created in partnership with the private sector and farmers' unions, to help build a skill set in agroforestry, forestry and other forms of environmental land management;
- d. A Timber Infrastructure Package, with low-cost loans and enhanced tax reliefs for capital investments.

**13. Timber housing target:** To promote the market for timber, Ministers should set a target of 40% of all housing starts in England, Wales and Northern Ireland to be built with timber frames by 2025.

**14. Timber in Buildings Taskforce:** Ministers should establish a 'Timber in Buildings' taskforce, which will work with industry to ensure confidence in timber as a fire-safe (through robust fire testing systems) and technically effective building material.

**15. Embodied carbon in buildings:** Government should seek to incentivise UK-grown timber by applying a carbon tax to embodied carbon in new buildings, starting low but with an upwards trajectory to encourage architects, surveyors and construction firms to invest in new materials and techniques.

# UK Woodlands Today



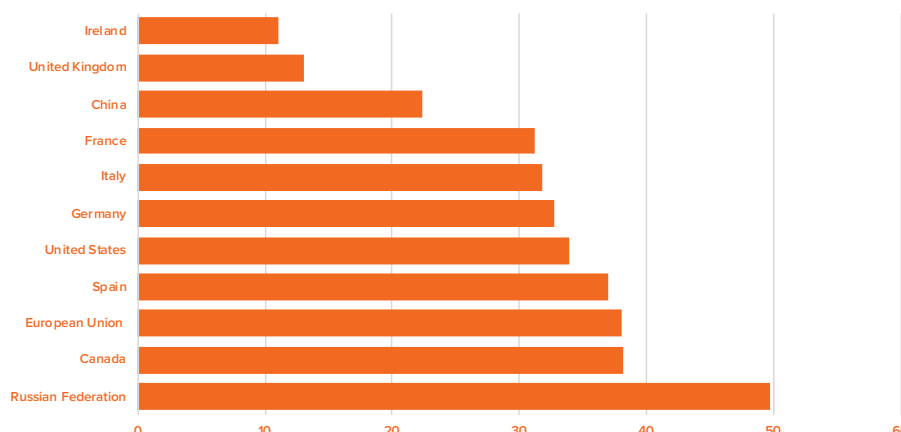
## Section summary

- The UK has very low tree cover of 13.1% by international standards: the European average is 38%. It is planting less than a third of the rate needed to reach net zero emissions.
- Scotland plays the dominant role in tree planting and forestry for timber production, and the sector has capacity to expand in response to market signals. England, Wales and Northern Ireland's forestry sectors are less agile, but have potential to expand with significant policy support.
- We do not use enough wood in construction, especially in England, Wales and Northern Ireland. Creating more demand for UK-grown wood would send a market signal in favour of woodland investment. There is significant scope to shape housebuilding policies to improve this.
- Based on the numerous public goods of trees and developing the domestic woodland sector, there is a strong argument for favouring UK-grown wood over imports through demand-side policies.

## Where are we now?

The United Kingdom's landmass currently has 13.1% tree cover, which is very low compared to the UK's neighbours and similarly developed economies. This places it fourth from the bottom among the members of the EU, for whom the average is a little over 38%. Looking broader still, the UK finds itself sixth from the bottom of a list of all European nations and sixth from the bottom again among the world's 20 largest economies. France, for example, has 31% tree cover and Germany has 32%.

Figure 1.1: Forest area as a percentage of land area



Source: World Bank / UN FAO

The UK’s coverage is equally split between the two largest types of trees, coniferous and broadleaf, although there are regional differences in the spread of the two. Scotland has the lion’s share of conifers, supplying its strong forestry sector, whereas England’s forests are dominated by broadleaves, which tend to hold higher amenity value than wood production. Welsh and Northern Irish cover is relatively balanced.

New planting currently tends towards broadleaves, although this trend is not evenly spread across the UK. Conifers accounted for around 35% of the last five years’ new planting, meaning the ratio of new broadleaf to conifers was close to 2:1. This runs counter to a popular narrative that new growth is dominated by impenetrable, monocultural pine plantations. New growth was also geographically well balanced, with broadleaf species adding 56% of new Scottish cover, contrary to claims about an over-abundance of pine plantations. There has been a relatively recent shift towards broadleaf woodland creation, perhaps reflecting the implementation of the UK Forestry Standard, which pushes woodlands towards diversity rather than monoculture (Figure 1.2). However, this may not be sustainable if softwood demand increases further.<sup>1</sup>

A third of the UK’s forests and woodlands are owned by the Public Forest Estate (managed by the devolved successors to the Forestry Commission) and the Commission has played a key role over the past century. However, 91.7% of new planting occurs in the private sector or through organisations such as the Woodland Trust, Trees for Life, Carrifran and the National Forest Company, supported by public grants.<sup>2</sup>

1. Lechner, H and Lonsdale, J, Assessment of the benefits of sustainable forest management, Pöyry, October 2018

2. Forestry Commission, Forestry Statistics 2018.

Table 1.2: Area of woodland by ownership and forest type

Forest type and ownership	England	Wales	Scotland	Northern Ireland	UK
<b>Conifers</b>					
FC/NRW/FS	151	98	429	56	733
Private sector	189	54	635	11	888
Total	340	151	1,064	66	1,622
<b>Broadleaves</b>					
FC/NRW/FS	63	19	41	7	130
Private sector	904	138	339	39	1,421
Total	968	157	380	46	1,551
<b>Total</b>					
FC/NRW/FS	214	117	470	62	864
Private sector	1,093	191	975	50	2,309
Total	1,307	308	1,445	113	3,173

(Source: Forestry Commission, Natural Resources Wales, Forest Service, National Forest Inventory)

## Our current planting rates

Table 1.3: New planting over 2013-18

	Average new planting per year 2013-18 ('000 Ha)	Average new planting per 100,000 Ha of nation's total landmass
Scotland	6,480	83.15
England	1,820	13.97
Wales	340	16.36
Northern Ireland	200	14.14

Source: Forestry Commission, Policy Exchange analysis

The UK as a whole is experiencing a sustained period of afforestation; that is, there are net additions to its forests and woodlands after harvesting and other losses. This means that the UK joins other developed nations in bucking the global trend of deforestation.<sup>3</sup> Across the UK, new planting has averaged 8,840 new hectares annually over the past five years, a total of 44,200 Ha added to British forests and woodlands.

Two features are striking in the afforestation data. The first is the uneven geography of afforestation between the home nations. Scotland accounted for almost three quarters of new planting over the last five years, adding an average of 6,480 Ha per year over five years. England added 20.5% of the total (1,820 Ha per year on average) and Wales and Northern Ireland added 3.8% and 2.3% respectively. An adjustment for the landmass of each of these countries provides an even starker contrast. In these terms, Scotland has outperformed the other nations by five or six times (see Table 1.3). This reflects the low quality of agricultural land in parts of Scotland, especially the uplands, where land is less suited to arable and pasture farming, making forestry more attractive as an economic land use. England has comparatively more good quality (and so profitable) farmland.

There is some suggestion that England and Wales are not only afforesting more slowly than Scotland, but are actually in a state of deforestation, or have been in recent years. Fewer than 560 hectares of new planting took place in England for both 2015 and 2016. Large parts of England are seeing exceptionally low tree-planting rates. Between 2010 and 2018, most of the South and East of England saw fewer than 75 trees planted per square kilometre.<sup>4</sup> To put this in context, a square kilometre of broadleaf woodland could host up to 100,000 trees. Commercially planted timber forests would typically have 250,000 conifers or 400,000 broadleaves per square kilometre. Even agroforestry, a typically low-density form of forestry, could include around 7,500-10,000 trees per square kilometre.

A combination of factors is causing woodland losses, including urban development with inadequate offsetting systems, epidemics such as ash dieback and problems such as windthrow (trees killed by strong winds), create a general attrition of the national woodlands, the rate of which is increasing. The issue has been raised by both the forestry industries trade body Confor and the Woodland Trust.<sup>5</sup>

Infrastructure is regularly reported as a problem. The Woodland Trust is leading a campaign against the High Speed Rail 2 (HS2) link, which threatens a large number of ancient woodlands. Several foresters also raised the impact of onshore wind farms leading to woodland clearance without adequate replacement (particularly in Scotland). It is clear that such actions should come under the government's 'net biodiversity gain' provisions in the National Planning Policy Framework and implementation of this should be thoroughly audited. This means new land should be purchased for new afforestation wherever it is lost as a requirement of planning consent.<sup>6</sup> Those who breach this requirement should be fined, with the fine reflecting the cost of land purchase and woodland establishment.

---

3. The Economist, Trees are covering more of the land in rich countries, 30 November 2017

4. Forestry Commission England, New planting of trees supported by the Rural Development Programme for England, and other forms of government support, February 2019

5. Beament, Emily, 'England "highly likely" to be suffering from deforestation, campaigners warn', The Independent, June 2018

6. In 2012, Policy Exchange noted a lack of transparency in development offsetting to restore biodiversity and recommended a 'net gain' principle, which has now been adopted by DEFRA, with 10% improvements in plant and animal life for every building development. See Newey, Guy, Nurturing Nature: Policy to protect and improve biodiversity, Policy Exchange, 2012.

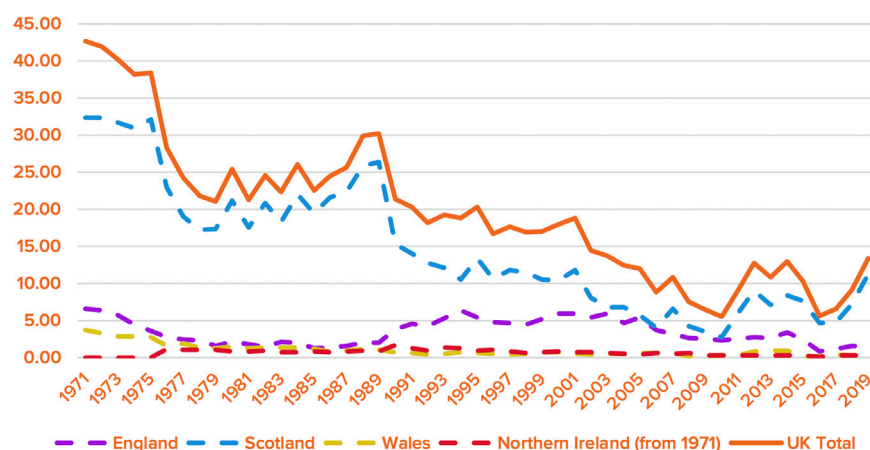


However, such a system cannot replace ancient woodlands, which offer environmental services that are impossible to replicate in new woodlands. Such trade-offs are a political choice between biodiversity and economic infrastructure. A current review of HS2's costs should therefore include the Natural Capital value of such woodlands in consultation with the Natural Capital Committee, Office for National Statistics and bodies such as Natural England.

Without a higher level of planting and replanting, England, Wales and Northern Ireland threaten to backslide. Low as it is compared with policy aspirations, the official planting rate therefore creates a false sense of security that these nations are at least making some progress. In some years, that may not be the case.

## Historical decline in planting rates

Figure 1.4: Annual area of new tree planting, 1976-2019

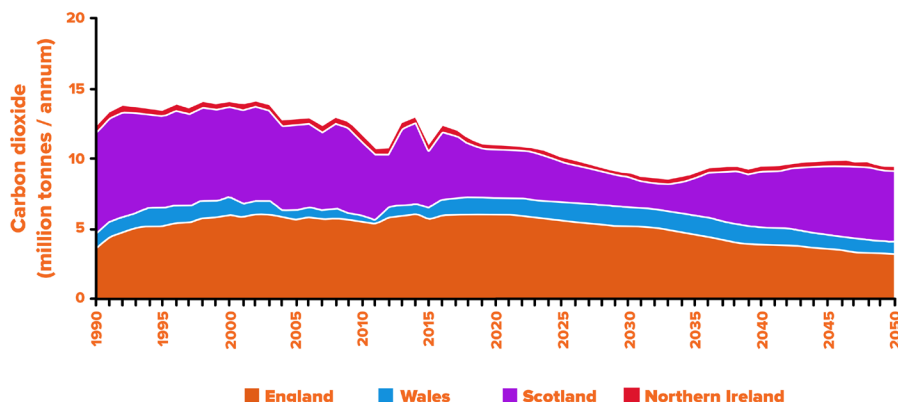


Source: FC/NRW/FS/NFI

The second notable feature is the decline in afforestation rates from a sustained level above 20,000 Ha in the 1970s and 1980s (Figure 1.4). Some of the planting seen in those decades had a damaging ecological impact, but to meet the Committee on Climate Change's prescribed rate of afforestation to reach net zero emissions by 2050, the UK must return to at least 30,000-50,000 Ha of new planting per year by 2030 – a level last seen in 1988-1990. With new planting standards and appropriate incentives, there is no reason why this cannot be reached and have positive ecological effects.

## Carbon sequestration in woodlands

Figure 1.5: Net annual change in carbon (CO<sub>2</sub> equivalent) in UK woodlands



Source: Centre for Ecology and Hydrology

The Forestry Commission estimates that UK woodlands currently store 3,781 MtCO<sub>2</sub>e (million tonnes of carbon dioxide equivalent). At current rates of planting, woodlands are providing a carbon sink of roughly 20 MtCO<sub>2</sub>e per year, meaning that they absorb 20 million tonnes of CO<sub>2</sub> more than they emit. This equates to removing 4.6% of UK greenhouse gas emissions, based on 2017 figures (the latest available). In emissions terms, it cancels out the emissions from all Heavy Goods Vehicles (HGVs) in the UK. Since the UK began reporting carbon emissions for most sectors under the United Nations Framework Convention on Climate Change in 1992, the growth of the forestry sector has provided an increasingly important carbon sink.<sup>7</sup>

Unless new planting increases significantly, the strength of this carbon sink is expected to drop over coming decades as trees planted between the 1950s and 1980s - a strong period for British afforestation - reach maturity and are therefore harvested (Table 1.5). Because woodland creation rates plummeted from the early 1990s, the total carbon store will drop unless there is a significant new afforestation programme.

A large portion of this carbon store will not be emitted into the atmosphere, as growing biomass is not the only 'pool' of carbon storage. Harvested wood products provide a small but continually growing pool of stored carbon with the additional benefit of displacing higher-emitting products such as fossil fuels, steel and concrete. In addition, the soil within woodlands contains up to three-quarters of a woodland's total carbon store.

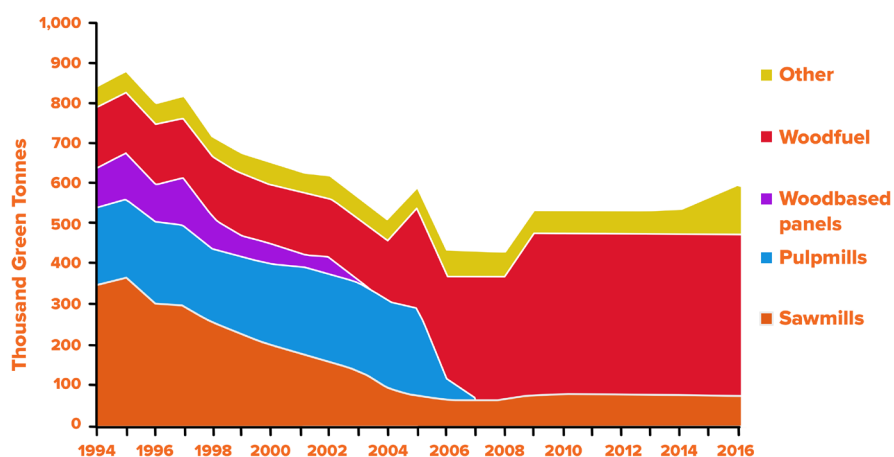
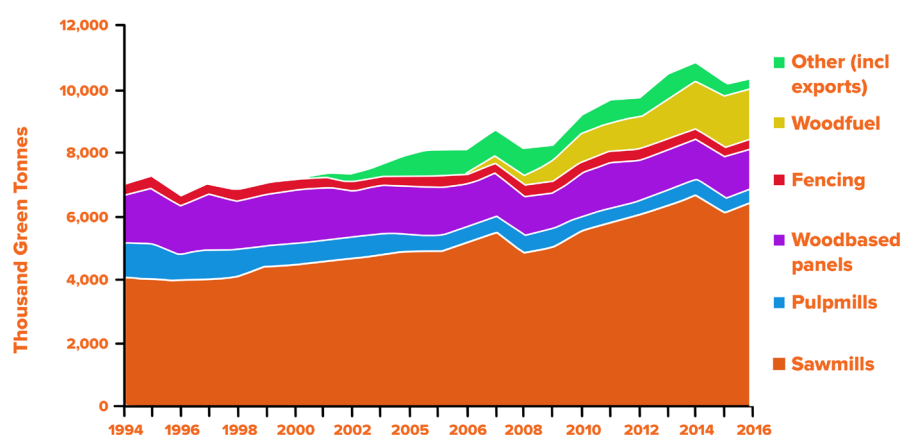
7. From CCC, Net Zero Technical Report, 2019

## Harvesting and wood supply chains

The UK is the world’s second largest importer of forest products by value after China.<sup>8</sup> With a relatively small woodland resource and a highly industrialised economy in need of large volumes of wood, the UK imports 80% of the 57 million cubic metres of wood products it consumes.<sup>9</sup>

There are two separate narratives in the UK’s wood sector, following the divergent fortunes of its conifer/softwood sector and its broadleaf/hardwood sector.

Figures 1.6 and 1.7: Softwood and hardwood deliveries to wood processors 1994 to 2016



Source: Forest Research

On the whole, the UK’s softwood sector is well developed, benefitting from long-term investment underpinned by the Forestry Commission. The Commission ensured long-term investment in softwoods throughout the 20<sup>th</sup> century by providing volume to market from the Public Forest Estate through long-term supply contracts, which has encouraged inward

8. Forest Research, World trade in forest products, 2016.

9. Forestry Commission, Forestry Statistics: Apparent Consumption of wood in the UK, 2018

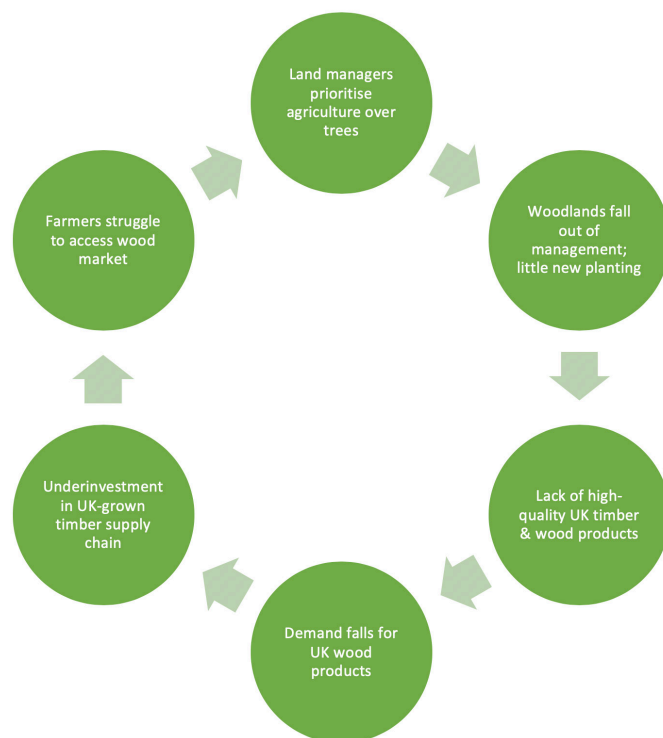
investment from international firms such as Egger and Iggesund. It has also supported wood-using businesses by maintaining supply at times when market prices are low and smaller timber buyers are less active.

Sawmill capacity is expanding and productivity rising in response to investment, mostly in softwood processing. Over the last quarter-century, there has been some consolidation in the sawmill sector, with an 18% drop in the number of UK sawmills, at the same time as overall production increased by 5%, demonstrating improved productivity.

The Scottish Government has used the devolution of forestry competencies well, sending clear policy signals to the market. Private-sector planting in Scotland has tripled between 2017-2019, with strong growth in both conifer and broadleaf planting.<sup>10</sup> Southern Scotland in particular has a strong supply chain.

The longer-term challenge to the softwood sector lies in a lack of domestic timber supply beyond 2030. A strong planting period between 1970 and 1990 is now being harvested (part of the reason for the sector's current strength). However, the continuous falls in planting rates since 1990 (Fig 1.4) means that the sector will face supply challenges – some industry figures warn of reaching 'peak wood' around 2030. A strong and growing signal of demand for UK-grown timber would help to support investment confidence in the sector, together with continued supply from the Public Forest Estate. If this does not happen, either the forestry and timber sector will stagnate, with negative consequences for tree planting, or removals will exceed planting, leading to net deforestation.

**Figure 1.8: A vicious circle undermining UK woodlands and timber production**



10. Forest Research, Woodland Statistics, June 2019

The hardwood sector presents much deeper and enduring challenges. Broadleaf woodlands grow more slowly than conifers. This makes them less profitable to manage for timber production. The flipside of the Forestry Commission's long-term investment in softwood output has been relative under-investment in broadleaves.

England has the bulk of the UK's broadleaves and should therefore have the majority of hardwood output. However, large amounts of English woodlands have either not been planted for the purpose of wood production or have fallen out of management.<sup>11</sup> One reason for this is the CAP rules that place biodiversity and water management as a prerequisite for grant funding, making timber production an afterthought. Either way, unmanaged woodlands tend to produce lower-quality wood, making it difficult for the UK's sawmills and timber merchants to source consistently high-quality wood for timber. They have looked to imports, which dampens the market signal for UK-grown wood even further. This lowers incentives for farmers and land managers to invest in woodlands and their management, creating even less consistent supply of high-quality wood. Farmers instead turn to more standard agricultural business models, supported by the EU's CAP. This vicious circle has led to a decline in the hardwood sector and a chasm between wood-using industries and the land management sector (Figure 1.8).

Those broadleaf woodlands that have remained under management have usually done so by accessing the woodfuel market, which has grown significantly (Figure 1.6 & 1.7). This growth was first supported by the Low Carbon Building Programme subsidy scheme from 2006-2010, which was replaced by the Renewable Heat Incentive in 2011.<sup>12</sup> Several foresters reported to Policy Exchange that woodfuel markets have been key to maintaining woodland management systems and in some places are key to making timber viable, since woodfuel provides an additional market for wood products alongside timber.

The hardwood sector (Figure 1.7) has seen significant reductions in all but the woodfuel and 'other' categories (the latter being mainly fencing and posts). The wood panel processing sector has almost ceased processing hardwood from UK forests, instead using increasing amounts from other sources, including softwood and recycled wood.

One effect has been the large volumes of 'overdue' hardwood in the broadleaf woodlands of Southern England, i.e. wood that has reached an optimum growth point and should have been harvested in order to allow new growth and maintain high growth rates. The Forestry Commission estimates that England has around 60-100m tonnes of 'overdue' timber in broadleaved woodlands, demonstrating that there is a lot of slack in the market.<sup>13</sup>

Since the UK grows much more wood than it harvests, there is an opportunity to bring more into management, supplying several different products. However, despite a wealth of knowledge and experience among the UK's foresters, many land managers do not know how to progress afforestation and woodland management effectively. They also lack the

11. By management, we refer to a formal system of managing woodlands to ensure productivity, including a range of techniques.

12. The biomass power sector has also seen significant growth under the Renewables Obligation and more recently Contracts for Difference, with Drax and Lynemouth power stations consuming wood pellets at very large scale. But these facilities almost entirely source wood pellets from traditional working forests overseas rather than from UK woodlands and therefore creates no competition for local resources.

13. Forestry Commission correspondence. 'Overdue' woodland is woodland considered to have passed its point of optimal growth, meaning its performance as a carbon sink is diminishing, as well as its timber production rate.

means to bring wood products to market at a competitive price.

It is clear that a lack of active supply chains in the southern UK makes it difficult for existing broadleaf woodland to be managed effectively for timber and other wood products. To address both challenges, government should aim to address the lack of demand for UK-grown wood, whilst also making it easier for the forestry sector to ramp up in response through investment in forestry training, marketing, machinery and infrastructure.

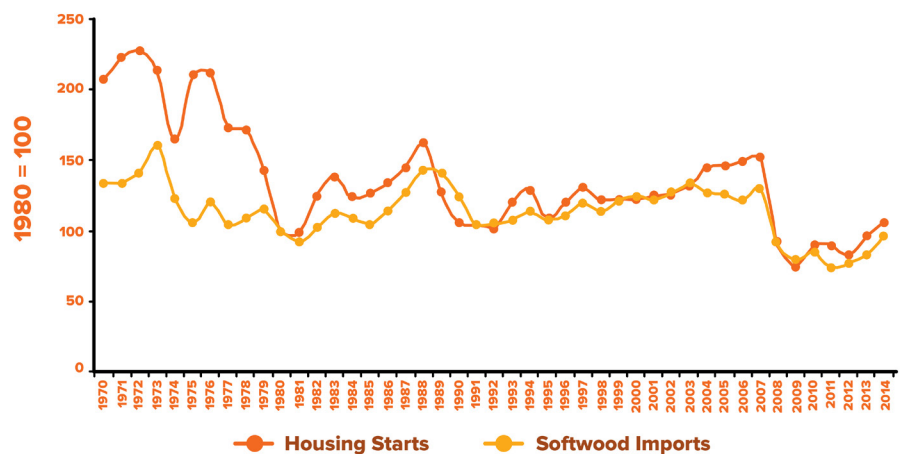
### Demand for UK-grown timber and wood

Aside from the significant role of trees in regulating a wide range of environmental and ecological systems, harvested wood is also a remarkably versatile, high-performance material and an excellent building material, for both structural and non-structural purposes. A primary raw material for furniture making, it can be used for a vast range of consumer goods and is also emerging as a source of commodities through biorefinery. A single tree can theoretically provide material for all of these uses at once. Woodfuel, humanity’s earliest fuel source, has also seen a resurgence as fossil fuels are replaced by renewables.

The UK uses around 57 million cubic metres of wood product, but only produces around 20% of this figure. A significant part of this appears to be an inability to match demand with UK-grown supply.

Structural timber (mostly softwood in the mass market) generally commands a higher price, since it must meet higher specifications. It also counts for 60-70% of the UK’s consumption of sawn softwood timber.<sup>14</sup> This makes structural timber the primary driver in many wood markets, with other wood products (e.g. furniture, pulp, paper and woodfuel) being junior co-products. So, if a market is unable to produce structural timber at scale, it will find it harder to produce those other co-products. Lack of demand for structural timber undermines the market’s ability to supply them.

Figure 1.9: Indexed UK Housing Starts and Sawn Softwood Imports, 1970-2014



14. Moore, Nicholas, Timber Utilisation Statistics, Timber Trends, 2015

15. Ibid.

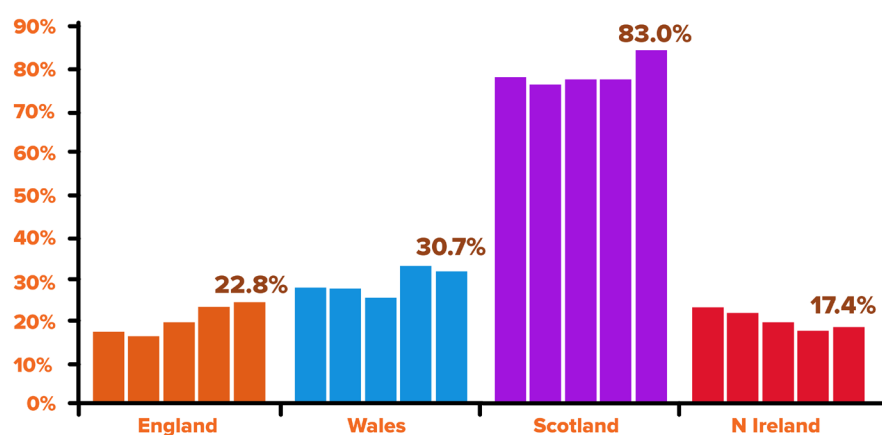
Source: Timber Trends<sup>15</sup>

This relationship can be seen in the close ties between the housebuilding industry's performance and sawn softwood imports. The UK imports most of its timber, so imports are a useful proxy for timber demand. Figure 1.9 shows the close link between the two. In 2014, 83% of these imports were for the construction industry.<sup>16</sup>

Compared to Scotland, the other nations of the UK build very little timber frame housing (Figure 1.10), despite timber being a very good, affordable alternative to steel and concrete, as well as being significantly more desirable in terms of carbon emissions. The BioComposites Centre at Bangor University estimates that a new timber frame house can save 1.7-3.2 tCO<sub>2</sub>e by displacing high-emissions materials such as steel and concrete and store an additional 2-4.2 tCO<sub>2</sub>e in the timber itself.<sup>17</sup>

Timber in buildings is obviously not the only potential market for wood. However, it does appear to be a driver of forestry practices and, where timber-grade wood is supplied, it can support supply of co-products such as fencing, joinery, wood chip and packaging.

**Figure 1.10: Timber frame new house starts as a percentage of each country's total housing starts**



Source: Structural Timber Association

There is a strong argument to source more of this wood in the UK. Firstly, the UK would benefit from the wide range of benefits offered by living trees, which are discussed in more depth later in this report. Secondly, it would likely cut down on transport emissions by reducing imports. Thirdly, it would retain 'value added' within the UK. Growing trees for domestic use would also cut the costs of meeting our international carbon commitments (UNFCCC rules are production-based, meaning that we cannot claim the carbon sink value of trees grown in other countries). Finally, there is an argument from the perspective of resilience and tree health: a more active domestic sector would encourage more use of home-grown seedlings, reducing the risks of importing foreign pests and diseases for an already vulnerable tree population.

16. Ibid.

17. CCC, Biomass in a Low Carbon Economy, 2018

The drawback with timber and other wood products for buildings is that forestry involves long time lags. However, there are actions that policymakers can take to get more out of existing woodlands and to create long-term market signals that stimulate supply chain and woodland investment.

The Centre for Ecology and Hydrology's models for future land use scenarios show that a 'Business as usual' approach would allow 20% of broadleaf woodlands to be managed, but all of the wood harvested would be used as woodfuel. More ambitious carbon-reduction scenarios, including the Net Zero emissions target adopted by government, would involve both far higher levels of woodland management and far more production of timber as well as woodfuel.<sup>18</sup> Using more UK-grown timber in markets such as construction should be central to this.

Put simply, we must plant and manage more woodlands for the purpose of harvesting timber and wood products if the UK is to achieve net zero emissions by 2050.

---

18. Thomson et al., Quantifying the impact of future land use scenarios to 2050 and beyond - Final Report, November 2018



# A Short History of Woodland Policy in the UK

A short history of woodland policy in the UK	
<p><b>Pre-history:</b> Clearing woodland for human settlement</p>	<p>After the last ice age (c.12,000 years ago), retreating glaciers allowed trees to cover 70-80% of land.</p> <p>When melting waters flooded Doggerland and low-lying marshes became the English Channel, they cut off the British Isles and created a set of tree species now seen as 'native'.</p> <p>Expansion of human communities led to large clearances of trees for settlements, wood products and hunting grounds, leading to roughly 30% cover by the time of the Roman invasion in 50 BC.</p>
<p><b>Medieval until early modern period:</b> Competing land and economic rights</p>	<p>In 1086 AD, the Domesday Book suggested there was 15% tree cover in England.</p> <p>Norman aristocracy used new land rights to close off lands to the public, the origin of the term 'forest', meaning exclusive hunting land for aristocratic use only. Over-use of this policy led to significant class conflict.</p> <p>Timber for shipbuilding became key from the 1500s onwards, with forests such as the New Forest becoming 'inclosed' (reserved) for strategic military supply. The Mary Rose alone needed 600 oak trees for its construction.</p>
<p><b>20th century:</b> National emergency</p>	<p>By 1900, forest cover had been depleted to just 5%. The use of wood for trenches and coal pit props in World War I almost exhausted domestic wood supplies, leaving Northern Ireland with 1% cover and England with 4%.</p> <p>After WWI, the Forestry Commission (FC) was created in order to prevent future exhaustion of domestic timber supplies, especially in times of war.</p> <p>FC received 48,000 Ha of Crown Estate woodlands. In its first ten years it bought 240,000, planted 56,000 and paid grants to support 22,000 planted on private land.</p>

<p><b>Post-WW2 period: Growth of the private sector</b></p>	<p>Replanting post-war stocks became a priority under Labour and Conservative governments of the 40s and 50s, with the creation of a 'Dedication Scheme' to support private woodland creation, tax reliefs and felling licences to prevent deforestation.</p> <p>The private sector took on an increasing role, with new technologies (e.g. chainsaws) and more confidence in supply due to high afforestation rates.</p>
<p><b>1960s-1980s: Trees in the wrong places</b></p>	<p>New machinery and more use of tax reliefs led to ecologically inappropriate tree planting on a large scale, leading to the 'Crisis in the Flow Country', in which unique blanket bogs were destroyed in Caithness and Sutherland. The issue was not recognised by government until the late 1980s following a report by the Nature Conservancy Council. It resulted in removal of the enabling tax loopholes and a major drop-off in planting rates, together with a chastened Forestry Commission shifting towards amenity woodlands. Roderick Leslie, a former FC senior staffer, says the FC embarked on 'twenty years of concerted effort to exit from the stink of the Flow Country,' with a redoubled focus on environmental and human amenity value of woodlands.</p> <p>New types of farming equipment and the CAP also led to less tolerance of trees on farms. In the words of the conservationist Isabella Tree:</p> <p>"Trees had no place in this new scheme of things. Freestanding trees in the middle of fields were now an aggravation, disrupting the trajectory of farm machinery and taking up precious yards of viable land... In an effort to maximise efficiencies and to accommodate bigger machines with broader turning circles, fields were enlarged.... Hedgerows were ripped out... Included in these hedgerows were thousands upon thousands of trees..."</p>
<p><b>1990s-present: Political change</b></p>	<p>The 1990s and 2000s saw a dramatic drop in planting rates, especially in Scotland, mostly due to sensitivity caused by the Flow Country issue. The underplanting is now felt with undersupply of timber 30 years later. Conversely, England increased its planting of amenity broadleaf woodlands, many of which now lack management.</p> <p>In 1998, the UK Forestry Standard (UKFS) was published in order to bring together multiple pieces of legislation, ecology and design guidance. At the same time, the UK Woodland Assurance Standard was introduced, providing wood product manufacturers with assurances about the sustainability of the wood they bought.</p>

In 2011, an attempt to privatise the Public Forest Estate was withdrawn after opposition from over 500,000 petitioners. The coalition government instead launched an Independent Panel on Forestry, which recommended taking the PFE into a public trust with statutory protections, as well as creating a 'woodland culture' for the UK.

However, perhaps the most significant change in recent forestry policy has been the devolution over recent years of forestry policy to the Scottish government, the Northern Irish Forest Service and National Resources Wales, while English forests are regulated and managed by the Forestry Commission and Forestry England. This has led to a divergence in forestry policies in recent years.

Arguably the next most significant event in British forestry policy will be Brexit, which is likely to lead to fundamental reforms away from the CAP and towards payment for public goods. This report offers some opportunities to exercise that additional competence for the benefit of tree planting throughout the UK.

## Policies and aspirations for tree cover

There is an overwhelming consensus in favour of planting more trees in the UK. As a result, there is a range of projections, policies and proposals for the rate of afforestation needed. For context, the table below sets out a number of such projections from recent years.

**Table 3.1: Selected policies, aspirations and proposals for UK annual afforestation rates by 2030<sup>19</sup>**

Proposal by	Proposed annual afforestation rate by 2030 (hectares)	Comments
Combined current policies of England, Wales, Scotland and Northern Ireland (as below)	26,300	A combined figure taken from the policies of devolved administrations which have responsibility for forestry policy.
Scotland	15,000	From the Scottish government's Forestry Strategy.
England	9,300	From the Clean Growth Strategy. Other policies (e.g. 25-Year Environment Plan) have lower targets.
Northern Ireland	N/a	We were unable to find a clear target for afforestation in Northern Ireland.
Wales	2,000	From the Welsh Assembly government's Woodlands for Wales strategy.
Conservative General Election pledge 2019	30,000	30,000,000 trees by 2025.
Liberal Democrat General Election pledge 2019	60,000	60,000,000 trees by 2025.
Labour Party General Election Pledge 2019	Two billion trees by 2040	No target area of tree cover provided.

19. Based on Harris, Eleanor, Woodland carbon targets for the UK, Confor, 2019

Committee on Climate Change		
CCC Multifunctional land use scenario	30,000	Required if a range of other carbon sequestration techniques, such as carbon capture and storage, are deployed at scale.
CCC High Biomass scenario	50,000	Required if other sequestration techniques, such as carbon capture and storage, are not deployed at scale.
Environmental NGOs/campaigns		
World Wide Fund For Nature (WWF)	40,000	
Friends of the Earth	100,000	Why the UK should double its forest area to combat climate change (2018).
Centre for Alternative Technology	260,000	Zero Carbon Britain: Rethinking the Future (2013).
Industry & other institutions		
Confederation of Forest Industries (Confor)	40,000	Think Global, Plant Local (2019).
Royal Society/Royal Academy of Engineering	57,000	Greenhouse Gas Removal report (2018).

Despite these targets, afforestation rates have been in long term decline, albeit with a small uplift in recent years. Often, policies have failed to address the underlying fundamental barriers to afforestation. Mostly this has not been the fault of UK policy itself because the fundamentals of land use in the UK are dominated by EU subsidies and rules.

Area-based targets are not particularly helpful as a starting point, since they overlook the reasons behind wanting trees. The number of trees is almost irrelevant, whereas their function is key.

The reasoning behind the CCC's 30,000 Ha/year target is trees' capacity to absorb and store carbon. Therefore the overall number in a national target acts as a proxy for carbon sequestration volumes. This headline figure can then be broken down into regional applications of trees for a wide number of other functions, from timber harvesting to flood management and amenities.

The actual area covered by trees will be hugely variable within these parameters, since one hectare can accommodate a range from 1 to 3,500 trees, depending on its management regime. The changing nature of forestry, in which yields are constantly improving, also means that one actively managed hectare of trees in 2019 may hold significantly more

carbon than did one hectare just 20 years ago.

There is also a problem of ‘ramping up’ capacity. The forestry industry body Confor points out that the UK is not currently equipped to expand seeds and seedling supply to a volume 3-5 times higher than the current rate. UK-based nurseries are not able to seed, grow saplings and deliver at the scale needed. Doing so too quickly would increase our over-dependence on imported seedlings, which increases the risks of disease and invasive pests. Any tree planting policy must explicitly enable investment in the UK’s tree nurseries. We suggest purchases of all UK-grown saplings be tax-free and nurseries should have access to enhanced capital allowances as part of a wider package of forestry supply chain support.

The UK also lacks the skills base to plant so many trees and to manage them. Land supply may also be a challenge – competition with agriculture is a fundamental problem for forestry under current market and subsidy conditions. Public and private investment is needed to unlock all of these elements of forestry infrastructure and skills. These factors make the more ambitious suggestions of 100,000+ hectares per year somewhat unrealistic. However, they help to highlight priorities for early action to support the sector.

Finally, but perhaps most importantly for future generations, too many targets in the current policy debate focus on carbon sequestration in order to reach a 2050 target for net zero carbon emissions. This is likely to lead to distortions. Trees are a very long-term undertaking: hardwoods even more so. The pro-conifer/softwood policy taken in the early 20<sup>th</sup> century still has repercussions for tree policy now. A better outlook should consider far longer-term issues and ask what type of trees, timber and harvests do we want future generations to enjoy.

The CCC’s higher figure of 50,000 Ha is ambitious but still in a mid-range alongside the estimates of industry and academic institutions such as Confor and the Royal Society. The CCC’s underlying target for carbon sequestration achieved through afforestation is even more realistic because it has used conservative estimates for the carbon sequestration capacity of modern forestry – i.e. we can achieve more carbon sequestration with less land than we used to. This is only because of continual investment in the forestry sector, using measurements and incentives that directly relate to woodland productivity (i.e. the market measures timber and wood outputs, not area covered). If we invest in carbon sequestration and timber productivity, woodlands can improve these outputs. If policy makers instead focus on area of land covered by trees, the signals towards these outcomes are weakened.

### Recommendation: Setting targets

Political parties and Ministers should not set targets for numbers of trees to be planted, because such targets are misleading. They should focus first on two elements:

- 1. The target amount of carbon they want to be sequestered by trees and woodlands in the UK over a time period (including in soil, deadwood, etc.).** To ensure this is meaningful over the long timescales involved in woodland management, a legally binding target should be set out in a new Forestry Act and become part of the 25-Year Environment Plan. Secretaries of State should then be held accountable by the Office for Environmental Protection.
- 2. The ways in which they will incentivise and regulate the environmental and socio-economic functions of these trees.** This should be set out in regional Natural Capital Strategies as a framework for ELM payments.

# Incentives and Regulations in the Woodland Sector

## Section summary

- EU subsidies and UK regulations have failed to create an integrated land use policy that sufficiently rewards the value of trees in the landscape.
- This has led to a farming and land management culture disconnected from the forestry sector.
- Brexit presents an opportunity to pay adequately for the valuable goods and services provided by trees and forestry.

## EU subsidies

Agriculture within the EU comes under the remit of the CAP, whereas forestry is a national competence (and devolved further to the UK's constituent nations). As noted by Policy Exchange's *Farming Tomorrow* paper on post-Brexit British agriculture, this has created a cultural and economic divide between the two sectors over several decades.<sup>20</sup>

The CAP consists of two 'pillars'. Pillar I provides for the Basic Payment Scheme (BPS), which pays farmers based on the amount of land they manage. Pillar II is targeted at a range of measures including environmental improvements, combatting climate change and increasing agricultural productivity. Pillar II includes payments for environmental management and investment, including woodland grants.

However, Pillar I is dominant, with payments to the UK made under Pillar I in 2018 totalling £3.174 billion, compared to payments under Pillar II of £760 million.<sup>21</sup> The rules for the BPS in Pillar I are therefore likely to have far greater effects than those in Pillar II. The latter is often described as little more than a 'top-up'.

In addition to the CAP payments, the Common External Tariff protects farmers and arguably supports inefficiencies in land use. It combines with the BPS to limit land-use change in response to land management inefficiencies and market price signals. It dampens the signals that might otherwise support afforestation.

By focusing on land area, the BPS helps farmers to 'average out' less productive land, also known as marginal land. One land manager interviewed by Policy Exchange described it as a 'comfort blanket' that prevented farmers from exploring alternative land use revenues. Advances in agricultural technology ('AgTech') are already allowing farmers to identify such areas and improve productivity through targeted

20. Lightfoot et al., *Farming Tomorrow: British agriculture after Brexit*, Policy Exchange, 2017, p. 66

21. DEFRA, *Agriculture in the UK 2018*, June 2019



interventions.<sup>22</sup> Measures might include targeted fertiliser use, trying different crops, afforestation or simply selling a patch of land. With the BPS in place, all these options and their many benefits are not fully incentivised.

In addition to the general disincentive to diversify under the BPS, the scheme's own rules create a bias against multiple uses of the same land. The BPS's 'active farmer' rule makes it hard to share the same patch of land when one use has much longer timescales than the other or creates 'ineligible features' that might limit agricultural use – i.e. forestry mixed with agriculture.<sup>23 24</sup> The rules therefore disincentivise multiple uses such as agroforestry. A similar problem applies under the Countryside Stewardship Woodland Creation Grant scheme, under CAP's Pillar II, which prevents agricultural use of the woodland for up to 15 years.

Finally, the audit process for the Woodland Creation Grant includes administrative checks and site visits from (potentially) the Forestry Commission, Natural England and/or the Rural Payments Agency. This appears unnecessarily onerous both for the landowner and the public purse. A risk-based system, earned recognition (viewing landowners and agents with good compliance records as lower risk) and better use of technology such as drones and satellites would help to achieve a lighter touch process for future grant mechanisms.

There is also an EU-funded Farm Woodland Premium Scheme, which offers 'income foregone' for farmers whose afforestation projects lead to lower agricultural income. However, its payment rates of £260-300 for improved land are considered by farmers to be too small to support significant afforestation projects.

In line with Policy Exchange's recommendations in *Farming Tomorrow*, the Agriculture Bill proposes to phase out the BPS between 2021 and 2027 and replace it with an Environmental Land Management System (ELMS), rewarding land managers for practices that improve water, soil and air quality, carbon sequestration and biodiversity. This will create an opportunity to remove disincentives for afforestation. However, ELMS currently lacks a clear framework for identifying local priorities for environmental improvements.

As well as EU schemes, the UK has its own schemes for supporting afforestation. These include, but are not limited to:

- Woodland Creation Planning Grant (England)
- Woodland Carbon Fund, Carbon Guarantee and Carbon Code (UK wide)
- Woodland Grant Scheme (Scotland)
- Strategic Timber Transport Fund (Scotland)
- Glastir Woodlands and Glastir Advanced (Wales)

22. For a selection of examples of AgTech, see NESTA, Precision Agriculture, <https://www.nesta.org.uk/feature/precision-agriculture/> Accessed 13 June 2019

23. Rural Payments Agency, Basic Payment Scheme: rules for 2019, 2018

24. The same problem of lack of long-term stability on a parcel of land affects tenant farmers, as forestry timelines often extend beyond the terms of their tenancies. Therefore they are unlikely to see the fruits of their investments. This is not caused by the BPS though; it is more integral to UK land management.

### Regulation

The UK Forestry Standard (UKFS) was first published in 1998 to consolidate all relevant legislation, both domestic and international (EU and multilateral treaties on forestry such as the Montreal Process and Forest Europe). Forestry Commission grants are dependent on UKFS compliance.

The UKFS appears to be working well and is revised every five years based on new legislation and research. Twenty years would normally be ample time to consider the success of a public policy framework, but in forestry it is not. The first conifers planted under the auspices of the UKFS will be undergoing their first thinnings around now and some faster growing or restructured older stands (an area of trees managed as one) may be undergoing very early harvests. Those planted since 1994 are also affected by the UKFS requirement to structure stands with more open ground and species diversity, which may have contributed to some decline in numbers of trees planted in recent years but should still be seen as a long-term positive. An assessment of the UKFS is a rolling process, but broadly the Standard appears to be the right approach and should, over time, create further incentives towards sustainable forestry.

There are also voluntary schemes for woodlands such as the Forest Stewardship Council, the Programme for the Endorsement of Forest Certification and the UK Woodland Assurance Scheme, which provides assurance to wood product manufacturers that timber has been procured from sustainably managed woodlands.

The weaknesses in the UKFS appear to be extrinsic, i.e. in its implementation and enforcement, rather than the document itself. On the one hand, commercial foresters have accused regulators of overzealous application of the UKFS. On the other, NGOs claim that the UKFS is not enforced properly after judgements are made. They also make this claim about felling licence conditions (usually around replanting).

A simplified system that supports more flexible land use and experimentation is needed if farmers and smaller landowners are to be encouraged to engage in forestry.

#### Recommendation: A better planning system for forestry

**Local government should develop clear regional priorities for ELMS via Natural Capital Strategies, to help guide grant decision-making and to fast-track applications that are in line with Natural Capital Strategies.**

**There should be a streamlined application process for afforestation grants and ELMS should replace the majority of forestry grants.**

**ELMS outcomes should be monitored properly by a single, well-resourced regulator.** Landowners should gain 'earned recognition' (i.e. less auditing in return for a good record). Remote sensing technologies should be used for light-touch monitoring followed by in-person audits only when necessary.

# Opportunity Areas for Tree Planting

## Section summary

- Properly incentivised conservation projects offer an opportunity for afforestation, but must allow for integration with commercially managed woodlands.
- Many farms are already struggling and face major subsidy reforms. Farm woodlands, agroforestry and upland ecological restoration all present opportunities to diversify revenue and improve outcomes.
- Unmanaged woodlands present a largescale and immediate opportunity to improve land revenues and increase investment in wood supply chains. Management plans should be a government priority.

As set out throughout this report, there are fundamental features of UK land policy that prevent more trees being planted. However, there are also imminent changes coming in public policy, including Brexit and the need to achieve net zero carbon emissions by 2050, which present significant opportunities. Some of these, such as changes to traditional farm business models, will be painful for those working in affected sectors. Government will need to work to limit the difficulties of transition.

However, these same communities stand to benefit from new policies that support a rejuvenated forestry and land management sector. If implemented properly, well-incentivised afforestation schemes will allow rural communities to diversify and adapt to changing conditions, making them more prosperous and less vulnerable in the medium-to-long term. Helping and incentivising these communities to seize such opportunities will lessen the challenges brought by change as well as achieving public policy goals around tree planting and climate change.

We identify three key opportunity areas for afforestation and improving woodland: conservation policy, farmland and unmanaged woodlands. However, there are many other opportunities beyond these three.

## Opportunity area 1: Conservation areas

The UK is facing a major decline in its biodiversity. Despite the UK having thousands of conservation sites, such sites are often islands in a sea of agriculture or urbanisation. This prevents species from finding new mates or spreading seeds (which affects genetic resilience) and from accessing new resources and nutrients. The State of Nature Report 2019 found that 41% of species have declined in abundance since 1970. Breeding bird species have plummeted, reflecting intensification of farming over

50 years. Agriculture, pollution, urbanisation, unsustainable woodland management, hydrological change and invasive non-native species are all considered drivers of this decline.

Against all of these negative trends, trees can provide a line of defence. This is particularly true of native tree species, which can naturally support Britain's ecosystems in myriad ways. Trees provide protective habitats, prevent soil erosion (thereby protecting a key ecological substrate), clean soil and air of pollutants, manage hydrology and provide many other natural services. For trees to play their full role in restoring biodiversity, policy must ensure a good range of tree species and management techniques across the landscape.

Trees and woodlands will play a key role in the government's implementation of Nature Recovery Networks. Under this policy, it is likely that each local authority will be required to set out areas for nature recovery and work in partnership with farmers and other landowners to improve and augment connections between conservation sites. Trees will be a key tool for doing so and the policy, if implemented successfully, provides an opportunity for woodland creation and tree planting.

There is some risk to forestry and woodland in this prospect: by bringing woodlands into Nature Recovery Networks, productive woodlands may become over-regulated, with expectations not also applied to farmland. This risks undermining the investment case for woodlands if they are seen as solely biodiversity hubs to the exclusion of other uses. To avoid this and to support investment, UKFS-compliant productive woodlands should be eligible to be included within Nature Recovery Networks. There is some suggestion that farms, through, for example, improvements to hedgerows, would be able to become integrated into Nature Recovery Networks.<sup>25</sup> If so, it would be inconsistent to exclude working forests which also display connective features.

There is also an opportunity for government to take a proactive, high-profile lead by creating a major new forest with a strategic function. Through a number of relatively recent projects, the Forestry Commission, National Forest Company, NGOs and others have built up a knowledge base and learned lessons that can be applied to large-scale afforestation projects. In view of recent political priorities such as the 'net zero' commitment, these should be applied to a national-scale project that highlights the importance of connectivity in nature and galvanises local communities to engage in the same mission. We propose the creation of a 'Forest of Britain', a two-mile-wide corridor reserved for biodiversity running the full length of mainland Britain.

---

25. DEFRA, Nature Recovery Network: Discussion Document, 2019

### Recommendation: The Forest of Britain



**Recommendation: Government should lead the creation of a ‘Forest of Britain’ running from John O’Groats to Land’s End as a totemic project to reconnect nature.**

The Forest of Britain would aim to connect as many conservation sites as possible, including Sites of Special Scientific Interest, Special Protection Areas, National Nature Reserves, Local Nature Reserves and National Parks. It would be a two-mile-wide corridor for wilderness, including tree cover and a host of open land types such as scrubs, heaths, bog, peat and coastline. The project should be viewed as an ‘anchor’ for nature recovery networks and a national statement of intent on reconnecting nature at a landscape level. It should also aim to support the genetic diversity of Britain’s tree species, focusing on native species and hardwoods.

Assuming a route of around 1,200 miles from John O’Groats to Land’s End via Wales and the Lake District, with an average two-mile width along its route, the Forest of Britain would eventually cover an area of around 2,400 square miles (6,216km<sup>2</sup>). This would make it the largest protected area in the UK by a big margin (the second largest being the Cairngorms National Park at 1,748m<sup>2</sup>/4,528km<sup>2</sup>). With 60% forested at a density of 1,000 trees per hectare on average, the Forest of Britain would include over 300 million trees and add 370,000 Ha of new tree cover.

The Forest of Britain would involve a range of management techniques, from interventionist conservation and ‘hands-off’ rewilding to ecologically sensitive commercial forestry. To achieve this, an organisation should be created based on the model of the National Forest Company – likely government-owned to begin with, aiming to become an independent trust once established. The ‘Forest of Britain Trust’ would focus on facilitating landowners to convert their land and working with other conservation trusts and local authorities to develop the route through land purchases and conservation covenants.

The Forest of Britain would not only create a valuable strategic role in the restoration of biodiversity; it would also be economically restorative. It should be funded through a combination of public grants, Carbon Increment Payments (explored later in this report), local authority investment, corporate sponsorship and investment, endowments and local tourist taxes. A central element should be the inclusion of footpaths, cycling and bridle routes, visitor centres, outdoor pursuits centres and other features designed to facilitate human access.

## Opportunity area 2: Farms and Agroforestry

Farmland covers 72% of the UK’s land mass. There are 217,000 individual farm holdings, meaning that the average farm covers just over 81 Ha. There is plenty of variation within this average, with 103,000 farms covering less than 20 Ha and 41,000 covering more than 100 Ha.<sup>26</sup>

However, Scotland’s farms are, on average, somewhat larger. Table 5.1 shows English farms to be 23% smaller than the average farm in Scotland, whereas Welsh and Northern Irish farms are less than half the size of a Scottish holding. Removing very small holdings (below 20 Ha) from the figures shows that even the average English farm covers less than half the average Scottish farm.

Table 5.1: Average size of land holdings in the UK

	Average farm size (hectares)	Indexed average (Scotland = 100)
Scotland	113	100
England	87	77
Wales	48	43
Northern Ireland	41	36

Source: DEFRA/DAERA/Welsh government/Scottish government)

The relative size of farms has an impact on farm forestry: smaller farms are disadvantaged by diseconomies of scale. For example, they are very often tenant farms, with tenancies shorter than the rotation of a stand of trees, meaning the tenant will not be present to see profits from the harvested timber. Smaller farms have less land to experiment with and a higher proportional risk if the experiment goes wrong, especially when the ‘permanence’ principle is considered. Small farms also have fewer resources to spare for learning new skills, understanding new grants and regulations and developing new commercial networks. All of these issues help to explain some of the disparities between Scottish rates of afforestation and English, Welsh and Northern Irish rates. A policy response must therefore seek to provide small farms with access to larger organisations that can aggregate the woodland resources across many small parcels of land.<sup>27</sup>

These factors are exacerbated by the precarious state of many UK farms’ finances. Fourteen percent of UK farms failed to make a positive farm income in 2017/18, with just under a third of UK farms managing to make more than £50,000. Such a situation does not lend itself to new endeavours that do not fit easily into established farm patterns.

Both new and existing woodlands can help farmers to improve revenues. If, as DEFRA has proposed, farm subsidies are de-linked from farming

26. DEFRA, Agriculture in the UK 2018, 2019

27. Such aggregators are common in Scandinavia, where membership organisations can include tens of thousands of smallholders who supply wood to large sawmills. For example, Södra is Sweden’s largest association of forest owners and provides 51,000 members with access to common processing facilities, infrastructure and marketing services. In Finland, a co-operative of 100,000 forest-owning families control Metsä Group, which itself runs one of the world’s largest wood processing mills, in Äänekoski. The UK currently lacks many of the supply chain attributes needed for such an arrangement, but the aggregator model is a good long-term aspiration.

outputs and activities and instead focused on delivery of public goods (such as environmental improvements), then farmers will be forced to reconsider their business models. This will include diversification in most cases and fundamental change in others. With 60,000 farm woodlands, of which around 50,000 cover 10 Ha or fewer,<sup>28</sup> there is a huge opportunity to help farms realise new cashflow through better woodland management. This is directly in line with climate targets: the CCC suggests that a 20% reduction in sheep and cattle farming, together with an increase to afforestation of 30,000 Ha per year will be required, meaning that land conversion towards forestry is a key part of the decarbonisation agenda.<sup>29</sup> Farm woodlands are an ‘easy win’ for public policy.

To support farmers and their communities, public policy must ensure that farmers receive appropriate incentives and training for delivering public goods and continued economic output, through a combination of market design and fiscal mechanisms.

Farm woodland and agroforestry are also a matter of resilience. With climate change having a wide range of impacts, business as usual will compound the problem. For example, hotter temperatures can lead to drier soils, which causes wind to blow topsoils away, often resulting in the silting of waterways, which leads to flooding as well as to wildlife loss and low agricultural yields in the fields. Conversely, acting to improve agricultural productivity and natural capital will boost economic outputs and reduce risks. This is consistent with large increases in the value of agricultural outputs through more innovative and efficient approaches, despite the reduction in land used by agriculture. Such a programme of land use change is not, therefore, solely for the purpose of increasing woodlands or even limited to climate change.

This is an opportunity for British farming. Improved land productivity (including long-term sustainability of soils) will increase agricultural outputs, which have been in relative decline over time compared to other developed nations.<sup>30</sup> Developing forestry supply chains will provide several thousand new skilled jobs in the UK’s rural economy and help farms to diversify into new income streams. Through improvements to the rural environment it should also contribute to rural economies through tourism and making the countryside a more attractive, varied place to live. Making agroforestry, small woodland forestry and short rotation forestry crops a financially rewarding part of the standard farm business model should be central to the UK’s post-Brexit agricultural policy.

---

28. Forestry Commission, UK Forestry Standard, 4<sup>th</sup> edition, 2017

29. CCC, Net zero: The UK’s contribution to stopping global climate change, 2019

30. Lightfoot et al., Farming Tomorrow, Policy Exchange, 2018

### Agroforestry



The term ‘agroforestry’ describes the inclusion and use of trees and shrubs as part of a wider agricultural system. Mosquera-Losada identifies five approaches within the system:

- Silvopastoral agroforestry: the combination of trees and livestock;
- Silvoarable agroforestry: the combination of trees and crops;
- Hedgerows, shelterbelts and riparian buffer strips;
- Forest farming: crop cultivation within a forest environment;
- Homegardens: combinations of trees and food production close to homes.<sup>31</sup>

The benefits are similarly varied. Silvopasture can lead to better livestock health, welfare, fertility and productivity as animals are protected from the elements. Soils also benefit from agroforestry, with the use of crop combinations that can support nitrogen fixing and other natural fertilisers, such as tree litter (leaves, deadwood, fruit and nuts), which nourishes soil and improves soil functions. Tree-lined fields can also protect topsoil from wind and excessive water run-off, which also protects nearby waterways from algal blooms and silting. The productivity of one patch of land can also be extended throughout the year, since arable crops and tree crops (e.g. apples) will need harvesting in different seasons. These combined practices lead to productivity improvements and have environmental benefits.<sup>32</sup> The Soil Association also estimates that 1-4 tonnes of carbon per hectare could be sequestered in an agroforestry system.

Dr Duncan Halley, a specialist in Norwegian land management, emphasises the Norwegian concept of Landbruk, a mixed-use approach to land management ingrained in Norwegian agriculture. Despite similarities in geology, hydrology and ecosystems, the two countries have diverged in farming culture. Dr Halley told Policy Exchange:

*“The British and especially the upland British areas are very much exceptions to the rule in the strong tendency towards monocultural use. It might be better to reverse the question, why do the British manage their land in this unusual (and in my opinion suboptimal in economic and other ways) fashion?”*

31. Mosquera-Losada et al, Extent and success of current policy measures to promote agroforestry across Europe. Deliverable 8.23 for EU FP7 Research Project: AGFORWARD 613520. (2016)

32. The Woodland Trust has produced a good general guide on agroforestry, which can be found at <https://www.woodlandtrust.org.uk/mediafile/100822604/agroforestry-in-england.pdf?c-b=1adefb313b1248a19831efe10a97ca4a> The Soil Association has also produced a very practical handbook, including advice for farmers and land managers, at <https://www.soilassociation.org/media/19141/the-agroforestry-handbook.pdf>



Agroforestry is not unheard of in the UK, but is limited to projects that are perceived as pioneering, such as the Dartington Estate.<sup>33</sup> A shift towards agroforestry is listed in the Committee on Climate Change's reports on land use and reaching net zero emissions. It clearly offers a route for greater afforestation of the UK, but depends on the end of the CAP/BPS, which fails to incentivise agroforestry. Cultural changes are also needed among farmers to see the benefits of multiple uses of a single parcel of land, as well as the productivity benefits seen in associated agriculture, such as improved soil quality.

In the mid-20<sup>th</sup> century, the UK underwent two major changes in agricultural policy that moved away from trees on farms. Firstly, the application of the CAP, which does not sufficiently support forestry and allows farmers to avoid making efficiencies on marginal land. As discussed earlier in this report, the CAP's rules actively disincentivise some forms of agroforestry. Secondly, technological changes created larger machines that made trees in fields an obstacle rather than an asset and small fields less manageable than large ones. This increased the removal of hedgerows and farm trees. Both changes also incentivised the almost-irreversible removal of hedgerows in order to create larger farmed areas and production. The addition of 'permanence' to UK forestry policy around the same time also created a barrier to experiments with forestry projects. The aggregate result was a general loss of forestry know-how among (mostly lowland) farmers, rectifying which must be a priority for policy makers today.

To achieve the afforestation, productivity and multiple other benefits of farm trees, policy makers should prioritise agroforestry as a central plank of future British farming and forestry. At the moment, it falls between the two. In the words of the Labour MP Barry Gardiner, agroforestry is "not 'forest' enough for woodland creation grants, but not 'farming' enough for CAP payments." This is borne out in the fact that Scotland, for example, requires a minimum density of 200 trees per hectare to qualify for CAP payments, but agroforestry support applies to much less dense planting (often 75 trees per hectare). Therefore it is not possible to receive both CAP and agroforestry support. Addressing this must be a key part of the policy response.

---

33. <https://www.dartington.org/about/our-land/agroforestry/>

### Recommendation: Agroforestry and farm trees

Government should develop policies to prioritise agroforestry systems, including:

- Hedgerows and trees in hedgerows should be included as a key element of the new ELM payments system;
- Creation of a dedicated unit within DEFRA to support integration of agroforestry into UK farming;
- A sense check against new agriculture policies to ensure they do not disincentivise agroforestry development;
- Creation of a flexible felling licence that allows farmers to experiment with agroforestry schemes without committing to forestry in perpetuity;
- Inclusion of agroforestry schemes within the Carbon Increment Payments plan outlined later in this report.
- Work with farmers' unions to create centres of excellence and knowledge-sharing schemes focused on agroforestry.

### Upland and hillside farms and moors

A particular subset of British agriculture, hill and upland farms should be seen as an opportunity area for land use diversification. Hillside sheep farming often takes place as a result of hillsides being unfit for arable farming – known as 'Less Favoured Areas.' Due to the CAP's BPS being based on the size of a farm, large areas of low-grade, unproductive land are made economic only due to subsidies.

Bare hillsides, lacking investment from environmental schemes and often over-grazed by sheep and cattle, have frequently been associated with poor water management. This contributes to flooding downstream, with sometimes devastating effects for communities.

Sheep also emit high levels of greenhouse gases relative to their societal benefits.<sup>34</sup> A shift away from lamb and mutton in the British diet is suggested by the Committee on Climate Change as an important step towards net zero emissions.<sup>35</sup>

Hillside sheep farming very often relies on public subsidies to remain viable.<sup>36</sup> It should be noted though that sheep farming is not a high-paying lifestyle for the farmers, many of whom are tenant farmers working the land of large estate owners, with tenants complaining that landlords receive too much share of public subsidies.<sup>37</sup> A delegation of upland farmers to DEFRA pointed out that many upland farms struggle to make ends meet and are unable to work on farm-development projects.<sup>38</sup>

The evidence supports this view of unsustainable farm businesses in their current form. The example of Eskdalemuir in Scotland suggests that upland sheep grazing is not economic. A study (comparing forestry with sheep farming) found that forestry was not only more profitable per hectare than grazing, but that it also employed more people and required less subsidy.<sup>39</sup>

A shift from exclusive hillside sheep and cattle grazing towards a diversified model including forestry may lead to better returns for those working the land, better flood management for those living downstream

34. Zero Carbon Britain, 2013

35. CCC, Land use: Reducing emissions and preparing for climate change, November 2018

36. Monbiot, George, The Hills Are Dead, [https://www.monbiot.com/2017/01/04/the-hills-are-dead/#\\_ftn6](https://www.monbiot.com/2017/01/04/the-hills-are-dead/#_ftn6), 2017

37. Uplands Alliance, Creating a Brighter Future Project: Notes from Hill farmers workshop, March 2019, <https://uplandsalliance.files.wordpress.com/2019/06/hill-farmer-defra-18-03-19-meeting-notes.pdf>

38. Uplands Alliance, Creating a Brighter Future Project: Notes from Hill farmers workshop, March 2019, <https://uplandsalliance.files.wordpress.com/2019/06/hill-farmer-defra-18-03-19-meeting-notes.pdf>

39. SAC Consulting, Eskdalemuir: A comparison of forestry and hill farming; productivity and output, February 2019.

and better outcomes in the public interest.

The impending changes to farm payments after Brexit will create a challenge for these farmers (especially fell farmers) and afforestation is an opportunity that could help them to adjust. They should be provided with access to resources, especially expertise, training and infrastructure, to ensure this happens. In addition, upland farmers may benefit from the presence of regional forestry advisers, which might drive forward afforestation schemes and management plans while adding to the local and regional skills base.

The afforestation of uplands is not a one-size-fits-all policy; it should not preclude appropriate environmental assessment and should be seen as one option among several, such as peatland and heath restoration. Focus should be on afforestation of wet mineral soils, rather than carbon-rich peatlands. Yet it is an obvious area for supporting the tree-planting targets supported by stated public policy.

Another opportunity for diversification in the uplands are driven grouse moors. Around 222,000 Ha of upland England are used as grouse moor,<sup>40</sup> with unique land management practices. Grouse eat young heather and shelter under older heather, so grouse moorland managers seek to renew this resource by grazing animals and burning old heather to encourage new growth. Grouse is a particular focus of land management reform because of this specific habitat management for the birds. Deer, partridge and pheasants require less specific regimes.

Grouse moors are designed to support grouse populations for shooting and they have created a rural tourism industry. There is also significant cultural heritage associated with this and the broader hunting, shooting and fishing sectors. Such 'heritage landscapes' are part of a review of National Parks commissioned by DEFRA. However, the specific conditions of such landscapes often come with noticeable environmental costs.

This report takes no moral view on hunting, shooting and fishing per se. Indeed, it would be wrong to ignore the cultural and economic value to rural communities brought by these activities. A community's sense of place is often closely tied to such traditions. Indeed, regulated hunting is a reasonable approach to managing certain populations, such as deer and rabbits, which prevent afforestation and wider biodiversity gains.

Grouse moors are subsidised as agricultural land under the CAP's BPS because they are used for grazing, collectively attracting tens of millions of pounds in subsidy, although the exact sum is unavailable.<sup>41</sup> However, the sector is likely to lose this subsidy and will be forced to consider other uses of land that reflect the environmental priorities of the Agriculture Bill 2017-19. This is likely to include diversification, rather than outright replacement of the hunting sector.

There is therefore a strong case for diversification of land uses in English and Welsh uplands. The managers of these landscapes could be paid for public goods, given their prime position to lead on flood and water management, peatland restoration, afforestation, habitat preservation and tourism (including the game hunting and fishing sectors). These

40. Shrubsole, G. et al., Who Owns England: Grouse Moors, <http://grousemoors.whoownsengland.org>, August 2018, accessed 20 May 2019

41. Full Fact, Does the government subsidise grouse shooting?, <https://fullfact.org/environment/does-government-subsidise-grouse-shooting/>, February 2019, accessed 20 May 2019

uses should not be seen as mutually exclusive: the main criticism of grouse moor management is that it crowds out more sustainable land management. Addressing this exclusivity through meaningful incentives for woodland creation (among other land uses) would help to ensure the future of countryside sports while also delivering significant public goods. As one campaigner told Policy Exchange “we don’t actually know where the tree line is in most moorlands – they’ve been stripped bare for so long.”

Afforesting just 13.5% of English grouse moors would create 30,000 Ha of new woodland, a year’s worth of progress towards the CCC’s afforestation target for reaching net zero emissions by 2050.<sup>42</sup> Using figures from the aforementioned study of Eskdalemuir in Scotland and comparing them to figures available from the Moorland Association, we can derive rough figures for the economic returns of such a project. Commercial forestry operations would create full time employment for 71-93<sup>43</sup> people directly, while grouse moor management over the equivalent area employs 95.<sup>44</sup> Afforestation must be ecologically sensitive. Commercial forestry on peatland should be prevented to avoid damaging drainage of peat, but it can work well on mineral soils. Natural afforestation schemes, such as rewilding, should be supported through the ELMS regime. We discuss elsewhere in this paper how regional Natural Capital Strategies, based on river basins to take account of such hydrological sensitivities, could ensure local priorities such as this could be reflected in the subsidy regime.

Tourism could also benefit from well-managed forests, as it does from grouse moors. A combination of commercial forestry and ‘wilder’ woodlands could support diversification and improvements across a wide range of environmental and economic outcomes.

Importantly, this is not an argument for the eradication of grouse moors or countryside sports, but the diversification of the land through partial afforestation. The large size of the estates that control these moorlands are better equipped to deliver significant afforestation schemes if the right incentives and supply chains are in place at a regional level, as seen in Scotland. There is also evidence that the wider hunting and fishing sectors can benefit from greater afforestation, for example by providing deer with better nourishment and thereby improving deer fertility and survival rates.

---

42. CCC, Net zero: The UK’s contribution to stopping global climate change, 2019

43. Based on SAC Consulting, Eskdalemuir: A comparison of forestry and hill farming; productivity and output, February 2019.

44. Figure derived from 222,000 Ha managed by 700 directly employed staff, as per Moorland Association website: <http://www.moorlandassociation.org/grouse-2/>.

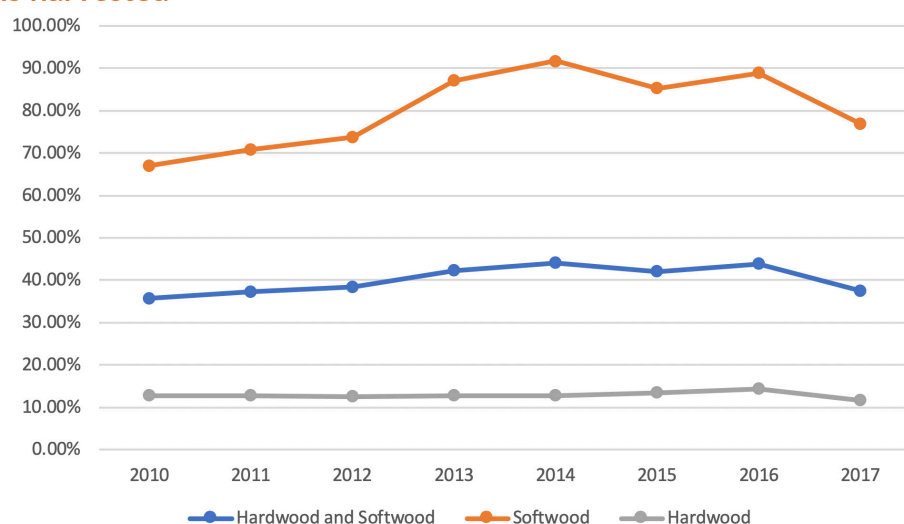
**Recommendation: Support change in upland land management**

Government should implement a number of measures to help hillside farmers to move towards afforestation and other conservation schemes as a route to diversification. Including:

1. The Forestry Commission should create a division focused on woodland as part of the countryside sports industry, identifying opportunities for ecologically appropriate scrub and woodland creation that support game and other populations;
2. Government should work with rural industry bodies to create and co-fund a Rural Skills Transition Fund to help Further Education centres deliver training in conservation techniques, agroforestry and forestry;
3. Develop a package of support measures for the development of forestry infrastructure, nursery investment and investment in machinery, such as low-interest government loans.

## Unmanaged woodlands

**Table 5.2: Percentage of wood growing in English woodland that is harvested**



Source: Forestry Commission

Despite significant recent progress in extending management regimes, around 41% of the UK’s woodlands are under-managed, meaning that there is no active attempt by humans to maximise benefits from the forest, whether in terms of carbon sequestration, biodiversity, timber and wood fibre production or other environmental services. This equates to 1.3 million Ha and represents a very large neglected opportunity to drive carbon sequestration and encourage wildlife. A 2012 government ambition to increase woodland management to two-thirds of British woodlands by 2018, made in response to the Independent Panel on Forestry, was missed. The actual figure at 31 March 2018 was estimated to be 59%.<sup>45</sup> The issue particularly affects broadleaf woodland and the hardwood it produces, almost 90% of which goes unharvested.

45. Forestry Commission England, Annual Report and Accounts 2017-2018, June 2018

### Active forestry brings a range of advantages:

- **Maximising carbon capture**

Forestry can drive constant growth through the harvesting of mature trees, thus creating space for new trees to come through whilst capturing carbon in harvested wood products or displacing fossil fuels. This applies through a range of forestry and woodmanship techniques, including thinning and selective felling mid-rotation, clearfelling at the end of a stand's growth cycle and coppicing. Woodlands without harvesting can often reach a plateau, where tree growth and mortality rates reach equilibrium and so the woodland is no longer a net carbon sink.<sup>46</sup>

- **Increasing timber and wood yield**

Active forestry, by managing access to nutrients, monitoring and responding to infestations or blights and by structuring woodlands appropriately, can increase the amount of wood available for harvest. This includes techniques such as coppicing, which allows repeated harvesting of wood from the same tree and thus lowers disturbance in the forest, although coppicing is not generally appropriate for timber supply.

Improvements in breeding programmes and silviculture over the past half-century have meant that productivity has significantly increased, meaning that more timber growth (and carbon sequestration) can now be achieved with less land. This comes as a direct result of the profit motive – it is the proactive use of research and commercial experience to improve natural capital assets. The result is more carbon stored in a single hectare than could be achieved just 20 years ago. Updating Yield Class models<sup>47</sup> to show these improvements suggests that even modelling conducted by the Committee on Climate Change may be conservative. This means that woodlands may have greater capacity to contribute to achieving net zero emissions than realised.

- **Improving habitats**

Most woodlands in the UK are grown in stands of similar age, meaning that they grow at a relatively uniform rate and, as they do so, close the canopy and reduce light. This makes it a less attractive habitat for shade-intolerant trees and shrubs at the understorey and forest floor levels, which reduces biodiversity. Active forestry can help to mitigate this by clearing closed canopies, allowing light and nutrients to encourage other plants and animals. This is one of the reasons for the UKFS including tree species diversity and differing age groups in plantation forests – they effectively mimic more natural woodlands. It is also a strong reason to protect ancient woodlands from destruction or conversion to more intensive plantation forestry, as they carry such biodiversity

---

46. Zeide, 1987, Analysis of the 3/2 Power Law of Self-Thinning, Forest Science 33(2)

47. Yield classes are used to state the amount of wood grown in a given hectare of land, based on the volume of timber grown per year per hectare. For example, a hectare of woodland in Yield Class 12 would produce 12 cubic metres of timber per year.

traits inherently. Managing such woodlands with carefully applied management plans can help to boost their ecosystem benefits.

It was for biodiversity purposes that a broad alliance of environmental NGOs proactively supported the Forestry Commission's 'Woodfuel Strategy for England'. Groups including Friends of the Earth, RSPB, the Wildlife Trusts, the Campaign to Protect Rural England and the Woodland Trust united to endorse the strategy's aim of sourcing an additional two million green tonnes of woodfuel per year by 2020, as a way of bringing more woodland under sustainable management. The strategy is on course to deliver the target, mostly assisted by the government's Renewable Heat Incentive, as discussed below.<sup>48</sup>

Where tree death does occur, active management can lead to replacement that does not diminish species diversity and can consider the replacement of one species with another that can assume similar ecosystem functions, such as replacing dieback-affected ash with sycamore.

- **Protecting tree health**

Climate change is creating droughts and flooding (both of which can cause tree species to struggle) and greater proliferation of blights and pests. Estimates for the expected total cost to the UK economy of chalara dieback (also known as ash dieback) have reached £15bn, due to the disease wiping out 95% of native ash trees, a higher cost than the 2001 Foot-and-Mouth outbreak.<sup>49</sup> Dothistroma blight is currently preventing planting of Corsican pines and a number of other blights and pests are being monitored. There is a well-documented rise in the incidence of tree diseases affecting British woodlands.<sup>50</sup> If the UK's woodlands remain at such a low level of management, it is likely they will be increasingly vulnerable.

Pests, from oak processionary moth and oriental chestnut gall wasp to vole and deer, can also kill off trees (particularly when young) and reduce timber quality. Performance against the UK Plant Health Risk Register is one of the Forestry Commission's headline Corporate Performance Indicators.<sup>51</sup> The programme has had recent success in eradicating from the UK the invasive Asian Longhorn Beetle which attacks broadleaves such as oak and beech, although this took six years of concerted efforts.<sup>52</sup> A more active and widespread woodland management regime would help to prevent such outbreaks.

There is a clear advantage to increasing the amount of woodland under management. There is also very significant potential and immediate opportunity. Unlike new planting that will take at least two decades to reach maturity (for Short Rotation Forestry at best), bringing woodlands

48. Wildlife and Countryside Link, Position Statement on the Forestry Commission's Woodfuel Strategy, 2009, [https://www.wcl.org.uk/docs/2009/Link\\_position\\_statement\\_Woodfuel\\_Strategy\\_03Jul09.pdf](https://www.wcl.org.uk/docs/2009/Link_position_statement_Woodfuel_Strategy_03Jul09.pdf)

49. Hill et al., 2019, The £15 billion cost of ash dieback in Britain, [https://www.cell.com/current-biology/fulltext/S0960-9822\(19\)30331-8](https://www.cell.com/current-biology/fulltext/S0960-9822(19)30331-8)

50. Read et al. (eds), 2009, Combatting Climate Change: A role for forests, The Stationery Office, Edinburgh

51. Forestry Commission, Corporate Plan Performance Indicators, 2018, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/755628/FC-England-Indicators-Report-2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/755628/FC-England-Indicators-Report-2018.pdf)

52. DEFRA, Asian Longhorn Beetle eradicated in the UK, <https://www.gov.uk/government/news/asian-longhorn-beetle-eradicated-in-the-uk>, 2019, accessed 23<sup>rd</sup> May 2019.

into management can have results within the next few years. The Forestry Commission estimates that over 60 million m<sup>3</sup> of wood, around half of which is softwood and half hardwood, has gone beyond its optimal growth rate, meaning it is mature and ‘overdue’ for harvesting.<sup>53</sup> This indicates that it is not being managed for optimal growth, economic return or carbon sequestration. A report by Grown in Britain suggests that UK woodlands could produce an additional 400,000m<sup>3</sup> every year for 40 years without impacting sustainable supply. It also suggests there is enough sawmill capacity to increase production by 20% in the short term and 100% by 2050.<sup>54</sup>

Evidence from the woodfuel sector suggest that the UK timber and wood markets respond well to price signals. A range of foresters have credited the Renewable Heat Incentive, the government’s subsidy that incentivises use of woodfuel (inter alia), for driving a surge in unmanaged woodland coming under management in recent years. This steep increase in woodland management rates has coincided with a more than five-fold growth in woodfuel, in line with the Forestry Commission’s Woodfuel Strategy for England.

This approach should not be seen as an end in itself; managing more existing woodlands does not automatically lead to more woodlands. It is part of a strategy aimed at increasing the ability of land managers and farmers to see value in woodland and to access markets easily through better developed supply chains. Any new planting will take decades to mature, but it will have short-term benefits in carbon sequestration and supply chain investment.

To help develop the use of hardwoods for joinery and non-structural construction wood (e.g. window frames), better systems need to be in place for assessing the quality of wood in undermanaged woodlands. As noted above, there is a significant volume of available wood and a report by Grown in Britain found that hardwood sawmills have capacity to expand. A key step is therefore the development of management plans for woodlands. These require specialist skills, so government should support training for this and other ELM-related skillsets through a Rural Skills Transition Fund, which should be developed and co-funded with the private sector. Management plans help to improve understanding of the wood stock available in woodlands, with this information filtering through to the market.

Some organisations have created digital tools to help the market aggregate these data. The Sylva Foundation has created a ‘myForest’ app that provides web tools to assess, record and manage woodlands resources, including felling licence applications.<sup>55</sup> Grown in Britain has proposed an online platform to help multiple wood suppliers interact with timber merchants at an aggregated scale, helping them to compete with bulk importers. They have also proposed widespread adoption of timber grading systems, to help create consistency in the market.<sup>56</sup>

Whilst not physical in nature, these initiatives are developing market data and infrastructure and should be supported by government funding

---

53. For more information on MAI, see Matthews et al., *Forest Yield: A handbook on forest growth and yield tables for British forestry*, Forestry Commission, 2016, Edinburgh

54. Grown in Britain, *WoodStock - Final Report*, 2016

55. <https://sylva.org.uk/myforest/home>

56. Grown in Britain, *WoodStock - Final Report*, 2016



and/or tax relief to help develop and market the tools to improve consistency and achieve economies of scale.

### Recommendation: Regional forestry supply chains

To encourage the development of regional timber supply chains, government should:

- Provide ongoing support for the woodfuel sector through greater certainty for the Renewable Heat Incentive and a ban on new fossil fuel boilers after 2025, similar to measures taken to encourage electric vehicles.
- A Rural Skills Transition Fund, co-funded with the private sector and accessible to Further Education centres, to develop regional skills bases in forestry and other environmental land management systems;
- A Timber Infrastructure Package for England and Wales, with funding and tax reliefs for capital investments, infrastructure improvements and digital tools that develop forestry supply chains.

# Rewarding Value in Trees and Wood

## Section summary

- Trees offer wood products and valuable landscape services. Both should be supported through markets and fiscal incentives.
- A new policy framework should include Natural Capital Strategies (formulated by regional authorities) to apply national afforestation and other targets at a regional level.
- The new ELMS programme should include 'stackable' contracts to allow land managers to realise the value of multiple services but without excluding commercial wood harvesting. This would encourage multi-functional mixed woodlands.
- A key revenue stream for all afforestation projects should be a Carbon Increment Payments system (CIPs) which would use government revenues from carbon offset sales to provide annual payments to landowners in line with a management plan.
- UK-grown wood products should be incentivised through a tax on embodied carbon in new buildings and a target for 40% of new buildings to be timber framed by 2025.
- Wood supply chains should also be developed through support for management plans, funding and tax relief for infrastructure (both physical and digital), skills funding and support for the woodfuel sector.

Most of the controversies in tree policy arise from the impressive range of goods and services that trees provide. Box 6.1 sets out some of these products and services. With land in short supply, there are many stakeholders, including environmental NGOs, heritage campaigners, water companies, farmers, local communities and commercial foresters. These groups often have conflicting interests, despite a general consensus that trees are a net benefit in most settings.

In order to develop a coherent policy approach, it helps to rationalise the value of trees, splitting them into two broad value categories of 'goods' and 'services', as per Table 6.1.

Table 6.1: Arboreal value: goods and services

Value in Tree goods (mostly harvested trees)	Value in Tree services (mostly living trees)
<b>Harvested wood products</b> 1. Construction timber (structural) 2. Construction wood (non-structural, fencing, panels, etc.) 3. Non-construction wood products (e.g. packaging) 4. Carbon sequestered in harvested wood products <b>Energy markets</b> 5. Energy market feedstocks (wood fuel) <b>Other wood derivatives</b> 6. Biorefinery feedstocks <b>Tree produce</b> 7. Fruit, nuts, sap and other produce	<b>Carbon sequestration</b> 8. Carbon in tree biomass 9. Carbon in soil, deadwood and litter 10. Carbon in tree-supported species
	<b>Environmental regulatory services</b> 11. Habitat provision 12. Air quality regulation 13. Water quality and management (flood & filtration) 14. Soil maintenance
	<b>Socio-economic benefits</b> 15. Livestock protection 16. Visual amenity improvements 17. Setting for tourism and outdoor pursuits
	<b>Policy focus:</b> Support clear markets and fiscal mechanisms for ELM and natural capital investment.
<b>Policy focus:</b> support growth in market demand for sustainable tree products.	

Crucially, one stand of trees might provide a wide range of these valuable goods and services. However, there is a lack of clarity in how these are balanced. For example, a commercial forester might propose a new plantation, yet be held to standards more reflective of a biodiversity-enrichment project, making it difficult to deliver the owner's objectives. Conversely, those seeking to create nature reserves are likely to find no commercial market for their project, making it financially unviable despite its obvious credentials as a public good. In all of this it has become common to hold afforestation projects to mismatched standards and to treat every proposed afforestation project as a 'jack of all trades' but without the respective revenues for delivering multiple services. The result has been a confused mix of disjointed policy approaches. Rewarding each service individually would encourage mixed woodlands with multiple functions.

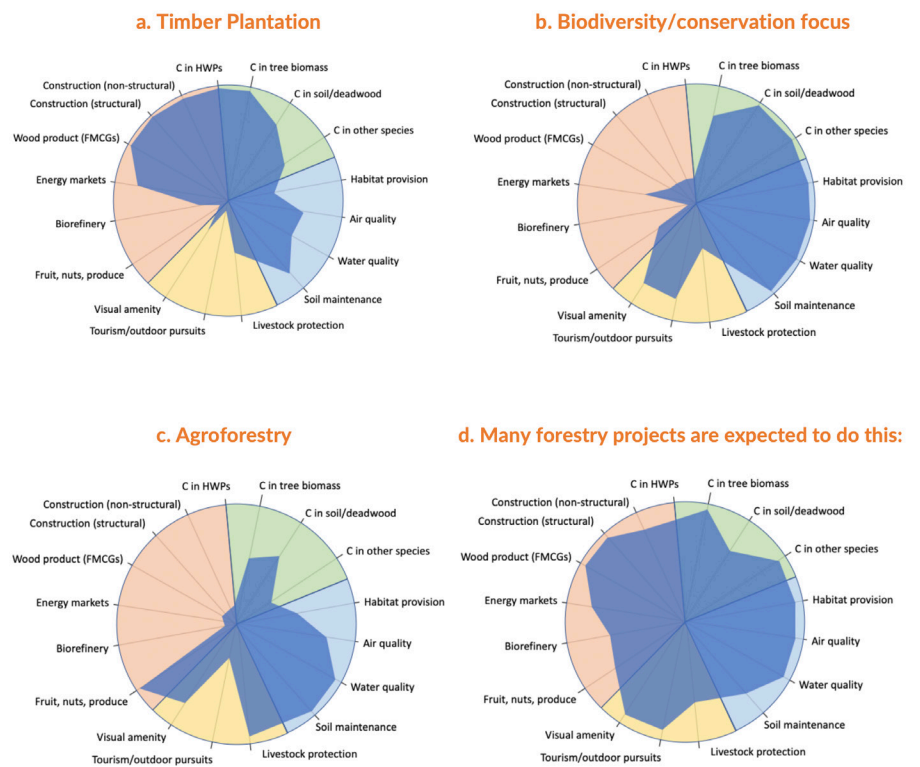
Such mixed woodlands and variation across woodlands are not just a 'nice to have', but are fundamentally important. Limiting UK woodlands to any particular management technique or to a dominant species creates vulnerabilities. Recent drops in timber value as a result of a Europe-wide disease in softwoods has demonstrated the brittleness of the sector. This undermines not only biodiversity, but carbon sequestration in the landscape. Largescale tree death due to poor design or management can create carbon sources in the LULUCF sector, whereas diversification can protect against it and ensure a net carbon sink. Public policy should therefore prioritise diversity by allowing 'stackable' revenue streams from tree-related ELMS on the same parcel of land.

Figure 6.1 maps out some indicative examples of projects with different focuses and therefore different forms of value. The value maps provide

a ‘score’ under each main category; the closer to the centre, the lower the score. They are designed to show the variety involved in different afforestation projects.

Importantly, the maps treat each category as equally valuable and do not attach a financially-weighted value, which does not reflect reality. Markets should decide the value of goods and some services, whereas public policy must attach a value to the rest.

**Figure 6.2: Hypothetical value maps for different approaches to forestry.**



Numerous policy approaches have tried to achieve a balance between these competing demands through regulation. For example, the UKFS sets forest design standards to ensure that certain requirements are met by all afforestation projects. These apply whether the afforestation is for commercial or environmental purposes. DEFRA’s 25-Year Environment Plan, including elements such as the Environment and Agriculture Bills, seeks to set the principle of ‘public money for public goods’ into environmental policy through ELM payments. This creates potential markets and subsidies for a range of ‘tree services’, effectively balancing this column with the ‘tree products/goods’. Both of these approaches are welcome additions to public policy.

**Recommendation:** The government's tree strategy should set out clear policy priorities that reflect the products/services value range of trees. We recommend the following objectives:

1. Public policy should seek to create market demand for sustainably harvested wood products in order to stimulate investment in the forestry sector;
2. Public policy should reward the ELM services provided by living trees.

## Objective 1: Stimulating demand for Harvested Wood Products

Sustainably harvested wood products provide two key benefits. Firstly, they provide a sustainable revenue for forests. This incentivises investment in effective management of the forest and incentivises land use change towards agriculture or development.

Trees that are harvested when they reach maturity ensure continual growth in a forest through replanting (enforced through the Forestry Commission's conditional felling licences), feeding a stream into a growing pool of carbon storage in harvested wood products. This wood pool does not last forever and different products have different lifetimes, but its displacement of high-emissions alternatives is effectively permanent.

The environmental benefits of wood in construction are significant. A 2010 meta-study found that replacing steel and concrete with timber in construction projects delivers 0.75-1 tonne of CO<sub>2</sub> savings per cubic metre of timber.<sup>57</sup> This is because steel and concrete manufacturing releases significant greenhouse gas emissions, whereas growing timber is a net sink. There are transportation benefits too, due to wood's lighter weight. Houses also have very long product lifetimes.

Advances in wood engineering and construction techniques are supporting a revival in British grown wood for construction, making it useful for a wider range of purposes. Construction is the largest sector for timber end use and the relatively low rates of (especially UK-grown) timber use in English, Welsh and Northern Irish construction sectors demonstrates an opportunity for growth. In addition, timber in buildings delivers much longer-term sequestration of carbon. It should, therefore, be a focus for the UK's forestry policy.

Cross Laminated Timber (CLT) is a modern construction material in which layers of timber are glued together with alternating directions of the wood fibres. This creates a stronger beam of wood with less tendency to warp. Another popular form of engineered timber is 'GluLam', or glued laminated timber, which similarly increases strength and offers more options for timber design, such as curved arches. These technologies are making it possible to build significantly taller buildings. A 1,000 ft tower is being proposed for a site in central London and would be London's second tallest building after the Shard. Engineered wood offers comparable structural performance to steel or concrete, but with a fifth of

57. Sathre, R and O'Connor, J, Meta-analysis of greenhouse gas displacement factors of wood product substitution, Environmental Science & Policy, January 2010

the weight.<sup>58</sup>

In construction, there is increasing demand for modular and off-site fabrication of building units in response to the housing shortage. Homes can be built as modular units in a factory before being transported to site. This can dramatically improve safety, efficiency and choice of building materials as it lowers the complexity of a construction project. It also makes it conducive to using wooden panel boards as unit walls. The system is seen as a major part of the solution to the housing shortage as it offers several cost-cutting benefits. A factory run by the housebuilders Countryside in Warrington is expected to build 1,500 homes each year.<sup>59</sup>

Timber also offers an opportunity to improve the aesthetics of buildings with locally-sourced wood and modern techniques such as laser cutting that allows artisan-style features without the traditional costs.<sup>60</sup> Timber has a central role to play in the work of the government's Building Better, Building Beautiful Commission, an issue on which Policy Exchange has written extensively.<sup>61</sup>

One of the most recent challenges is a change to building regulations in response to the Grenfell Tower tragedy and other fire-safety concerns. The use of combustible materials in the external walls of buildings taller than 18 metres is now banned.<sup>62</sup> The figure of 18m appears to be somewhat arbitrary and adds to the prospect of twin-track building regulations around timber, as well as contributing to confusion in timber construction. This is undermining demand for timber until regulations are clarified.<sup>63 64</sup> Despite these concerns, it appears possible to deliver timber-framed and timber-walled buildings that also have high fire-safety standards.

Restoring confidence in timber so that architects, construction firms and developers feel able to build more with it should be a priority. To do so, government should set out new testing standards for timber buildings that allow them to prove their ability to withstand and control fires. When the results of approved, robust fire-safety tests are made publicly available and standards set to reflect their findings, industry will be able to use timber with greater confidence.

### Recommendation: Restoring confidence in timber in buildings

In order to restore confidence in timber buildings, the Ministry of Housing, Communities and Local Government should develop a system of fire tests for all timber frames and walls. These should provide the backbone for new, clear standards that can be understood by non-timber-specialists, to be set into building regulations and guidance for the architecture and construction sectors.

The timber-construction sector should work with government to ensure such standards are set in place and applied across products and services to ensure confidence in all timber construction, not just that below 18m.

Aside from regulatory uncertainty around external walls, structural timber (e.g. timber frames) is still a highly attractive option. Demand is rising slowly in this sector and Scotland again leads in uptake.

58. Leake, Jonathan, Wooden skyscraper to become a greener Shard, June 2019

59. Champ, Hamish, Countryside's modular timber frame factory in full swing, Housing Today, April 2019

60. For a further discussion on this, see McAleenan, Benedict, Rediscovering Natural Beauty in the Built Environment, in The Duty to Build Beautiful, Policy Exchange, 2019

61. <https://www.gov.uk/government/groups/building-better-building-beautiful-commission>

62. Marshall, Jordan, Cladding ban details suggests CLT will be outlawed, <https://www.building.co.uk/news/cladding-ban-details-suggests-clt-will-be-outlawed/5096844.article>, January 2019, accessed 7 June 2019

63. Housing Today, Regulatory uncertainty prompts Lendlease to put CLT plans on hold, <https://www.housingtoday.co.uk/news/regulatory-uncertainty-prompts-lendlease-to-put-clt-plans-on-hold-/5098412.article>, March 2019, accessed 7 June 2019

64. Housing Today, CLT ruling sends Swan back to drawing board on high-rise, <https://www.housingtoday.co.uk/news/clt-ruling-sends-swan-back-to-drawing-board-on-high-rise/5097522.article>, January 2019, accessed 7 June 2019

**Table 6.3: Timber-frame housing starts (Source: Structural Timber Association/MHCLG)<sup>65</sup>**

	Timber frame share of all housing starts	Housing starts
Scotland	83.00%	19,650
England	22.40%	160,180
Wales	30.70%	6,040
Northern Ireland	17.40%	7,520
UK	28.40%	193,380

The UK government’s target is 300,000 new houses per year – considerably more than the current delivery, though building is on a medium-term upwards trajectory. The BioComposites Centre at Bangor University estimates that a new timber frame house can save 1.7-3.2 tCO<sub>2</sub>e by displacing high-emissions materials such as steel and concrete and store an additional 2-4.2 tCO<sub>2</sub>e in the timber itself. In its high timber-use scenarios (which depend on achieving the government target of 270,000 new homes per year), the UK could store an additional 1.3 MtCO<sub>2</sub>e per year in timber housing. Under this scenario, the saved emissions from concrete and steel could deliver another 0.48-1 MtCO<sub>2</sub>e saving per year. There is even greater potential in the non-residential sector, which uses less timber.<sup>66</sup>

As Policy Exchange has argued, improving the attractiveness of new housing is likely to improve its acceptability and thereby lower barriers to new planning applications.<sup>67</sup> A thriving housing market would provide the demand-side stimulus as well as create the incentives for much wider tree planting.

Some local authorities have led the way by implementing a ‘timber first’ planning policy. Hackney Council became the first local authority to adopt such a policy in 2012, albeit emphasising that its focus was on sustainable and local sourcing. This appears to be the most sensible approach, as ‘timber first’ may preclude consideration of other factors, such as local sourcing or recycled materials, as well as more technical design concerns. It should be encouraged by the Ministry for Housing, Communities and Local Government through the creation of guidance and training for local authorities considering such an approach. However, it should not be seen as the right approach for the whole UK given the variance in architectural vernaculars, local supply chains and alternative local building materials.

An ‘embodied carbon’ policy that reflects the carbon emissions involved in the construction of a building, including materials, transport and construction methods, may be highly effective in creating demand for UK-grown wood. This would depend on clear methodologies being adopted to reflect embodied carbon without adding overly burdensome bureaucracy to new home building. Such methodologies already exist.<sup>68</sup>

65. Egan Consulting, Annual Survey of UK Structural Timber Markets 2016, Structural Timber Association

66. Spear et al, Wood in Construction in the UK: An Analysis of Carbon Abatement Potential, BioComposites Centre, Bangor University, 2018

67. See <https://policyexchange.org.uk/housing-and-planning/> for a range of reports and commentary.

68. For example: <https://www.fgould.com/uk-europe/articles/embodied-carbon-guidelines/>

Work for the CCC by AECOM, a consultancy, suggests a two-step process towards implementing such a policy. Firstly, elemental materials (such as structural components) should be included. Then, once this system is established, whole-building assessments can be delivered.<sup>69</sup> AECOM recommends using regulations and emissions limits to achieve this, but it would be better achieved through a carbon-pricing mechanism to allow market innovation. The government should work towards applying a differentiated carbon price (i.e. starting low but with an upwards trajectory) to help the construction industry plan for, and invest in, low carbon modern methods of construction.

### Recommendation: Encouraging timber in buildings

Ministers should set a target of 40% of all housing starts in England, Wales and Northern Ireland to be built with timber frames by 2025. Commensurate targets should also be set for non-residential homes and construction projects commissioned by the public sector.

MHCLG should create a Timber in Buildings taskforce to deliver the target, including:

- Working with industry to develop new fire-safety standards for all timber in buildings;
- Building better understanding of the advantages of timber in buildings;
- Producing Planning Policy Guidance to support timber's place in planning policy and work to ensure timber is referenced in the National Planning Policy Framework as a key raw material where relevant.

Government should seek to incentivise the use of UK-grown timber by recognising embodied carbon in buildings. This should be achieved through:

#### 1. Planning policy

Local authorities should be encouraged to adopt policies that prioritise sustainable materials through design frameworks.

#### 2. The UK's future carbon pricing mechanism

The UK's post-Brexit carbon-pricing mechanism should include the construction sector, with a low-but-rising sector-specific carbon tax to incentivise low-carbon materials.

### Bioenergy and biorefinery feedstocks

Wood is an increasingly important source of fuel, predominantly for heat in off-grid boilers, but also for small and medium-scale combined heat and power (CHP) facilities.<sup>70</sup> Bioenergy has grown significantly as a wood market in the UK, replacing off-grid fossil fuel-based heating such as oil. This brings two benefits for the rural economy: woodland management and farm diversification.

Another developing sector for wood supply is in biorefinery. This sector presents an extremely broad range of possibilities using the component materials in wood and refining them for other uses. This offers an opportunity to displace petrochemicals, but with a sustainable

69. AECOM, Options for incorporating embodied and sequestered carbon into the building standards framework, 2018

70. Larger biomass-fired power stations tend to use imported feedstocks.



raw material that can have biodegradable properties. Everything from cosmetics to food to bioplastics can be manufactured and demonstration projects are underway, such as the Sweetwoods project in the forest-rich Baltic region.<sup>71</sup> As with bioenergy, care must be taken to ensure sustainable supply. Full lifecycle considerations such as end-of-life disposal are also still important to avoid future problems such as that with plastics.

However, the sector could improve efficiency in wood use by making further use of the low-grade co-products from forestry and timber processing, as with the woodfuel sector.

The first advantage of these markets is to create demand for low-specification wood, providing an incentive to manage woodlands in the absence of higher-grade wood industries such as construction timber. In the words of one Forestry Commission staffer, “without energy markets, management of broadleaf woodland would grind to a halt from an already low level.”<sup>72</sup> Woodfuel’s benefit to the energy system is that it is renewable, with emissions reabsorbed by regrowth. Work commissioned by the European Climate Foundation offered a set of principles on which to base sustainable sourcing policies for bioenergy, which its authors noted appears to be in line with UK policies and was included in the CCC’s work on biomass in a low-carbon economy.<sup>73 74</sup>

The second advantage is in diversifying crop options for farms in a post-Brexit agricultural sector. This is particularly helpful in cases of marginal land no longer covered by the protective Basic Payment Scheme. Bioenergy crops are often more tolerant of poor quality soil than food crops. Willow has shown particular usefulness in areas prone to flooding as it still prospers despite ‘soggy feet’. In Scotland, Short Rotation Forestry has gained in popularity over Short Rotation Coppice as the latter appears to require higher grade soil, similar to that required for food crops but with a lower financial value. However, this leaves a range of other options.

71. <https://sweetwoods.eu>

72. Correspondence with Policy Exchange.

73. Matthews, R., Hogan, G. and Mackie, E. (2018) Carbon Impacts of Biomass Consumed in the EU. Supplementary analysis and interpretation for the European Climate Foundation. <https://europeanclimate.org/wp-content/uploads/2018/05/CIB-Summary-report-for-ECF-v10.5-May-20181.pdf>

74. Forest Services, Biomass in a low carbon economy (CCC), Annex 1, November 2018



A combined heat and power bioenergy plant at Sandwich in Kent, developed by Estover Energy Ltd, is a good example of providing both of the above services. The South East of England has abundant wood resources that are undermanaged with minimal infrastructure and incentive available. It is also the former home of a large paper mill at Sittingbourne, which went out of business in 2007 after operating for most of the 20th century. By providing a revenue for the region's woodlands, the biomass plant is helping to keep them in better management in the absence of the mill. It also sources extensively from sweet chestnut Short Rotation Coppice plantations, which would have supplied the mill too, offering farmers revenue for alternative uses of marginal land.

A Wood Fuel strategy was developed in 2008, with the target of sourcing an additional 2 million green tonnes per year for the energy market by 2020. This is likely to reach its target due to the presence of the Renewable Heat Incentive. The scope for expansion in domestically-sourced feedstocks is considerable, given the supply-side opportunities and the continuing demand-side need for off-grid low-carbon heat. However, this is stalling due to uncertainty in policy. The REA, an energy trade body, has called for policy clarity through extending the Renewable Heat Incentive and/or replacing it with a new mechanism (such as a heat 'feed-in premium'). Ministers could also impose a ban on new fossil-fuel boilers from 2025, similar to the 2040 ban on internal combustion engines, to encourage electric vehicles.

A third potential opportunity lies on the demand side, with biomass as a possible feedstock for 'green gas' and related biorefinery products. Technologies are nascent and the market is undeveloped, but they present very large potential. Gasification of biomass might also provide a by-product, biochar, which can help to regenerate soil fertility.

Whilst there is a range of policy options for stimulating demand in the bioenergy and biorefinery sectors, these are mostly outside the scope of this report. However, the principle of raising demand for wood products should be seen as beneficial to woodlands, assuming effective sustainability regulations.

Trees grown for bioenergy markets could provide a 'gateway' crop to help more farmers move into forestry. It would help them to understand

the forestry sector, build contacts and skills and thereby encourage them to move into other forms of tree management. It could create new feedstocks and lessen any pressure on existing woodlands.

A supply-side challenge lies in the current design of felling licences. Felling licences from the Forestry Commission are required if a landowner plans to cut down more than a certain volume of wood within a given area. Designed to prevent deforestation, felling licences are usually granted on the condition that land will be replanted with more trees. This effectively means farmers converting land to woodlands should expect not to return it to agricultural uses.

Both the National Farmers' Union and individuals within the forestry sector suggested to Policy Exchange that the concept of 'permanence' may be preventing the conversion of land to forestry uses. It creates a long-term risk for farmers, who may lose agricultural land in perpetuity if they decide to try forestry. In the case of tree crops for bioenergy, which can be planted and harvested much more regularly, greater flexibility would allow farmers to diversify their output by experimenting with bioenergy on marginal land. Short Rotation coppicing of willow has a typical rotation of three years. Short Rotation Forestry with species such as eucalyptus (10-year rotation), alder and aspen (15 years) or birch and sycamore (20 years) could be seen as 'gateway' projects that support a transition towards forestry for the farming community. De-risking this transition for farmers by relaxing replanting conditions would likely create net positive afforestation, even if some farmers did decide to return their land to agriculture. Often this may not be needed as smaller trees are exempt from the requirement for felling licences, but clarity would help farmers' decision making.

One solution may be the creation of a special class of Short Rotation felling licences, whereby agricultural land afforested with particular species after a certain year (e.g. 2019) may be felled without restocking of trees. These flexible felling licences might also apply to agroforestry, a practice to be discussed below.

#### Recommendation: Flexible Felling Licences

Government should pilot new felling licences specific to Short Rotation Forestry and Agroforestry, allowing the land to return to non-forestry if a landowner decides to. Such licences should only apply to new projects planted after the policy's introduction.

## Objective 2: Reward the Environmental Land Management services provided by living trees.

Table 6.1 above sets out 10 services offered by trees in the landscape (although this list could be expanded or contracted). These services can broadly be split into three groupings: carbon sequestration, environmental

services and socio-economic benefits. In each category, there are some markets and support mechanisms, but none provides a market signal strong and clear enough for widespread tree planting at the scale required. Arguably, carbon sequestration and environmental services both fall to the ‘tragedy of the commons’ – i.e. many stakeholders benefit from these services, but few invest in their maintenance and so conditions worsen or resources are depleted over time.

It is already public policy to create revenue streams for many of these public goods. It is likely, for example, that contracts will be issued under the government’s new ELM scheme that will pay land managers to improve soil quality or to manage water more sustainably. In both cases, trees are likely to be employed as solutions. It is certainly likely that large numbers of trees will be planted and managed in line with such incentives, but it is far from clear that afforestation will be sufficient for broader public aims.

The key driver of the 30,000 Ha per year afforestation target is climate change. The figure was arrived at by the CCC for the purposes of maximising carbon sequestration, which should therefore be the overall priority in afforestation policy at the national level.

However, the CCC’s 30,000 Ha target is largely ‘quality agnostic’, i.e. it aims for a particular quantity, not type or quality of afforestation. As discussed elsewhere in this paper, the problem of ‘the right trees in the right places’ is important. Unwise afforestation brings ecological, hydrological and societal problems. On the last of these, it is important that communities accept afforestation as a net benefit, which is less likely if they feel one forestry approach has become dominant in the landscape. Opposition to sitka spruce timber plantations is the obvious example, albeit often unfairly. Beneath the umbrella target of 30,000 new hectares must be a number of measures designed to deliver ‘quality’ as well as quantity.

ELM contracts should help to steer this, incentivising tree uses that reflect ecological or human amenity services that would not be compatible with particular forms of forestry. For this reason, it is very important that ELM contracts be allowed to include more than one environmental service within a contract and to run alongside the Carbon Increment Payments system outlined below. It should be possible for a land manager to receive payments for several types of service, as well as selling produce on the market. However, there is no clear framework for applying this in a localised way. Environmental priorities will be different in East Anglia compared to the Scottish Highlands, for example.

The multiple services offered by trees will also vary from landscape to landscape. The dense population of the Thames Valley might mean prioritising woodlands for amenity and air quality purposes, which might suggest afforesting large swathes of the London Green Belt. Southern Scotland might choose instead to focus on the carbon sequestration potential of commercial forestry. Parts of Northern England might prioritise moorland peat restoration and natural woodland seeding in order to prevent downstream flooding.

A framework for ELMS could take the form of Natural Capital Strategies.

Operating at a river basin district level, NCSs would set out priorities for natural capital improvements and targets to be achieved within these priority areas. They would effectively apply the policies of the 25-Year Environment Plan at a regional level.

Within such a framework, contracts for ELM would be strategic and geographically appropriate. Landowners would have the assurance that certain priorities had already been set out by the Natural Capital Strategy before applying for afforestation grants (among other things). They could therefore bid for contracts and funding for ELM projects that deliver NCS outcomes. They would include some key features:

### 1. Locally applied national targets

Targets such as ‘30,000 Ha new afforestation per year by 2030’ are very difficult to apply at a national level. One region might have far greater potential for afforestation, whilst another might be more suited to peatland restoration. The Natural Capital Strategies would translate such targets to a regional level, considering which areas have greater capacity to deliver.

### 2. Priority thematic outcomes

A key feature of Natural Capital Strategies should be a focus on outcomes, such as improved water or soil quality, rather than inputs such as particular types of woodlands prescribed for particular localities. This helps to avoid creating a prescriptive planning system for the countryside, which would limit innovation, entrepreneurialism and private property rights. The system should be designed to enable rather than prevent positive land uses.

### 3. Spatial priority areas

Strategies should avoid making spatial prescriptions to avoid arbitrary constraints. However, if a particular area is prone to flooding, this could be included as an opportunity within the regional Natural Capital Strategy and funding offered for solutions such as upstream afforestation.

#### Recommendation:

Create a system of Natural Capital Strategies covering each river basin district respectively. Task the Office for Environmental Protection with monitoring progress against these strategies.

## The case for a Carbon Increment Payments system (CIPs)

Under the current system, a farmer who decides to plant broadleaf woodland on a 10 Ha site (an eighth of the average English farm) can expect to make losses on the land for years (notwithstanding grants to cover costs and income foregone), until occasional thinnings (every 5-10 years) and a final harvest create returns. Table 6.4 shows a selection of mainstream crops and their typical gross margins per hectare per year. Commercial softwood forestry is reasonably competitive, but broadleaf

(not featured on the table) is not. The various contextual challenges such as lack of cashflow make it harder for forestry to compete.

**Table 6.4: Gross margins on a selection of typical British crops and pasture (Source: John Nix Pocketbook)<sup>75</sup>**

Crop or land use	Typical gross margin[1]
Durum wheat	£890
Barley (winter feed barley)	£609
Oats (winter and spring oats)	£551.50
Oilseed rape (winter and spring)	£715 and £464
Peas (blue peas)	£616
Soya	£653
Potatoes	£1,534
Onions	£4,516
Cauliflower	£1,091
Dairy cows	£1,812-1,999
Beef cows (autumn calving, lowland suckler)	£274
Sheep (lowland Spring lambing ewes)	£478
Sheep (upland spring lamb)	£352
Short rotation coppice (willow/poplar)	£296
Long rotation (35 yrs) sitka spruce	£777 (paid upon thinnings/clearfell) [2]
Dessert apples	£6,392
Figures for pigs and poultry are not available by hectare as these are not usually grazing livestock. Figures do not include farm overheads and BPS.	

[1] Average gross margin per hectare per year, taken from Enterprise data in Redman, G, John Nix Pocketbook for Farm Management, 2019

[2] This figure is not from Nix, but Harris, Eleanor, Benefits of a 20Ha farm forest, Confor, 2017

To be competitive with agriculture, forestry must deliver annual gross margins in the range of £450 to £2,000. Forestry does so only when measured over a 25-35 year growth cycle, usually through commercial conifer forestry. It should therefore be a policy objective to make forestry competitive with agriculture on an annual or semi-annual basis.

### Carbon Increment Payments

The most obvious and measurable annual increment in forestry is the sequestration of carbon and other nutrients to produce wood. Around half of the volume of dry timber is carbon so as a tree grows its carbon store also grows. A carbon increment payment (CIP) would recognise this year-on-year growth and provide annual income for a woodland manager, solving the cashflow problem in return for the real-world benefit of

75. Figures do not include the CAP Basic Payment or other subsidies.

carbon sequestration.

A CIP would be made to a land manager for the carbon sequestered on their land in a given year. Land managers would agree five-year plans with the Forestry Commission or a relevant authority. Payments would then be made annually to the land manager, in line with pre-agreed management plans for a given afforestation project.

This system would be flexible enough to be applied to agroforestry, timber plantations, riparian buffers, a hillside plantation to improve water catchment or even a nature reserve (among other options). Management plans would include harvesting during and at the end of rotations, with Carbon Increment Payments affected according to carbon removed from the woodland.

Woodland stands that are ‘overdue’, i.e. they have slowed their growth and are potentially losing their role as a net carbon sink, would have a reason to be brought back into management if a carbon increment was available, though this would need to allow for an initial drop in carbon stocks due to thinnings (for example by making an averaged carbon payment for the establishment of a management plan, covering its first 10 years).

To ensure a light-touch but effective audit system, drones and satellites should be used once each year to look for possible breaches of the tree management plan. Where these might have occurred, follow-up investigations would be required on site. Otherwise, an in-person check-up would be required only every 3-5 years to ensure the management plan is being followed. Adjustments could be made to management plans over time to reflect actual carbon sequestration. Audits could be conducted by independent contractors, rather than Forestry Commission officers.

Such a system would be independent of other payments for environmental services, allowing a farmer to receive ELM payments for establishing a new shelterbelt to preserve soil quality on their fields, but also receive payment for the carbon sequestered by the shelterbelt. This would help to improve the competitiveness of such schemes and incentivise environmentally focused management plans, helping to prevent unnecessarily intensive tree planting schemes.

### Existing carbon payments

**Government has begun to support this concept in three forms already:**

- The **Woodland Carbon Code**, exists to enable companies to offset their greenhouse gas emissions by ‘buying’ carbon in woodlands. The Code provides assurance to offsetters that woodlands are being managed in accordance with their carbon agreements. It has been operating since 2011 and includes 239 schemes, which cover an area of 16,125 hectares and are expected to sequester a combined 5,788,000 tCO<sub>2</sub>e over the next 100 years.<sup>76</sup> It is reliant on bilateral contracts between polluters and woodland owners.
- The **Woodland Carbon Fund** provides grants of £1,000/

76. Forest Research, Forestry Statistics 2018, March 2018

Ha to cover some capital expenditures for the establishment of commercially productive timber woodland. The focus is on larger plantations with more capacity for carbon capture, making it unhelpful for afforesting much smaller holdings.

- There is also a **Woodland Carbon Guarantee**, a £50 million government fund designed to guarantee land managers an income over 30 years by buying the carbon credits in their afforestation schemes. This is a positive move, but limited in scope and funding.

The EU's Emissions Trading Scheme currently places the price of carbon around £25/tCO<sub>2</sub>, although it plummeted in 2009 as a result of the financial crash and has only risen above £10/tCO<sub>2</sub> since early 2018 due to policy interventions.<sup>77</sup> The UK props it up with a 'Carbon Price Support' mechanism (CPS), currently set at £18/tCO<sub>2</sub>, making the total current price around £43 per tonne of CO<sub>2</sub>. The price of carbon is rising rapidly and is likely to continue upwards.

However, the Woodland Carbon Code is based on bilateral contract negotiations, not the EU ETS. The ETS covers high-emissions such as power, manufacturing and airlines, but not forestry and other land uses. The bilateral negotiations therefore do not have to reference the ETS carbon price, nor the UK's Carbon Price Support. Currently, Woodland Carbon Code prices suggest around £5-10 per tCO<sub>2</sub>, which is both far below the combined ETS/CPS and also the social cost of carbon as calculated by the Department of Business, Energy and Industrial Strategy.<sup>78</sup> Brexit, combined with the new UK target of net zero emissions by 2050, presents an additional opportunity to address this.

The UK currently proposes to replace its membership of the EU ETS with its own Emissions Trading System, which would be aligned with the EU's, though details are still limited on the proposals.<sup>79</sup> Either way, carbon pricing is likely to rise throughout the 2030s and the government's new target of net zero emissions by 2050 make a much higher carbon price all but necessary.

Work by the London School of Economics Grantham Institute recommends the creation of a 'negative emissions' market in which all polluters and net-negative services could participate, ranging from BECCS and other CCUS technologies to land uses including afforestation. It suggests a shadow carbon price trajectory for net zero emissions in 2050 that rises from around £45/tCO<sub>2</sub> today to over £160/tCO<sub>2</sub> in 2050. If applied to land sector offsets, such a system would help to incentivise low-cost methods such as afforestation, before moving on to more technological and expensive options as the carbon price rises. Carbon Increment Payments would fit within such a context as an early, no-regrets option for negative emissions.<sup>80</sup>

To prevent a high carbon price making CIPs too powerful (i.e. drowning out other ELMS payments), they could be capped either at a particular carbon price or at a payment per hectare.

Using the Woodland Carbon Code's carbon lookup tables and calculator

77. The price is dependent on demand for emissions permits remaining high. The economic crash lowered demand, created a surplus of supply that crashed the price of carbon.

78. For a full set of appraisals and methodologies around the various ways of costing carbon, see <https://www.gov.uk/government/collections/carbon-valuation--2#update-to-traded-carbon-values-2018>

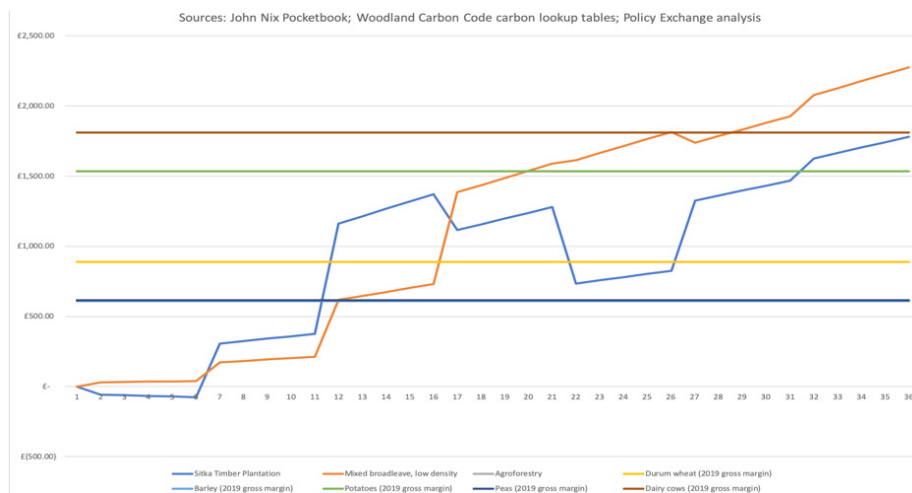
79. In the event of a 'no deal' exit from the EU, a short-term carbon tax has been proposed to prevent the cost of carbon dropping: <https://www.gov.uk/government/publications/meeting-climate-change-requirements-if-theres-no-brexite-deal/meeting-climate-change-requirements-if-theres-no-brexite-deal>

80. Burke et al, How to price carbon to reach net-zero emissions in the UK, Grantham Research Institute on Climate Change and the Environment/London School of Economics, 2019



tool, it is possible to model what land managers might expect to receive in revenue from Carbon Increment Payments. In Figure 6.5, the graph shows how carbon payments might progress over a 35-year period. For the sake of illustration, crop gross margins (taken from the John Nix 2019 Pocketbook for Farm Management) are shown for a small selection of crops and assumed to remain steady. Therefore the graph does not include likely reforms to agricultural subsidies and trade tariffs after Brexit, which may suppress gross crop margins.

**Figure 6.5: Carbon increment payments vs crop gross margins**



We can see that forestry would still struggle to compete with crops in the short term, as new trees get established and the carbon price remains relatively low. However, this changes over time and trees become competitive around year 11 in this presentation of the data. This reflects the S-shaped growth curves of most forest stands. The low start would help to incentivise the use of ELM contracts to improve early revenues, supporting environmentally focused design of tree stands.

Some schemes also incur carbon debts in their first stages – i.e. preparation of the ground leads to net carbon sources, not sinks, as seen in the first five years of the sitka spruce timber plantation. This is more than compensated for by later sequestration. However, in the case of carbon increment payments, we suggest that management plans account for such emissions by adjusting the length of the management plan period. I.e. a 10-year rather than a 5-year plan, with annual payments spread out over the period.

### Funding a Carbon Increment Payments system (CIPs)

Currently, the Woodland Carbon Fund and Guarantee are paid for by the Treasury through general taxation, whereas projects assured under the Woodland Carbon Code are private sector contracts. However, applying the ‘polluter pays’ principle suggests that a wider system of carbon offsets would be fairer, alongside or part of the UK’s future carbon pricing mechanism. We propose the creation of a new mechanism, combining the

Woodland Carbon Code and the Woodland Carbon Fund and Guarantee. Under this system, carbon credits at a similar price to the UK's total traded carbon price would be bought by carbon emitters instead of paying the carbon price. Receipts from these credits would then pay directly for carbon increment payments.

In the short term, this should be a government-managed scheme. In the longer term, it would expand to create a private market for such credits. It could also expand far beyond woodland carbon payments and include the full range of Natural Capital solutions. A fully mature system would thereby allow a range of market solutions within the context of Natural Capital Strategies.

To create this system, the Woodland Carbon Fund would need to be opened more widely to allow any landowner above 5-10Ha to participate, including those with plans for less intensive silvicultural ambitions, such as agroforestry farmers. The scheme could be assured by the Woodland Carbon Code and audited by accredited third party auditors.

To make such a system practicable, management plans would need to be implemented and audited for delivery. Currently the Woodland Carbon Code is audited through two organisations, Organic Farmers and Growers and the Soil Association, both approved by the UK's National Accreditation Body, UKAS. A levy of 5-10% should therefore be charged on carbon payments to pay for accredited third-party auditors to review sites every three years as described above.

### **Recommendation: Carbon Increment Payments system**

To incentivise forestry as a carbon sequestration solution and to address forestry's traditional problem with cashflow, government should create a Carbon Increment Payments system, paying landowners annually for carbon sequestered in trees on their land in a given year.

The scheme should be funded through an official market for carbon offset credits, obliging polluters to purchase credits. Offset prices should reflect the shadow carbon price in line with the 'net zero emissions by 2050' target, but with a cap per hectare or at a given price to prevent CIPs from drowning out other ELMS payments.

### **Natural Capital Investment Trusts**

Because of the lengthy time horizons involved in forestry, woodland investment has long been the realm of the wealthy. However, it is also a good investment as it does not correlate closely with other financial cycles and is a useful hedge against inflation because it grows continually. This is supported by a system of tax reliefs which make sense in isolation, but are effectively a wealth transfer from the general population to asset owners. Therefore whilst they should not be repealed as this would impact forestry investment (as seen during a similar attempt in the 1970s), the system should be opened up.

It is already possible to invest in forestry funds, but entry barriers are

high. Investments in forest funds provided through FIM Services Ltd, the market leader in the UK, start at around £30,000, which is beyond most investors in the UK population. Risks are also higher in early-stage woodlands, meaning that there is more of an active investment market in mature woodlands, which is relatively unhelpful for the UK's woodland creation targets.

A similar challenge in the property sector led to the creation of Real Estate Investment Trusts, which provide exemption from corporation tax relief and capital gains tax to property companies in return for requirements to pay the majority of profits to shareholders. With the advent of ELMS contracts and a Carbon Increment Payments system cashflow for a variety of land management practices, natural capital investment would become more predictable and lower risk. In order to return more of the financial benefits of land-related tax reliefs to small investors and communities, as well as accessing a large amount of private capital for environmental land management, government should create a new form of investment vehicle: a Natural Capital Investment Trust (NCIT).

NCITs would be able to create aggregate portfolios of woodlands and other investments in the land use, land-use change, and forestry sector. They would benefit from a range of tax reliefs in the sector, as well as multiple subsidy regimes paying for public goods. NCITs would be able to manage large portfolios of smaller woodlands, helping to improve market access for small landowners and investing in regional infrastructure. They could partner with landowners to help with woodland management. One model could include limited liability partnerships with farmers, paying them an annual fee in return for eventual timber profits – combining patient capital with regular cashflow.

NCITs would not be limited to forestry, but could cover a range of land uses. They could receive payments from government for environmental land management, but also from private entities. For example, water companies might pay NCITs to improve waterways for better quality abstraction, and insurance companies might pay them for peatland restoration that lowers flood risks.

#### **NCITS should exist in two forms:**

- **Public NCITs.** These would operate in the same way as publicly listed companies, allowing a much wider section of the population to buy shares and invest in forestry and other environmental assets such as restored peatland.
- **Community NCITs.** These would allow communities to own local land for the purpose of forestry and other uses. To avoid abuse of the system, community NCITs would require local authority endorsement. A Community NCIT could use its beneficial tax status to maximise returns for community value, such as harvesting biomass feedstock for a local district-heating network, as well as creating broader value from tourism and improvements to quality

of life. Financial revenues could be paid to the community as dividends, council tax discounts or as funding for local projects. Such schemes have a good precedent in the form of community forests in places such as Marston Vale, where the forest acts as a broad channel for investing in quality-of-life and community projects.

# A New Approach in UK Woodland Policy

## Section summary

A new approach is needed in land-use policy, applying national targets at a local level, supporting investment in supply chains and creating long-term direction for afforestation.

Tree planting, woodland management and forestry in the UK have suffered over many decades from the dominance of agricultural policies that force forestry into second place. Had the UK been starting from a stronger base, as seen in other EU member states, this would be a less critical problem.

In order to reach the much higher levels of planting, reforms should be implemented to address long-term and fundamental challenges in how British land managers approach trees.

These reforms fall into three broad categories:

### 1. An integrated approach to land uses

Silviculture must stop being treated as a separate and secondary sector to agriculture and should instead be seen as part of a spectrum of land uses and a tool that can be used in agricultural systems. Land-use policy should reflect the interconnected, interdependent nature of landscapes. Strategic frameworks should be developed that incentivise investment in natural capital priorities, including ecological, hydrological, agronomic, social and economic needs.

### 2. Stimulating demand for living trees in the landscape

Market and non-market incentives should be developed that reward the multiple services of living trees in the landscape. Carbon increment payments (CIP), environmental land management (ELM) contracts, nature recovery networks and agroforestry should all be key tools for doing so and should be allowed to operate together. Additionality should be achieved through a strategic use of these approaches in concert. Government should create a nationally significant project in the Forest of Britain and the Public Forest Estate should be a leader in the delivery of 'tree services'.

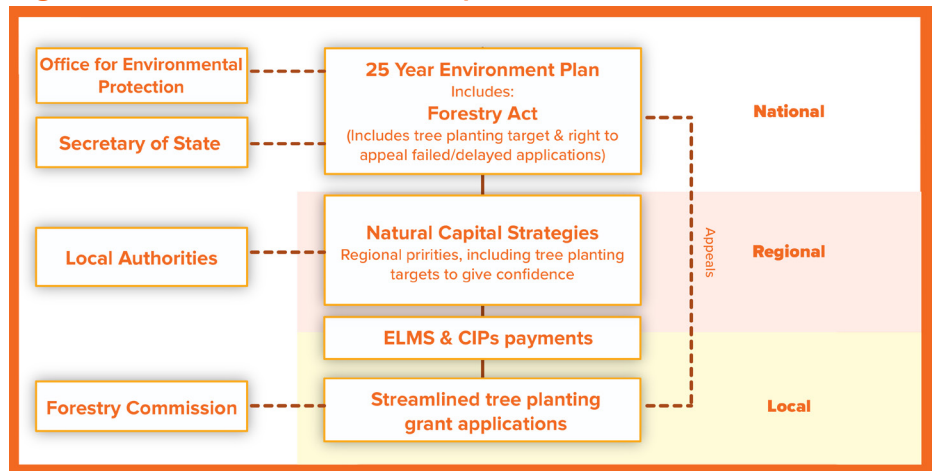
### 3. Stimulating demand for harvested tree products

Investment in forestry should be encouraged through a thriving

market for timber, wood and wood derivatives, as well as fruit, nuts, sap and other produce. Construction-timber markets should be the priority, with timber’s environmental benefits properly valued. Regional timber and wood supply chains should be encouraged through training funds, tax reliefs and loans for equipment and infrastructure. The Public Forest Estate should conduct a long-term withdrawal from the softwood timber sector as private supplies increase.

## An Integrated Approach to Land Use

Figure 7.1: A new framework to promote woodlands



We propose the creation of a land-use policy framework in which afforestation has a clear role. Fig 7.1 sets out the structure of such a framework, from a better and more flexible application system up to a national target under a new Forestry Act.

- **A new Forestry Act**

The current Environment Bill proposes an environmental policy statement be made by Government at the beginning of every Parliament. This should include forestry and tree planting commitments as standard. However, the very long-term nature of forestry policy means that a Forestry Act is needed to provide a legislative footing over multiple Parliaments.

The Forestry Act would perform two central functions. It would create an annual planting target based on sequestration estimates in line with reaching net zero emissions by 2050, as set out by the CCC. This would be part of the 25-Year Environment Plan framework, to be delivered by the Secretary of State and monitored by the Office of Environmental Protection.

The Act would also create a right of appeal for applicants who find their afforestation application either turned down or unreasonably delayed. Appeals would be made to the Secretary of State, who would make a decision based on the 25-Year Environment Plan and relevant Natural Capital Strategies. This

creates downwards political pressure in favour of afforestation, creating a mandate from legislation to the Secretary of State to the Forestry Commission.

- **Natural Capital Strategies**

Natural Capital Strategies take national targets and apply them at the regional level, based on the UK's major river basin districts. Developed by regional authorities, the Strategies would create priorities for natural capital investments, providing confidence to those wishing to make such investments. To protect private land rights, they would not prescribe spatial land use targets except in particular problem areas, such as flood zones. Strategies would be used to direct ELMS funding.

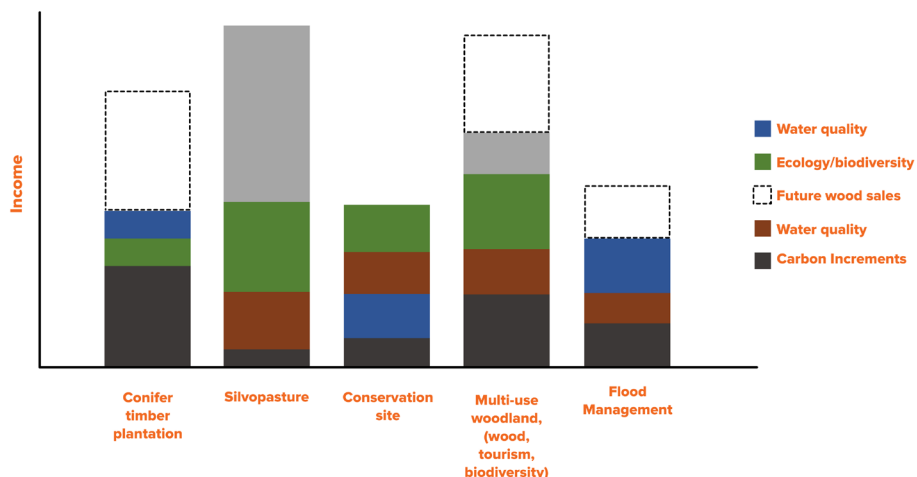
- **A streamlined grant application process**

Those applying for grants and ELM funding should not be unreasonably delayed or turned down. We therefore propose a streamlined application system with the following features:

1. **A direct reference to Natural Capital Strategies.** Applicants should be able to make applications with reference to regional strategies as a justification for afforestation.
2. **A well-defined but limited role for statutory and non-statutory stakeholders.** They should not be allowed to hijack or unnecessarily prolong an application process.
3. **A time limited process,** such as six months from application to decision, with an additional three months allowed if an Environmental Impact Assessment is required. This need should be identified as early as possible.
4. **No annual window for applications.** Applications should be allowed year-round.
5. **A right of appeal** to the Secretary of State if an application takes too long or is refused. Whilst this would likely be used only rarely, it would provide greater confidence to applicants.

## Stimulating Demand for Living Trees in the Landscape

Figure 7.2: Hypothetical revenue stacks for different models of multifunctional woodland



Applying the principles of ‘public money for public goods’ and ‘polluter pays’, we propose a system in which the services provided by trees in the landscape are able to offer cashflow, without excluding the potential to harvest them for tree products.

- **Carbon Increment Payments (CIPs)**

Alongside the ELMS system but with a separate revenue stream, the annual carbon sequestration of trees should be rewarded. Funded by a carbon offset market in which carbon emitters purchase credits, the system would pay landowners annually in line with a management plan. CIPs would form part of a flexible ‘revenue stack’, rewarding multipurpose woodlands more than single-function woodlands.

- **Encouraging agroforestry and farm woodlands**

Agroforestry, a broad term describing trees as part of an agricultural system, should be a central part of future British Agricultural Policy. We propose:

- Establish an **Agroforestry team** within DEFRA to develop an agroforestry strategy and integrate agroforestry into British farming;
- Create demonstration projects for agroforestry, with centres of excellence and collaboration with farmers’ unions to spread best practice and training;
- **A review of the UK’s nuts and fruit supply chains** should be conducted to identify opportunities arising from the plant-based food and drink sectors;
- Sense-check all new agricultural policies to **avoid any**



**unintentional policy barriers to trees on farms;**

- Create **Agroforestry-specific felling licences** that will reduce the perception among farmers that converting to forestry is a one-way path;
- Develop **ELM contracts specific to agroforestry**;
- Include low-density **agroforestry schemes within the CIP system** outlined above.

- **Forest of Britain**

A major government-backed project running the length of Britain would form a ‘green backbone’ for Nature Recovery Networks, connecting conservation sites along its route and maximising eco-tourism revenues. A multitude of land management practices would showcase the breadth and economic potential of ecologically sensitive woodlands.

## Stimulating Demand for Harvested Tree Products

**Creating immediate and long-term market signals to encourage investment in UK woodlands must be a phased process:**

- Actions now should focus on returning woodlands to management where possible, in order to build the investment case for woodlands and wood supply chains.
- Medium to long-term actions should ensure that new planting will have a reason to stay in management and will easily find a market when eventually harvested.

Immediate/short term	Medium/longer term
<p><b>Aim:</b> Bring more woodlands into management (especially hardwoods). Support new planting at scale.</p>	<p><b>Aim:</b> Support development of infrastructure and supply chains. Create market demand for UK-grown timber.</p>
<p><b>Actions/policies:</b></p> <ul style="list-style-type: none"> <li>• Funding for skills development, such as Rural Skills Transition Fund.</li> <li>• Provide confidence to woodfuel sector through clarity on wood heat support.</li> <li>• Support investment in woodlands through creation of NCITs.</li> <li>• New framework to create woodlands through Natural Capital Strategies, CIPs and ELMS.</li> <li>• Favourable treatment of agroforestry in agricultural policy.</li> </ul>	<p><b>Actions/policies:</b></p> <ul style="list-style-type: none"> <li>• Funding and tax reliefs for forestry/timber supply chain projects, including digital and physical infrastructure.</li> <li>• Target 40% of new housing to be timber frame by 2025.</li> <li>• Encourage UK-grown timber by applying carbon tax to ‘embodied carbon’ in buildings.</li> </ul>

## Appendix: Glossary

**Agroforestry:** The use of trees as part of an agricultural system. Includes the broad practices of silvopasture (trees with livestock) and silvoarable (trees with crops), as well as shelterbelts and other combinations.

**Agronomy:** The science and economics of food production from agriculture.

**Carbon sequestration:** The process of absorbing carbon from the atmosphere and storing it. In the case of trees, CO<sub>2</sub> is absorbed from the atmosphere via the process of photosynthesis, then processed into carbohydrates and stored in (mainly) wood. Dry timber is roughly 50% carbon by mass. This process is one of the planet's key regulators of atmospheric carbon and therefore its success is a determinant of climate change.

**Clearfell:** A harvesting technique involving the removal of all (or most) trees from a stand at once. Although not a visually attractive approach, clearfelling is a common practice in sustainable forestry, with a number of benefits. There are also more selective alternatives, in which a smaller number of trees from a stand are removed in a continuous cycle. Different practices have different advantages and depend on local conditions and reasons for harvesting.

**Closed canopy:** A form of woodland in which the upper canopy is mostly complete, making it difficult for light to reach plants and other organisms on the forest floor (see understorey).

**Hectare:** A metric unit of area, equivalent to 100m x 100m, or 10,000m<sup>2</sup>. There are one hundred hectares in a square kilometre. One hectare is equivalent to about 2.47 acres.

**Hydrology:** The study of the flow of water.

**Coppicing:** Cutting a tree down to its stool (stump) and allowing new shoots to spring from it, forming a new crop. The same tree can be reused in this way over many harvests. The wood produced is good for a wide number of uses, albeit not structural timber.

**Landbruk:** A Norwegian term for land use, with a cultural implication of

multiple land uses on one patch of land, similar to agroforestry.

**Overdue wood/timber:** Trees whose Mean Annual Increments have intersected with their Periodic Annual Increment have completed their optimal growth period and are considered mature. Stands with a large number of such trees tend to plateau in their growth (and therefore carbon sequestration), since mortality matches growth rates. Timber is therefore 'overdue' past this point – harvesting the trees will improve growth rates, economic returns and carbon sequestration.

**Pollarding:** Cutting back the branches of a tree above a certain height, but not the main trunk. Branches will regrow.

**Riparian buffer:** A section of trees designed to provide a buffer between a river and, for example, a crop field or a town. Such buffers are helpful for visual amenity, or to filter water and field run-off.

**Rotation:** The period of a trees or stand of trees from planting to maturity, usually defined by the Mean Annual Increment and Periodic Annual Increment.

**Shelterbelt:** A row of trees and shrubs along the side of a field, intended to shelter livestock and crops or soil from the wind.

**Short Rotation Coppice:** The use of fast-growing species such as willow for coppicing (see 'coppicing' above). Rotations tend to be around three years. Willow is also well suited in flood zones, making SRC a helpful crop for such areas.

**Short Rotation Forestry:** The use of fast-growing tree species such as aspen or eucalyptus to grow wood, often for the heat, pulp and paper markets. Rotations tend to be 10-20 years.

**Silviculture:** The art and science of the practice of woodland and tree management.

**Stand (of trees):** An area of trees managed as one. There is no definition for the size of a stand – they can vary from an acre to several hectares.

**Thinning:** In plantations, trees are usually planted closely together to encourage them to grow directly upwards, which improves the chance of good quality timber. However, this leads to intense competition for nutrients and light. Foresters therefore remove a number of smaller or misshapen trees every few years, to reduce pressure on the remaining trees. This allows the remaining trees to maximise their growth, creating better timber and improving carbon sequestration.

**Timber and wood:** Although often used interchangeably, timber and wood have traditionally been considered (and taxed) as distinct raw materials. Timber refers to those parts of a tree, particularly the trunk, that can be used for structural building. Wood means smaller parts that can be used for a range of other uses. In the Middle Ages, timber was tax-exempt because it took generations to grow, whereas wood was more easily available on an annual basis from coppicing and similar practices, and so subject to tax. The distinction can be seen in our everyday language: we refer to ‘wood fuel’, for example, but never ‘timber fuel’.

**Understorey:** The level of a woodland beneath the canopy but above the forest floor, i.e. smaller trees, shrubs and bushes.

**Windthrow:** When trees are uplifted, knocked down, snapped or otherwise killed by strong winds. Windthrow is a particular problem in places where forests have been inappropriately planted and established insufficiently stable root systems, such as drained peat. Windthrow in such occasions can lead to a dramatic domino effect, uprooting hundreds of trees.

**Woodmanship:** The management of woodlands through a range of methods, including coppicing, pollarding and shredding.





£10.00  
ISBN: 978-1-913459-03-1

Policy Exchange  
8 - 10 Great George Street  
Westminster  
London SW1P 3AE

[www.policyexchange.org.uk](http://www.policyexchange.org.uk)