WOODLAND NATION

Pathways to a forested Scotland owned by the people

Anna Lawrence and
Willie McGhee

A Footpath in Autumn at the Rosehall Forest Trails, Sutherland

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Report prepared for Andy Wightman MSP by

Forest Policy Group FPG

The authors thank ten colleagues in the Forest Policy Group, who commented on an earlier draft of this report. The Forest Policy Group is an independent forum dedicated to more sustainable forestry in Scotland. www.forestpolicygroup.org.

FOREWORD

"People and trees were colonists together: we have a long association."

People and Woods in Scotland: A History, Chris Smout

If Scotland were a normal European country, every Scottish city, town and village would own a substantial area of woodland. Far more of our land would be given over to trees. Small woodlands, community and municipal forests would be the norm rather than vast plantations owned by absentee investors.

Alongside the Scottish Greens, I commissioned this report from the Forest Policy Group to explore how Scotland can break with its past and find a new approach to its forests, inspired by continental Europe, but aiming at a distinctive Scottish approach to creating a Woodland Nation. At the heart of this report is a challenging target: for Scotland to have 40% of its land area dedicated to trees, woodland and forest.

Such a target is not solely about restoring the health of our environment, although it has lessons for those seeking to restore more natural environments. This report is not just about forestry, although it looks at the structure of Scottish forestry and the financial environment that supports it. And it is not about reinforcing binaries or encouraging further polarised debates. It is not about a sanitised and depopulated wilderness. It is not about commercial plantations owned by monolithic organisations.

Instead, this report is about introducing the idea of Scotland as a Woodland Nation.

How much land should we set aside for trees? Which land, where? What would it mean for more people in Scotland to be more involved in owning and managing woodlands? What extra resources and infrastructure would need to be in place for that to happen? And how can we become a woodland nation at the speed and scale required to help combat climate change?

The UK is one of the least densely forested countries in Europe. For thousands of years, human intervention led to deforestation. At its lowest point, perhaps 4% of Scottish land was forest. Efforts during the 20th century brought us up to the present-day coverage of 19%. However, woodland – like all land in Scotland – is owned by a relatively small number of organisations and people. Estates are far larger than is usual across the rest of Europe. Owners of land have far greater freedoms than across much of Europe. These facts are intrinsically linked: we must consider all of them in order to move forwards to a future forested Scotland.

Scotland has an opportunity to remake itself as a Woodland Nation where trees cover a far greater proportion of the land AND where people are directly involved in, and benefit from, the management and ownership of those trees. Where forestry is recognised as a pivotal player in the Scottish economy. And where our connection with trees is finally restored.

It is time to create a Woodland Nation.

Andy Wightman

Remnants of the Allean Forest Clachan Community

THE VISION

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'Woodland Nation' is a vision of a Scotland where forests cover more than twice their current extent, much of which is natural woodland; where the land and the forests are part of our society and economy, supporting prosperous rural communities and the wider economy through fairer ownership and attention to the environmental, economic and social benefits; and where trees are fulfilling their potential to help Scotland avert climate disaster.

This paper examines these ideas and considers how to make them happen. It was commissioned to start a new policy conversation about that vision, and how to make the transition.

The Woodland Nation vision would see 40% of Scotland designated as woodland, of which 60% should be native woodland [1].

[1] See section below for discussion of definitions

This ecological transition should be part of the wider Just Transition [2]. The reforesting of Scotland must be part of a process that leads to more equitable ownership of land, and fairer distribution of the environmental, economic and social benefits of reforestation. In this report we also examine the links between forest cover, ownership, power and benefits.

Scotland has made a remarkable transition from 5% to 19% forest cover in the last century. Before the current century closes, it may not be unrealistic for 40% of our country to be wooded. There is plenty of land where that can happen – land that cannot fulfil its potential under current land use and ownership.

In this future forested Scotland, industrial forestry has its place – the vision includes a 50% increase in area of well-managed industrial forestry which can provide for Scotland's material needs while accommodating other interests, such as the need for biodiverse habitats. More than half of the future forests would be more natural types of woodland, providing essential habitats and supporting biodiversity, but also contributing firewood, biomass, non-timber products, hardwood timber and locking up long-term carbon. This is where the significant expansion is needed: creating landscapes of natural wooded ecosystems.

Forestry in Scotland today is often caught in a polarised debate. There are those who want industrial forestry to be as profitable and efficient as possible.

There are also those who want native woodland to be as genetically local as possible. Both of these extremes are open to interpretation, and while there is a place for them, it's important to also explore less binary interpretations. These include timber-producing forestry which is ecologically and socially kinder than much of the current version, alongside native woodlands which provide commercial opportunities, embrace ecological change and allow humans to make a living. Examples exist in Scotland – but they are not mainstream, and often overlooked in policy making.

Photo by Ma Ti on Unsplash

[2] The concept of a Just Transition away from a fossil fuel-based economy to renewable energy is well established. It refers to the need for change to be just and equitable, redressing past harms and creating new relationships of power for the future through reparations. The same principle applies here to the large-scale shift in land use and management that is needed to transition to a zero-carbon economy.

Plantation above Strath Fleet, Sutherland
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Forestry and land use in Scotland are hot topics [3]. Views are expressed strongly and loudly. But with a lot more forest, including both natural woodlands as well as woods that can support livelihoods, there is no need to argue from polarised positions. This is a wonderful ambition. In making this happen, there are biophysical, social and political challenges. In Section 2 we outline the benefits of a reforested Scotland. In Section 3 we consider the forests and ways to increase their area. In Section 4 we look at the forest owners and ways to make ownership open to many more people. In Section 5 we consider the ways in which decisions are made, and how those could evolve to include many more people. Rather than fixing on strict definitions, progress will be made if we aim for these broad categories and then consider how to get there. In considering 'how', we can think about structure, laws, regulations, and ownership; as well about processes – who is involved in the decisions and what incentives are available. Ownership reform is sorely needed, but new woodlands can appear in the meantime.

Such a transition also sits in a web of wider policy, societal and economic issues. Land use decisions are affected by perceptions of risk and confidence, and these in turn by wider policy issues. Business and land and taxation systems, and deer management, all affect decisions and the risks borne in doing so. The language of 'bioeconomy' is widely used elsewhere, and forests are central to that vision; but they only bring the benefits of social and environmental justice when they are managed to support local values, needs and businesses.

Land, its uses and owners, is a dynamic topic in Scotland just now. As we were preparing this report, new papers, reports, newspaper articles and briefings were coming out from Confor, Scottish Environment Link, Woodland Trust, community groups, politicians, and scientists [4]. We intend that this report will add positively to the debate that swirls around where Scotland's trees should go and how they should be owned and managed.

[3] Headlines in national papers in 2019 and 2020 included: 'Super-rich buying up Scotland's forests' Times 1 Aug 2019; 'We need to bridge the timber gap', Scotsman, 6 Oct 2020

[4] Including for example: 'Woodlands for climate and nature' https://community.rspb.org.uk/ourwork/b/martinharper/posts/; Confor responds to RSPB report' https://www.confor.org.uk/news/latest-news/confor-responds-to-rspb-report/; Tackling climate change with the right trees in the right place' https://www.scotlink.org/tackling-climate-change-with-the-right-trees-in-the-right-place/;
Matthews, K. B., et al. "Not seeing the carbon for the trees? Why area-based targets for establishing new woodlands can limit or underplay their climate change mitigation benefits." Land use policy 97 (2020).

Kilpatrick Hills
Photo by Craig Bradford on Unsplash

Knapdale Forest
Photo by JR Harris on Unsplash

DEFINITIONS

Native woodland, natural woodland, commercial woodland, productive woodland, industrial forestry… what does it all mean?

In fact very few of these terms are clearly defined. It may be helpful not to define them because definitions can put things in boxes. This report argues that we need to get out of those boxes. Nevertheless, it is helpful to think about the different kinds of forests in Scotland, and how they are represented in words and numbers.

Official statistics about Scotland's forests are provided by Forest Research. They report forests in terms of **conifer** and **broadleaf**. Of course, many forests have at least a bit of each. Even those 'blanket spruce forests' of the uplands often have fringes of willow and birch. Many broadleaf woodlands contain conifers. Many traditional estates have mixed forests. But these are not reported in statistics, and so the data we provide below must use these two categories.

The conifer and broadleaf divide overlaps with another divide, between native and exotic (introduced) trees. And with another: native woodland and productive forest.

The assumption is often made that productive forest equates to non-native conifer, while native woodland equates to native broadleaves such as oak or birch. But there are productive forests of native Scots Pine, and of Silver Birch, and there are some unproductive conifer plantations. The Native Woodland Survey of Scotland defines 'native woodland' as 'woods comprising at least 50% of native species in the canopy, whether planted or semi-natural in appearance' (Patterson et al. 2014) which leaves room for interpretation. Clearly it's important to understand the context in which these different terms are being used.

The word 'productive' itself is used selectively. It is often understood to refer to forests from which timber is harvested. However this usage risks overlooking the spectrum of products and benefits, both private and public, that forests can provide.

The term 'industrial forestry' is applied to plantations of exotic conifers – predominantly Sitka spruce – which have small, discrete proportions of broadleaves and tend to be unmanaged throughout the life of the forest.

Another semantic minefield refers to 'rewilding'. The term has caught the public imagination and has much value. Some advocates of more natural ecosystems in Scotland prefer the terminology of 'ecological restoration', and for others it is simply a question of 'natural regeneration'.

The phrase 'natural woodlands' is a usefully open-ended term. While native woodlands are woodlands composed of more than 50% native trees, the idea of natural woodlands may allow a focus on processes, including natural regeneration and adaptation of species composition to changing conditions.

A further question relates to when something is recorded as woodland, and how well we are tracking woodland establishment and change. Between the National Forest Inventory, the Native Woodland Survey of Scotland and periodic woodland surveys by Forest Research, most, but not all woodland is being picked up and recorded. A regenerating woodland, as defined by Scottish Forestry, can be much more sparsely 'stocked' (400 stems per hectare) than a planted woodland. In some cases it may have arisen outwith any state scheme, and therefore go unnoticed and unrecorded. Likewise, woodlands planted by enthusiastic landowners without any state assistance may also go unrecorded. Scottish Forestry estimate there may be a couple of thousand hectares of such woodland, mostly in the Highlands. This is counterbalanced by the many woodlands that are recorded as part of woodland grant schemes but have in fact failed; those that appear on Ordinance Survey (OS) maps but which are no longer woodlands or never existed; and restocking sites that have never been restocked.

We don't attempt to untangle this web of definitions. Instead, we draw attention to the ambiguities, and aim to use the terms in a flexible way, focusing instead on the merits of functioning ecosystems.

Photo by Ma Ti on Unsplash

Pinewood regeneration inside protected area
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THE BENEFITS

Timber stacks in Galloway Forest Park
David Parker, CC BY 3.0 via Wikimedia Commons

It seems indisputable that trees are good. The UK National Ecosystem Assessment (Watson et al. 2011) summarises the evidence about goods and services that we rely on from trees and woodlands. Much research since then has documented the benefits for human health and wellbeing, creating a thriving economy as well as functioning ecosystems. But there is a difference between ecosystem services, their translation into benefits, and the value that different people give to those benefits.

The issue is not whether trees are good, but what kind of trees, and where; and who experiences them as benefits or disbenefits. The value of Scotland's trees is widely recognised, but much of the financial benefit is concentrated. On topics such as climate change and biodiversity, different interpretations of science – and different values – are driving opinion further apart.

Some of these value debates can seem to be polarised, with a widening split between 'native woodlands as habitats for wildlife' and productive forests (Knight 2019). Both the industry and the environmental non-governmental sector have explored intermediate options, but their approaches are still seized upon by the other 'side' as evidence of partiality. Other approaches also promote a split between forestry and other land uses: for example, in a report contrasting sheep farming with conifer afforestation at Eskdalemuir (Bell 2015). The media (including social media) may exacerbate this. In reality, many people are more open to diverse points of view (Fischer and Marshall 2010). Furthermore, there is a broad consensus that trees and woods are good, but not which trees and woods. The oft-repeated phrase 'The right trees in the right place' must be treated with caution. There is no single interpretation of 'right'.

Carbon: the contribution of trees and future tree planting is highlighted in climate change literature, particularly the Committee on Climate Change's Land Use: Policies for a Net Zero UK (Committee on Climate Change 2020), which recognises Scotland's greater capacity to contribute to this. Some radically different stances are taken on the evidence, notably between conservation organisations (Crane 2019, Harper 2020) and the forest industry (CONFOR 2020).

Jobs and the economy: a 2015 report on the economic value of the sector showed that Scottish forestry is worth £954 million GVA (gross value added) of which about 80% is attributed to forestry and timber processing, and the other 20% to forest recreation and tourism. Employment is around 25,000 FTE, with a similar 80:20 split between industry and recreation (CJC Consulting 2015).

Lack of statistics and research means that economic studies tend to overlook the small and local forest businesses. Work by the Forest Policy Group reviewed information available, and demonstrated that the management of small woodlands, businesses and communities can contribute to the environment, the social fabric and local economy (Lawrence et al. 2017, Worrell et al. 2018). They estimated that 6,255 people were involved in small scale, local forestry, whose income and local spend amounted to £69.8 million per annum in Scotland (Watt and McGhee 2018).

Thus, local small scale businesses amount to a quarter of mainstream business. These micro forestry enterprises in rural areas are important to the local economies in Aberdeenshire, Argyll & Bute, Dumfries & Galloway, Highland, Perth & Kinross and the Scottish Borders, and of particular importance in fragile or remote rural areas.

Different woodland types and forest management systems have different implications for the local economy.

Association of Scottish Hardwood Sawmillers: Key points from their response to the Scottish Government consultation on the draft Scotland's Forestry Strategy (2018) [extract]

1. We would like to see far more emphasis given to productive broadleaves and premium conifers (often called "minor species") - such an approach to forestry will deliver far more rural employment, reduced carbon emissions, and environmental and social benefits than the more uniform industrial approach implied by an emphasis on maximising fibre production.

Hopetoun Sawmill
cc-by-sa/2.0 - © Richard Webb - geograph.org.uk/p/58420

2. We hope to see small sawmills in almost every town and village in Scotland, producing sawn timber for local needs and more distant markets. These sawmills would provide a base for other local businesses in construction, furniture making, or other small-scale manufacturing industries, as is starting to happen in the Borders, Fife and Inverness.

The output and employment benefits from new native woodlands and farm woodlands are greater than those generated by planting additional coniferous woodlands of equivalent size (Eiser and Roberts 2002). Small local sawmills, firewood businesses and non-timber products are mostly based on mixed or broadleaved woodland (Worrell et al. 2018). Support for native woodland, mixed woodland and continuous cover forests can go hand in hand with support for a thriving local economy.

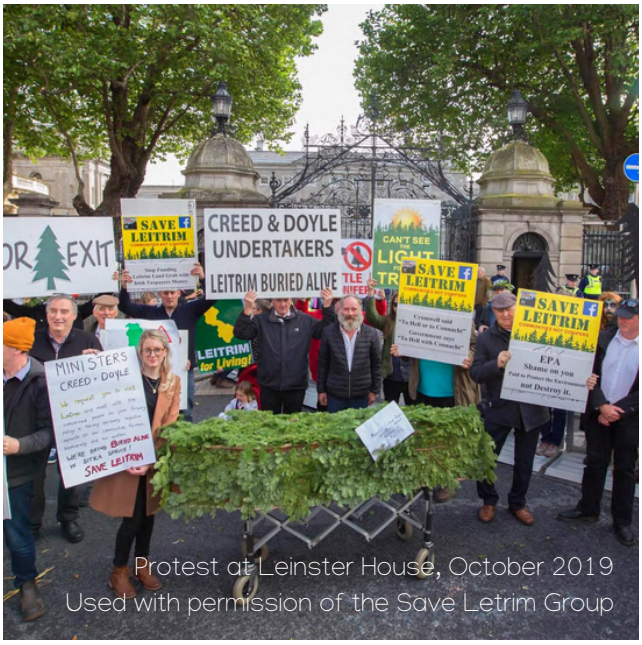
Money: income and capital growth is a significant benefit for some. Ownership of land and access to capital (and therefore government grants for planting) are highly skewed (see Section 4 below).

This means that the surge in conifer afforestation over the last five years has resulted in very high returns to what the Times called the "super-rich" (Linklater and Rosie 2019). Over the 10 years to 2017 UK forestry generated an annualised return of 15.7% [5]. This figure is bench marked by forestry investment companies against other forms of investments, to demonstrate that forestry is a profitable sector for investing.

Furthermore, more than 50% of the 40,187 hectares of new woodland created in Scotland between 2015-2020 consists of planted areas greater than 100 hectares. The most wealthy are best placed to benefit. This afforestation is subsidised by the public purse, through planting grants and by a raft of tax exemptions (including income tax, capital gains tax and inheritance tax).

Because this results mainly in incentivisation of industrial conifers, the public benefits - and particularly local social benefits - are reduced. The beneficiaries usually do not live in the landscapes that are impacted by the conifer afforestation, while those who do live in these landscapes feel under siege from the loss of familiar landscapes and livelihoods.

This situation is triggering pushback by communities, for example the 'Communities for Diverse Forestry' in Galloway [6]. Scotland is not alone in this reaction: County Leitrim in Ireland is developing a vocal opposition to industrial coniferisation. Communities tend not to be opposed to woodland creation in general, rather to the type of single-age, single species monoculture that dominates upland planting (Lawrence and Tabor 2020).



Protest at Leinster House, October 2019
Used with permission of the Save Letrim Group

Biodiversity value of conifer plantations: stakeholders have very different interpretations of the contribution made by conifer plantations to Scotland's biodiversity, and appear to make use of different science. A recent report by Confor which concludes 'Forests planted in the UK for wood production have significant biodiversity value' drew criticism from the Continuous Cover Forestry Group (CCFG), Scottish Environment LINK and the British Ecological Society who wanted to see more innovative thinking around silvicultural systems and commercial species preferences (Jones and Ovenden 2020, Rummens 2020).

Land-based culture: an active debate around sporting interests focuses on how best to stimulate a new paradigm of land management and land use. This has prompted development of evidence on the benefits of restoring large areas of native woodland in Scotland's uplands. Such benefits include increasing social, environmental and economic capital (Armstrong 2015), articulated by campaigning groups such as Revive [7] who argue that an increase in native woodland cover would reap ecosystem service benefits within 15 to 20 years resulting in 'self-sustaining, and sustainable, local communities with vibrant, land-based cultures'.

[5] UK Forestry Investment Fundamentals, Gresham House 2018.

[6] https://www.facebook.com/groups/581843619140972/permalink/643858426272824/

[7] https://revive.scot/

THE FORESTS


Photo by Dan Smedley on Unsplash

Where we've come from

Woodland began to spread across Scotland after the end of the last Ice Age, about 11,000 years ago. Its greatest extent was about 5,000 years ago (Smout et al. 2007); some say up to half the land was woodland, others are sure it was much more. In any case, the first people arrived and spread out at more or less the same time as the first trees.

We have colonised the land together, and our histories have been intertwined ever since (Smout 2003). The decline of forest cover over the last 5,000 years results from the interweaving effects of humans clearing woods for agriculture, the ease of timber imports by sea, the availability of cheap coal and the cooling climate, which favoured the growth of peat bogs and made it more difficult for the forests to regenerate. By the end of World War I, only 4% of Scotland was covered in forest.

Decades of debate about state intervention resulted in the establishment of the Forestry Commission in 1919, with the primary purpose of creating a strategic timber reserve for the UK after near-disaster during WW1 due to over-dependence on timber imports. It did this by acquiring land which it planted directly, and by creating incentives for private landowners to plant forest. The emphasis, based on the quality of the land available (better land always being reserved for agriculture) and the experience of the 'planting lairds' of the 18th and 19th centuries, was on fast growing exotic conifers to provide timber for markets and help sustain the rural economy. The policy changed after WWII to a more commercial approach to forestry by Government, requiring a return on investment in forestry with an increasing emphasis on timber production.

Industrial afforestation fell away from the mid-1990s through to 2016, after the excesses of afforestation in the Flow Country became headline news in the 70s and 80s and native woodland proponents gained purchase with politicians and the Forestry Commission in the 1990s. Native woodland planting – native conifers and broadleaves – fleetingly overtook industrial planting until 2016, when the forest industry got organised and successfully lobbied the Scottish Government for a return to an emphasis on exotic conifer forestry to support downstream industries, albeit with forestry plantations that are slightly modified versions of the late 20th century – including a small percentage of native broadleaves and open space.

However, in recent years planting trees to mitigate deleterious climate impact has been broadly supported by scientific advice and now underpins the Scottish Government's support for increased afforestation. Both extremes of the woodland / forestry lobby (native woodland versus conifers) use the climate change imperative to justify their position.

Conifer plantation above Loch Garry
cc-by-sa/2.0 - © Tom Pennington -
geograph.org.uk/p/915105

Where we are

As of 2019, 19% of Scotland was recorded as forest. [8]

Three-quarters of that is conifer, and of the conifer 58% consists of one North American species, Sitka spruce. In the public sector the figures are more skewed towards Sitka spruce: 92% of all public forest is conifer, and of that 61% is Sitka spruce.

[8] Note that this is not actual forest cover, as it includes open spaces within forests, and clearfell areas awaiting restock.

Figure 1: stocked woodland area (thousand ha) in Scotland by ownership and principal species: Conifers

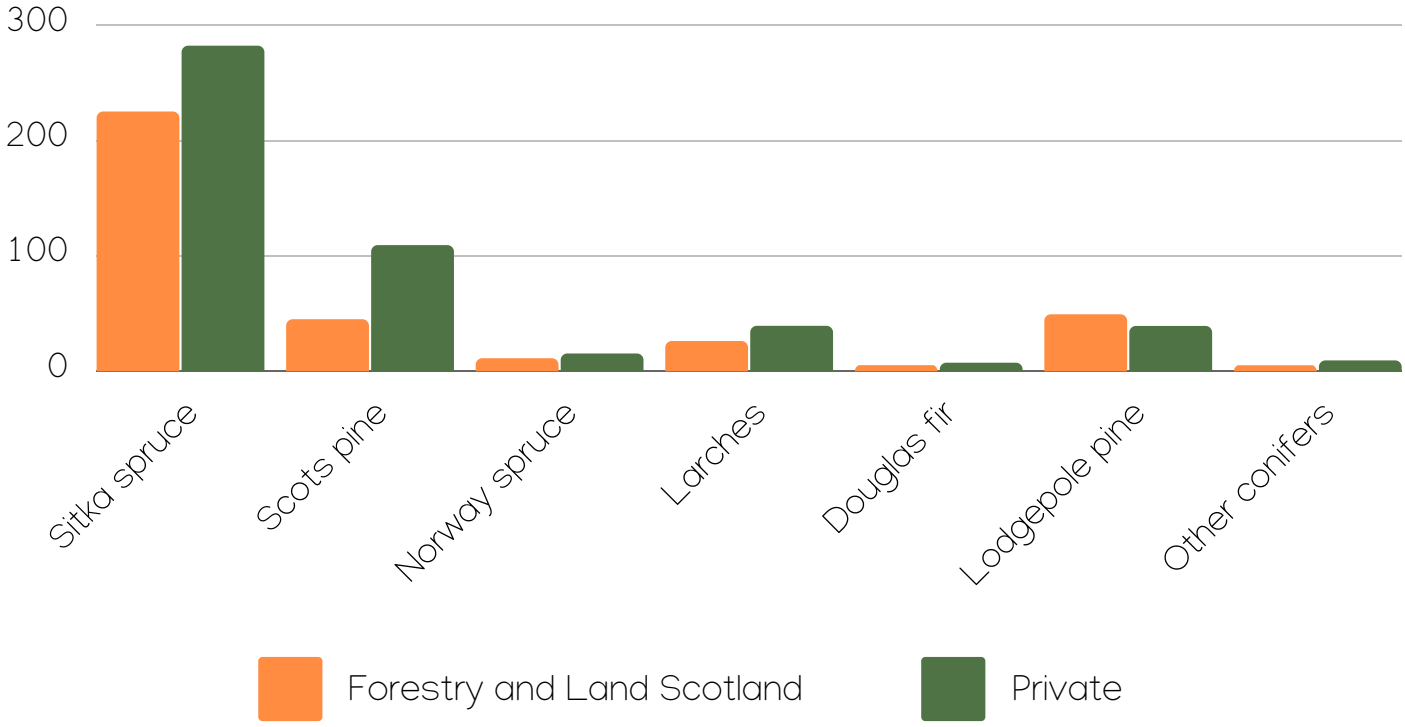
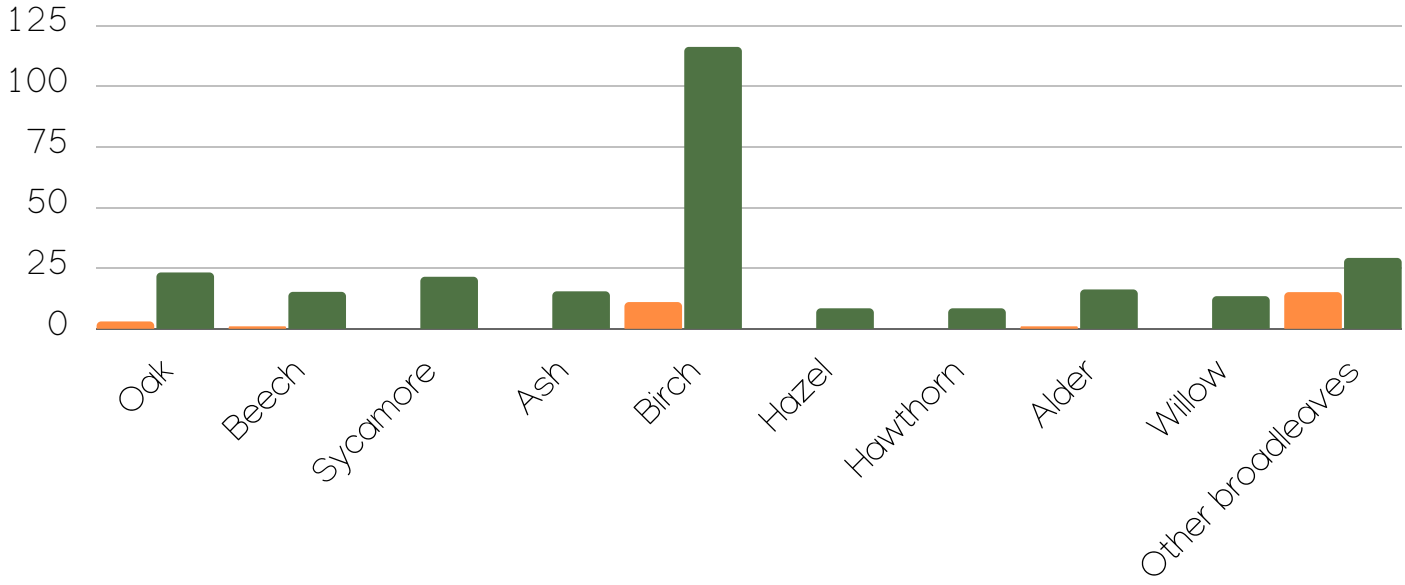


Figure 2: Principal broadleaf species in Scotland by area (thousand ha)



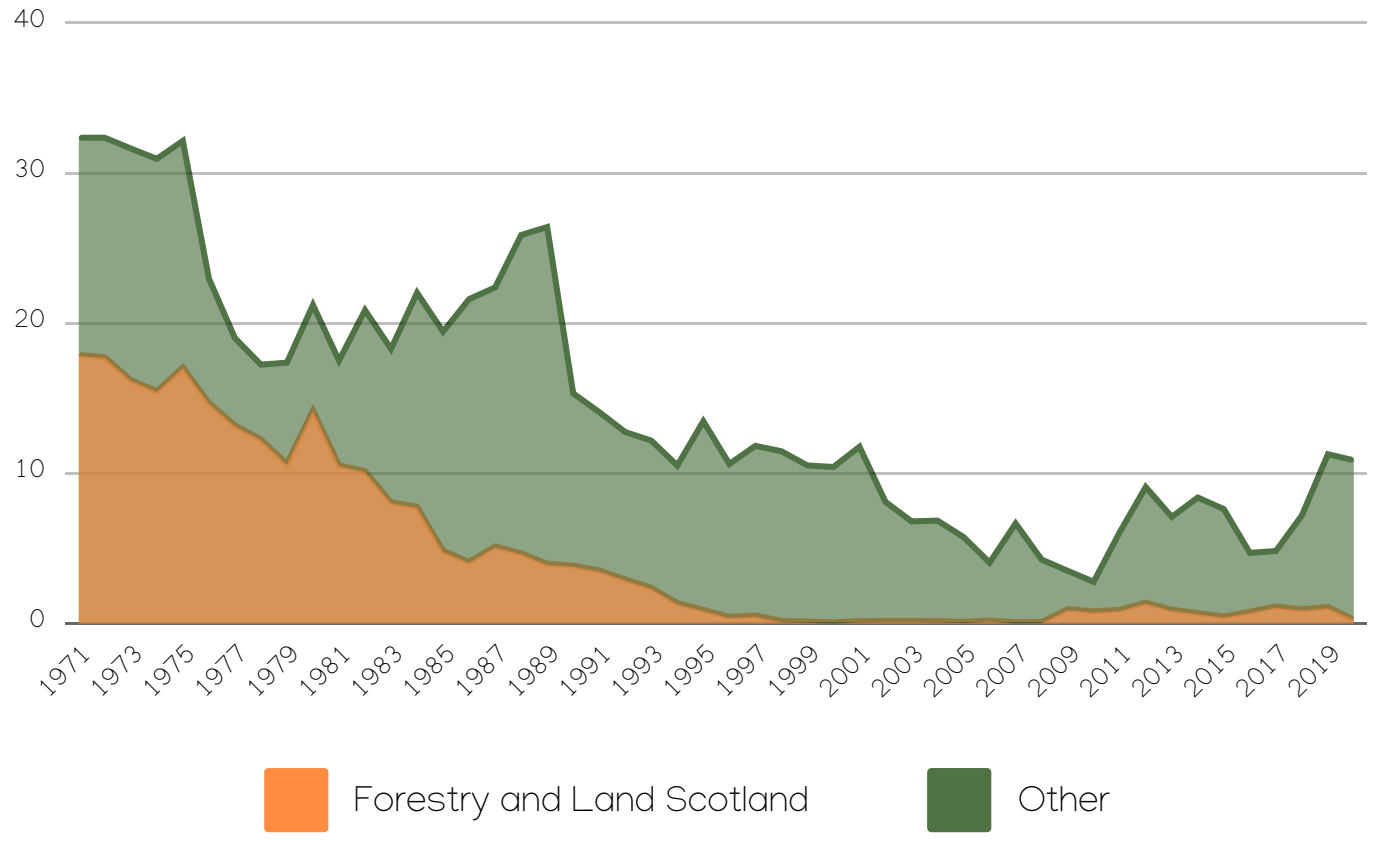
Data source: latest published statistics (2020) on species composition in Scotland, based on the National Forest Inventory (NFI). Note that the label 'private' refers to 'all other owners' i.e. non-FLS, which in fact includes some public owners include MoD, SNH, local authorities.

These proportions are not static. Figure 3 shows that, from 1982 onwards, the private sector has out-planted the public sector. Figure 4 relates to the private sector, and shows how a focus on conifers has been replaced by a more variable balance of new conifer and broadleaf planting. The growth of broadleaf planting – not all of it with native tree species – from the early 1990s outstripped conifer planting year-on-year from 2001 through to 2016. The relationship between farming and forestry incentives is crucial to land becoming available for planting/establishing more woodland.

The drop off in new planting after 1989 was, in part, because of changes to agricultural incentives, such as the introduction of the Single Farm Payment. Adjustments to the planting grants in 2015 shifted the balance once again towards industrial conifer planting.

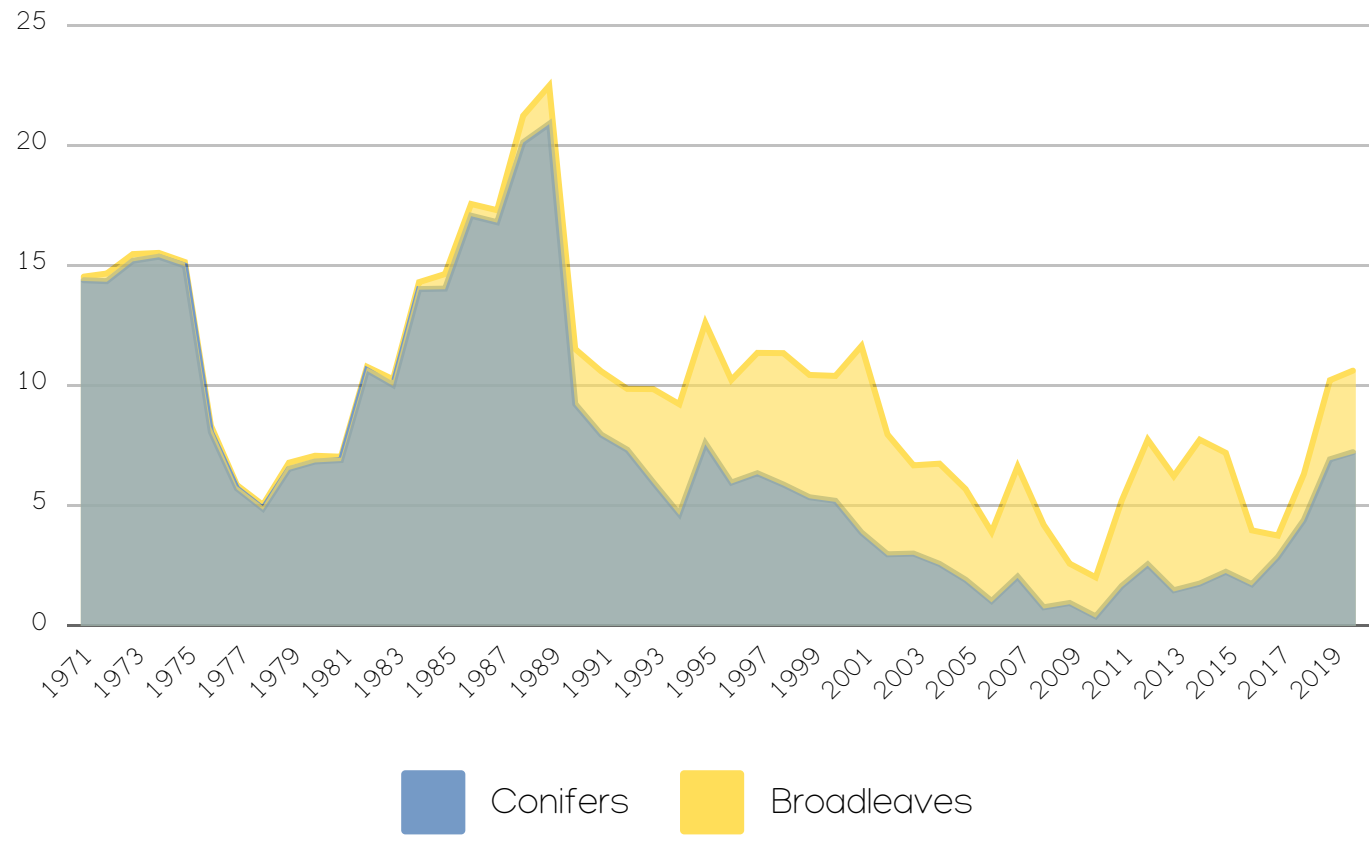
From 2015 to 2020 new planting has reached 40,000 hectares and Scotland's woodland cover has increased from 18.4% to 18.7% (2016-2019).

Figure 3: New forest planting (thousand ha) per year, Scotland: public and private sectors compared



Data source: longer time series data from https://www.forestresearch.gov.uk/tools-and-resources/statistics/statistics-by-topic/woodland-statistics/

Figure 4: New forest planting (thousand ha) per year, Scotland, on private land: conifer and broadleaf compared



Data source: longer time series data from https://www.forestresearch.gov.uk/tools-and-resources/statistics/statistics-by-topic/woodland-statistics/

Native woodland and ecological restoration: native woodland planting in Scotland became mainstream in the 1980s and early 1990s, supported by the work of organisations such as Reforesting Scotland and the Millennium Forest for Scotland Trust. At a regional level, Trees for Life works to restore Caledonian pinewood in Glen Affric and wider Highland region, and the Borders Forest Trust has established more than 1,000 ha of native woodland in southern Scotland. These and other projects (e.g. RSPB at Abernethy and National Trust for Scotland at Mar Lodge) provided inspiration for many and acted as models and precursors of the current vogue for rewilding and landscape scale restoration.

The public sector played a key role in providing guidance and incentives for native woodland and natural regeneration from 1988 onwards. Examples of public forests involved in restoration and research include Glen Affric, Dalavich (Loch Awe), Glengarry and recently Loch Katrine (with partners).

A significant strand in Scotland's reforesting story is that of ecological restoration. Part of this story overlaps with the woodland expansion statistics presented in Figures 3 and 4, but much of it is not captured by statistics. So we rely on the experiences of NGOs, private owners, and public agencies to provide pointers towards successful, affordable natural woodland creation.

Since 2000, private individuals have played a high profile role in large scale native woodland restoration, most prominently the efforts of Danish businessman Anders Povlsen and his wife Ann, who bought Glen Feshie and a number of other Scottish estates – totalling 95,833 ha – and who are transforming Highland landscapes by drastically reducing Red deer numbers.

Dynamics of woodland regeneration are central to the objectives of ecological restoration, and to the wider purposes of this policy discussion paper. Without natural regeneration, forest expansion at the scale proposed will depend on planting, which is expensive – and in turn depends on seedling production and seed availability, both serious constraints. Native woodland planting also often results in landscapes of plastic tubes. Tree regeneration, however, depends on low densities of deer, requiring sustained attempts to address out-of-control herbivory (by deer) and conflicts between land uses and landowners. Such attempts are repeatedly advocated but rarely implemented (Tanentzap et al. 2013).

Forest regeneration, Carrifran - © Jim Barton - geograph.org.uk/p/2531060

The Native Woodland Survey of Scotland (NWSS) [9] sounds an alarm about the current status of our native woodlands (Patterson et al. 2014). Within its broad description (see Box 1) the survey found an area of just over 311,000 ha, or 22.5% of the total forest area of Scotland in 2011. Of this, less than half was found to be in satisfactory condition for biodiversity.

Deforestation: finally, an overview of Scotland's changing woodland cover must include deforestation as well as afforestation. There are several significant contributions to deforestation in Scotland. The picture is complicated by the fact that the statistics do not differentiate between removal for 'habitat restoration' (for example, through removal of Sitka spruce crops which have been planted in inappropriate places) and the less desirable loss of veteran trees and ancient woodlands. Other ways in which forest cover is reduced include increase in open space for landscape or biodiversity, when forest plans are revised, and forest removal, when new wind farms are created. Despite the requirement for windfarm developers to carry out compensatory planting elsewhere there is a lack of evidence that this is actually happening [10]. Internal FCS evidence indicated that some 10,000 ha of deforestation due to windfarms took place in the period up to 2010.

In public forests there is often a 3-7 year time-lag between felling and restock. This is because the public sector is trying to reduce the use of chemicals to control Hylobius weevils' outbreaks by leaving the sites fallow. Equally, it may be viewed as an attempt to reduce costs.

But strangely, the saddest deforestation is unlikely to be classified as deforestation, because it involves the slow loss of ancient native woodland remnants as trees senesce and regeneration fails. This slow loss of Scottish woodland and old trees is a result of many factors, including sheep grazing, grass fires, muirburn and high deer populations. The Native Woodland Survey (Patterson et al. 2014) compared its results to Ancient Woodland inventory and aerial photos, and reported a loss of around 14% of ancient woodland to other land uses over 40 years, nearly all in unenclosed uplands.

Where could the new forests go?

Land for new woodland cover: Scotland's woodland cover in 2020 was 1.47 million hectares [11] or 18.8% of the land area. To achieve woodland landcover of 40% will require afforesting an additional 1.7 million hectares of which 1.5 million would be native woodland.

[9] The NWSS took 7 years, with field surveyors visiting 848,000 hectares of woodlands of which over 40% were surveyed in detail. Qualifying woodlands consisted of a discrete area of at least 0.5 hectares (ha) with a tree and/or shrub canopy and a minimum width of 20 metres (m), and which is at least 20 m long.

[10] Scottish Forestry do not collect this data, because it falls within a Planning remit. Forest and Land Scotland, formerly Forest Enterprise Scotland, has felled some 14 million trees between 2000 and 2020 (for windfarms, micro-hydro schemes and peatland restoration).

[11] https://www.forestresearch.gov.uk/tools-and-resources/statistics/data-downloads/

What does this mean for the 40% target?

To achieve the vision of 40% forest cover, Scotland's woodland area needs to more than double. To move from 22.5% to 60% native woodland, of a more-than-doubled forest area, requires an increase in native woodland cover by a factor of more than 5.

To move to 40% conifer, of 40% forest cover, requires an increase of about 40% on current areas.
Because these categories are not mutually exclusive (some conifer is native, and some native is productive) a simplified version of this goal is:

- Increase native woodland to 5 times its current area, and to consistently high quality
- Increase productive conifer forest to 1.5 times its current area and improve structural and species diversity.

Finding land for afforestation poses some questions about land use trade-offs. What agricultural land may be suitable or desirable to afforest? Is it appropriate to grow trees on priority habitats and organic soils? Where should we grow trees to achieve the greatest public benefit? These questions have been explored in earlier work addressing policy goals.

A discussion paper published in 2008 on Woodland Expansion in Scotland identified some 16% or 1.3 million hectares of Scotland as being potentially suitable for woodland, with a further 28% or 2.2 million hectares potentially suitable but with possible limitations. This Discussion Paper aimed to identify ways to deliver woodland expansion targets outlined in the 2006 Scottish Forest Strategy (i.e. increase woodland cover from 17% to 25% by 2050, requiring some 650,000 hectares of land).

In 2012 the Woodland Expansion Advisory Group (WEAG) reported to the Cabinet Secretary for Rural Affairs and Environment on several questions including "Is there land to meet new planting targets?" and "Where is it?" (WEAG 2012).

The answer was yes: a potential 2.69 million hectares, or 34% of Scotland, was suitable for tree planting, more than enough land to accommodate an increase in woodland cover to 40%.

Although they used different land classifications, data and land type terminology, the 2008 and 2012 studies provide broadly similar estimates of availability and location of land for afforestation in Scotland. The key message from both studies is that land per se is not limiting for tree planting; rather, land for afforestation is hedged around with limitations and constraints, some statutory, most not, and many rooted in cultural or attitudinal perceptions of land use.

A presumption against large scale afforestation on the best arable land is clear in the 2008 and 2012 woodland expansion studies, as well as a presumption against creating new woodlands on deep peat and designated sites such as base rich meadows.

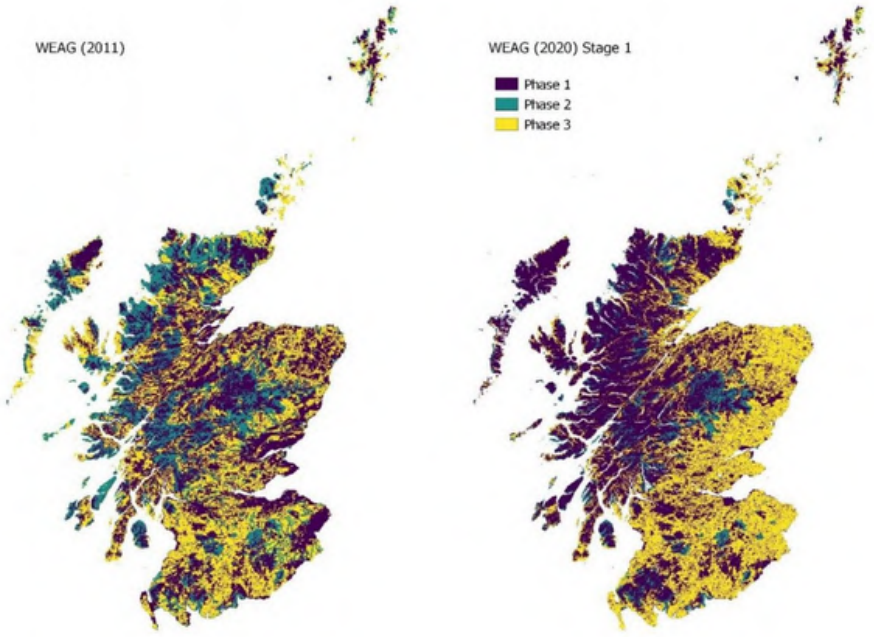
Tree planting on the best arable land was considered for small farm woodland, hedgerow trees, riparian woodlands, community woodlands or orchards.

Grazing land, much of it located in the uplands and upland margins, is dedicated to producing sheep and cattle, and it is this land that offers the greatest potential for afforestation. This is in part because such land rarely carries local or national designations and, aside from some opposition from the agricultural sector, relatively few limitations and constraints. It is also heavily dependent on Government grant support, which at present is uncertain, and exposed to the vagaries of market forces.

The quest for identifying and mapping new land for afforestation in Scotland took a different turn in 2020 when Forest Research published maps of Scotland that showed where land should not be available to forestry on the basis of soil organic status (Matthews et al. 2020). This provided the basis for a ClimateXChange paper exploring how land availability has changed within Scotland since the 2012 WEAG study, factoring in peaty soils, soil and climate change (Sing and Aikenhead 2020). It concluded:

- Land considered suitable for woodland creation has increased by an estimated 270,000 hectares to 2.96 million hectares.
- This change is due to a reassessment in peat classification and extent (-263,352 ha) and the inclusion of potential planting on higher quality agricultural land (+533,352 ha).

Figure 5: WEAG land availability maps from the 2011 and 2020 analyses



The WEAG 2011 map and a revised 2020 map (Figure 6 below) show the differences that parametrising for organic soils can make to the parts of Scotland deemed as suitable for afforestation.

This work to identify land suitability for afforestation, factoring in organic soil of greater than 50cm depth, does not take account of the role of natural regeneration of woodland on organic soils, and may not accurately reflect the heterogeneity or granularity of Scotland's local soils. For the purposes of this report we have opted to use the 2012 WEAG data.

Using the WEAG 2012 Scotland data, grazing land and upland heath offer the greatest potential for woodland expansion in Scotland, albeit with sensitivities on both types of land arising from climate change impacts, agricultural, shooting and conservation interests.

Where in Scotland is the available land? The mapped areas of potential land for afforestation in the original WEAG (2012) study are marked in green in Figure 6. Much of this land lies in the uplands and upland fringes such as the Southern Uplands, the Lammermuir Hills, Moorfoot Hills, Lowther Hills, the Angus Glens, the fringes of the Cairngorms and the north and western Highlands, as well as parts of central and Highland Perthshire, Ayrshire and Argyll. A significant proportion of potential land consists of grazing land and grassland in Ayrshire (South and East), Aberdeenshire, Fife, Perth and Kinross, Dumfries and Galloway and land lying immediately north and south of the Central Belt.

Figure 6: Land areas "most likely to have potential for woodland expansion" (green) in 2012. Source: (WEAG 2012)

Constraints to land availability: Identifying land with biological potential for forestry in Scotland is relatively straightforward. Converting this potential land to forest expansion, however, continues to present a suite of challenges.

Factors militating against woodland expansion identified in the 2008 study were:

- High land prices
- Uncertainty over agricultural support, but with the Single Farm Payment actively discouraging land from becoming available for woodland establishment.
- Changes to grant regimes
- Complexities of land ownership and tenure, and
- Cultural barriers to forestry

These barriers to creating new forests are likely to continue. Furthermore, plans for woodland creation are often reduced by pragmatic realities on the ground. Closer examination of the proposed planting area, surveys of land suitability, and responses from statutory consultees such as NatureScot, RSPB and the Local Authorities usually reduce the area available for planting, to protect archaeology, wildlife, habitats, organic soils, etc.

An additional constraint, specific to native woodland restoration, is the relatively high cost of planting native trees. This contrasts with using natural regeneration as a mechanism for tree establishment.

Much of the cost of planting native woodlands is in protecting newly planted trees from grazing (by sheep) and browsing (by deer), protection which requires deer fencing and tree tubes. Costs for establishing all types of woodlands with 'soft' [12] conifer species and broadleaves, native or other, would significantly decrease with a more robust and cohesive approach to deer management than is currently the case, and by significantly reducing Red and Roe deer numbers above the Central Belt, and Roe and Sika deer numbers in the Lowlands. Deer are the major impediment to establishing new woodlands by natural regeneration in Scotland. A significant reduction in Red deer numbers, going well beyond the numbers laid out by The Deer Working Group Report (February 2020) (Pepper et al. 2020), would allow tree regeneration to establish [13], albeit over a much longer time frame than direct tree planting, and could prove a low cost, high impact mechanism for native woodland expansion.

[12] Soft is used to describe all conifers except Sitka spruce, which is significantly less palatable to herbivores than other conifers

[13] Evidence from several sites indicates that a stocking density of 1-3 deer per square kilometre will result in tree regeneration (if there is a local seed source), as opposed to the recommended 10 per square kilometre in the DWGR

Another constraint to achieving more planted woodland in Scotland is the availability of tree seedlings, especially native tree seedlings. Most tree nurseries are large scale, relatively centralised enterprises, and are geared up to producing many millions of conifers for the forest industry. In the past, the nursery industry has either suffered from sudden changes in the grant regime or a lack of take up in tree planting, sometimes acting as a bottleneck due to lack of stock, at other times having to destroy large numbers of seedlings which have not been sold. Large nurseries are capable of growing native tree seedlings however a network of localised small-scale native tree nurseries would provide local employment and economy and could, potentially, be more resilient to disease.

Forestry does not exist in isolation from other land uses, notably agriculture. Historically forestry has had to settle for the least productive agricultural land, in part because of high land prices. Land prices are high because of a number of factors, including the Westminster controlled tax regime and Scottish Government and EU fiscal support for agricultural through direct payment schemes. Although future support for agriculture is uncertain, afforestation in 2020 (through the Scottish Forestry, Forestry Grant Scheme) remains predominantly focused on less good, more marginal agricultural land.

The largest expanses of poorest quality land in Scotland, least valuable in agriculture terms, are in the uplands.

Conversely the most desirable land for shooting, deer stalking, and grouse shooting is on the poorest quality land in the uplands, which is also the land where much habitat and species conservation interest lies.

A reduction in livestock numbers and grazing in the uplands, especially on heath, in response to changing agricultural subsidies or a downward trend in livestock prices, could result in widespread tree regeneration. This happened, albeit patchily, in the north west of Scotland with the introduction of the Single Farm Payment Scheme in 2003. Farmers and crofters were able to claim subsidy payments and to reduce or remove sheep stock from the hills.

Muirburn is a hindrance to tree regeneration on Scotland's upland heaths. Carried out annually to 'improve' heather condition and structure for the benefit of red grouse, muirburn effectively kills most regenerating tree seedlings (Armstrong 2019).

Results of muirburn outside Ballater
cc-by-sa/2.0 - © Nigel Corby -
geograph.org.uk/p/855167

Were muir burning to cease or reduce, and grazing to be removed, trees could naturally colonise large expanses of heather moorland, providing a more acceptable mechanism for afforestation to nature conservation interests than blanket coniferization. Natural regeneration need not be a threat to shooting interests; being patchy, random and resulting in a mosaic of vegetation types, it could be managed in conjunction with rough shooting, albeit not the more industrial driven grouse shooting.

Areas of Scotland that may be slow to regenerate include grass dominated semi improved and unimproved swards and areas of bracken. Examples of these are the 'white' [14] hills which are commonplace in the Southern Uplands. These are often dominated by a relatively impenetrable grassy sward that without some form of disturbance (usually cultivation); and the lack of a nearby seed source means that young trees need to be planted if a rapid forest cover is required. Alternatively, a rewilding approach, and/or reintroduction of low intensity cattle grazing, can achieve a more gradual, carbon efficient and natural afforestation.

How long might it take to achieve 40% woodland cover? It took 100 years, from 1921 to 2020, for Scotland to get to 19% woodland cover. Afforestation rates in Scotland have declined from the peak of industrial planting in the 1980's (when more than a quarter of a million hectares were planted in ten years) to a more modest 77,000 hectares planted in the ten years between 2011 and 2020.

In the last 5 years, since the advent of the Forestry Grant Scheme in 2015, approximately 40,000 hectares of new woodland have been planted [15] (or approved for planting), with the planting rate increasing from an all-time tree planting low of 2,720 hectares in 2010, to 11,304 hectares in 2019. The Scottish Government has been committed to planting 15,000 hectares per annum by the year 2025 [16]. However this target changed in September 2020, with a revised target of 18,000 hectares per annum being adopted in 2020 through to 2030 [17].

Doubling the existing woodland cover to 40% of Scotland's land area would, at the current rates of planting, take another 100 years. Figure 7 gives an indication of what afforestation rates may need to look like to achieve 40% cover by 2120. The graph shows woodland creation broken down into ten year segments, and illustrates the proportions of native species and exotic conifers that would be needed to give a forest cover ratio of 60% native species and 40% conifer, if the composition of existing forests does not change.

[14] A white hill is grass dominated and has been managed by grazing and burning to get rid of the heath.

[15] FGS Statistics Summary - Clearing Round 52 (28/02/2020) Scotland Total

[16] https://www.confor.org.uk/news/latest-news/scottish-budget-includes-funding-rise-for-forestry/

[17] https://www.confor.org.uk/news/latest-news/snp-well-plant-36-million-trees-a-year-in-scotland-by-2030/

Figure 7: Average levels of woodland expansion since 1921 to present (thousand ha), and projection from present to 2110 to attain 40% woodland cover (60% native woodland). Adapted from WEAG Report 2012.

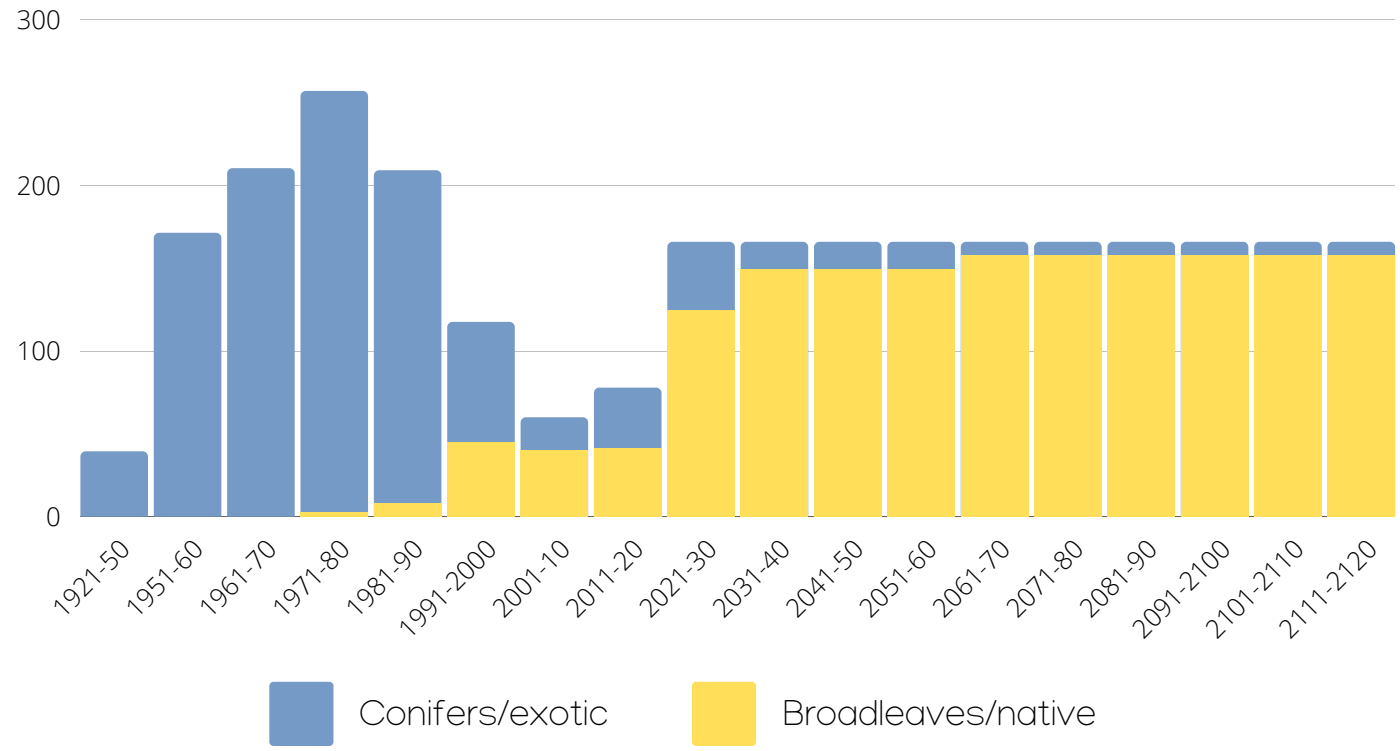
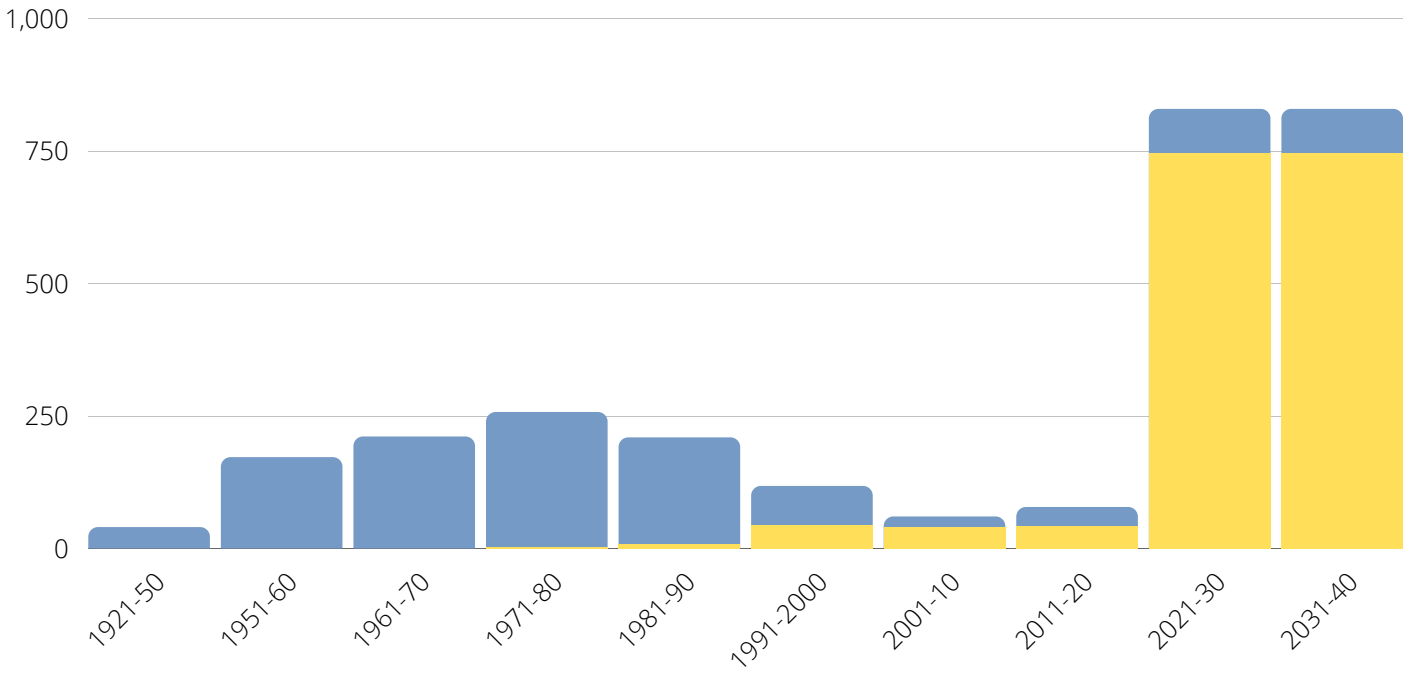


Figure 8: average levels of woodland expansion since 1921 to present (thousand ha), and projection from present to 2110 to attain 40% woodland cover (60% native woodland). Adapted from WEAG Report 2012.



An alternative scenario is shown in Figure 8, based on a target of 2040 to achieve 40% woodland cover. This scenario would require some 83,000 hectares of new woodland to be established every year for the next 20 years. Again the proportions of different woodland types are based on the assumption that the composition of existing forest does not change. Land use change at this rate is clearly not possible. The two dates provide an envelope for thinking about target rates for change, and what needs to happen to make that change possible.

How is afforestation planned at a regional level? A number of local authorities in Scotland have produced forest strategies, previously referred to as Indicative Forest Strategies, which guide where afforestation may or may not happen and what types of forestry are preferred. Preference depends on factors such as landscape, environmental sensitivities, water catchments and existing forest cover. Our case study of the Cairngorms provides a more detailed example.

In 2018 the **Cairngorms National Park Authority** published a Forest Strategy which set a short-term target of establishing 5,000 hectares of forest between 2019 and 2022. Existing tree cover within the Park is some 16.4%, or 62,300 hectares of the land area, lower than the Scottish national average of 19% with Scots pine woodland accounting for 60% of forest cover.

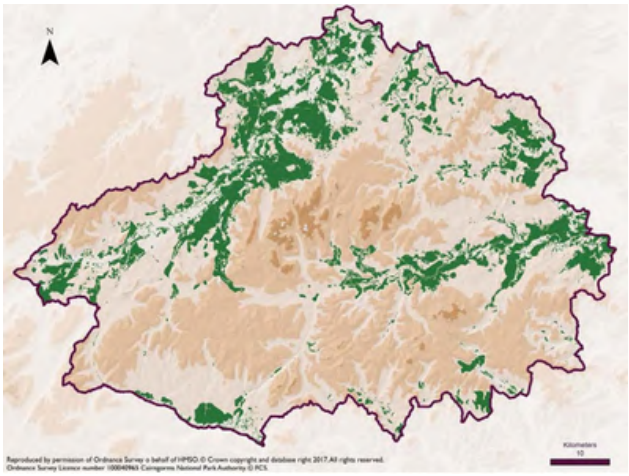


Figure 9: Current forest resource in the Cairngorms National Park (Cairngorms National Park Strategy, 2018)

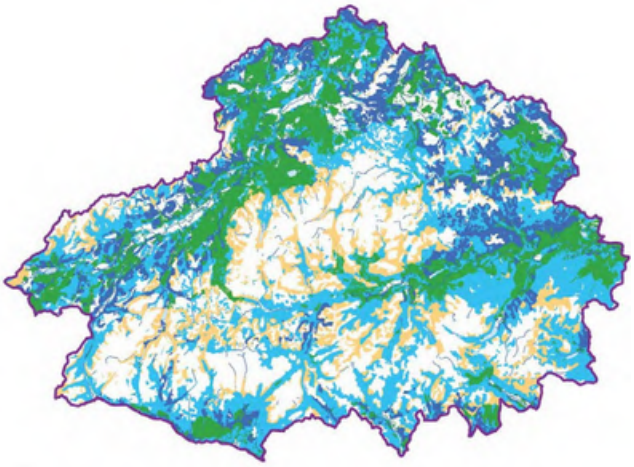


Figure 10: Preferred and potential areas for woodland creation in the Cairngorms National Park (Cairngorms National Park Strategy, 2018)

- Existing forests and woodland
- Preferred areas
- Potential areas with sensitivities
- Potential montane woodland

The CNP forest Strategy provides a framework for expanding forest cover; describing a modest afforestation target of 20% forest cover across the Cairngorms by 2045, this is an increase of 3.6% over 25 years requiring 1,000 hectares of new woodland per annum. The Strategy places an emphasis on expanding native woodland – Caledonian pinewood, native broadleaves and montane scrub - much of it by naturally regenerating Scots pine Caledonian pinewood.

Glen Feshie Estate in the Cairngorms is owned and managed by WildLand Limited, and is an exemplar of what can be achieved through natural regeneration of native woodland in a relatively short space of time. Since 2004 Red deer numbers have been dramatically reduced and natural regeneration of Scots Pine, Juniper and Silver Birch is developing and widespread across the estate.

Regenerating Scots pines at Glen Feshie
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How do we get new woods in new locations?

Woodland creation in Scotland has for the last 100 years been a product of state intervention, either by incentivising landowners to plant trees or by the state acquiring land to afforest. Today, new woodlands can be a product of a number of factors: government policy including grants and advice; private sector support through corporate social responsibility (CSR); and purchase of carbon credits which fund new planting. Hence markets interact with policy support.

Policy levers available to the Scottish Government to promote woodland expansion include legislation, grant incentivisation and advising and educating landowners.

Legislation banning the practice of muirburn and by licensing game shooting would be a powerful driver for native tree regeneration. Stopping muirburn on heather moorlands would facilitate colonisation by regenerating native trees such as rowan, birch and Scots pine – although it could typically take more than 20 years for woodlands to develop. Non-native trees such as Sitka spruce are also likely to be a component of naturally regenerating woodland.

Other ways in which **regulation** could act as a brake on excessive deer browsing include licensing of sport shooting linked to deer management targets.

The Deer Working Group Report (DWGR) recommended that Scottish Natural Heritage (now NatureScot) adopt a figure of 10 Red deer per square kilometre as an upper limit for acceptable deer densities (Pepper et al. 2020). The DWGR deer stocking density figure is far too high [18], is unlikely to result in tree regeneration and would likely result in the failure of native woodland planting in the absence of deer fencing [19]. Ecological restoration projects, such as at Glen Feshie, demonstrate that to successfully regenerate native woodland without fences the deer density figure per square kilometre should be between 1 and 3. The deer stocking density at Creag Meagaidh was below 5 deer per square kilometre before native tree seedlings appeared.

The 17,500 hectare **Glen Feshie Estate** in the Cairngorms held a population of 1,500 Red deer in 2004, a deer density of 8.6 deer per square kilometre. The Red deer numbers were reduced to 400, a Red deer density of 2.3 deer per square kilometre, and as a result natural regeneration of Caledonian forest is well advanced.

Incentivising woodland creation is something that governments have done, with varying degrees of success, over the last one hundred years. To achieve new native woodland at scale, future governments will need to incentivise native tree planting and natural regeneration, in conjunction with stronger deer legislation to reduce woodland establishment costs, and grant aid deer control to ensure that trees get established.

Natural regeneration in the uplands could materialise with significant reductions in the numbers of grazing and browsing animals. Reducing sheep numbers can be incentivised through targeted agri-environment measures, as was previously done through Environmentally Sensitive Area (ESA) schemes.

A mechanism to achieve meaningful reduction of deer numbers could be an increase to the Forestry Grant Scheme deer management grant, currently £6 per hectare per annum of woodland managed, such that a sufficient increase could cover deer stalking costs and thus provide an incentive for land managers to manage deer more actively.

The Scottish Forestry Grant system needs to be rebalanced away from the current overly generous subsidies for industrial conifers, towards enhanced grant rates for native conifer and native broadleaved woodland, some of which can be targeted at actively managed productive broadleaved and mixed woodland.

Carbon Credits, Natural Capital and Biodiversity Net Gains are relatively novel concepts which have gained traction with corporate entities and Governments as mechanisms for offsetting negative environmental impacts resulting from pollution and developments.

[18] The figure of 10 deer per square kilometre is actually higher than the 2020 deer density for Scotland which is 9.3 per square kilometre.

[19] http://www.blackgrouse.info/management/deerfencinggguidancenote11.pdf

Carbon credits at Over Ardoch
cc-by-sa/2.0 - © M J Richardson - geograph.org.uk/p/2053354

Credits generated from tree planting in the UK have been traded by landowners since the 1990s, mostly to corporate entities with CSR requirements. The UK Government created the Woodland Carbon Code [20] as a voluntary standard to provide independent verification and validation, and as of 30th June 2020 a modest 20,000 hectares of new woodland had been registered in the scheme, accounting for a potential of 7.7 million tonnes of CO2 sequestered. By supporting tree planting, they help to pay for the provision of ecosystem services, including mitigation of climate change impacts such as flood prevention.

Carbon credits from woodland creation have been the subject of heated debate within the environmental sector. Many argue that carbon credits make tree planting a licence to pollute, while others point out that commercial forestry does not guarantee long term carbon sequestration. Trees and forests do play a valuable role in sequestering carbon dioxide from the atmosphere and locking it away as carbon.

However, the longevity of the carbon benefit and the possible negative carbon balances generated by industrial forestry practices – such as draining, ploughing, clearfelling - are topics of debate amongst foresters and scientists (Vanguelova et al. 2018, Matthews et al. 2020).

At what scale the private sector is willing or able to invest in these activities and fund the creation of new woodland is unclear.

Examples in Scotland include BP's 1990s investment in the Scottish Forest Alliance of £10 million for native tree planting in exchange for carbon credits over 200 years, and Shell's donation of £5 million in 2019 for Forestry and Land Scotland to plant 1 million trees to offset 20% of Shell's UK forecourt fossil fuel sale emissions [21].

Market forces are a significant driver in industrial forestry. Market 'pull' results from favourable tax treatment, high timber and biomass demand and prices, and the value of forestry as an investment asset class, plus the marketing of forests to the wealthy at a global scale. Added to generous Government grants which amply cover the costs of establishment of an industrial plantation and can even recoup a portion of the capital to purchase 'bare land', industrial conifer plantations are a lucrative investment (Armstrong 2019, Pepper et al. 2020).

[20] https://woodlandcarboncode.org.uk/

[21] https://www.shell.co.uk/media/2019-media-releases/drivers-set-to-go-carbon-neutral-with-shell.html

THE OWNERS

Wooplaw Community Woodland (CC BY-SA 2.0) Tom Parnell

Land ownership affects land management, and how people share in the benefits of land. In Scotland it is far less normal to own a woodland than it is in almost any other European country. This reflects a wider pattern: that land is highly concentrated in the hands of remarkably few owners (Scottish Land Commission 2019).

When land comes to market the areas offered are often enormous, and valued at hundreds of thousands, or millions of pounds [22].

The result is that this pattern is not changing: few people have the opportunity to buy land, and few can access the benefits and influence that come with land.

These patterns need to change for ecological reasons, but also for social justice reasons.

[22] Examples on the market at time of writing include Polmood Forest, Scottish Borders: 153.5 ha, offers over £3.5 million; Kilry Forest, Angus: 203.2 ha, offers over £4 million; Allt Daraich, Argyll and Bute: 265.07 ha, offers over £3 million.

The signs are clear that people want to see more trees and woods in Scotland. Fairer ownership would allow the benefits to reach more people; more widely distributed ownership involves more people and their values in managing the land. Scotland is on a journey of land reform unique in western Europe, but progress is slow, and the legislation's focus on community ownership may be missing other ways for people to get closer to the land.

We explore these themes in this section.

The freedoms of land owners in Scotland

The rights of land owners to do exactly as they please with their property vary between countries. To the extent that a government can limit or require particular actions from owners, that government (or the public that they represent) is sharing in the property rights. These can be shifted through changing arrangements within the existing legal and cultural framework (e.g. through management agreements or leases); or by changing the legal and cultural conditions (e.g. new laws, regulations, values and expectations).

Compared with most landowners in Europe, Scottish landowners have a lot of freedom about how they use their land (Nichiforel et al. 2018). They have very few limits on what they can do, or what they can stop others from doing, on their land.

Even the strongest restrictions – intended to prevent deforestation – do not prevent gradual forest loss when the owner wants that. Furthermore, some regulation only applies if land managers want to get a grant, or plant or fell trees. There are no rules against passive management – owners don't have to clear up windblow or prevent over-grazing. Ongoing small scale fellings, failure or delay in restocking, and losses of woodland quality and regeneration to herbivory all contribute to deforestation.

Scale of ownership

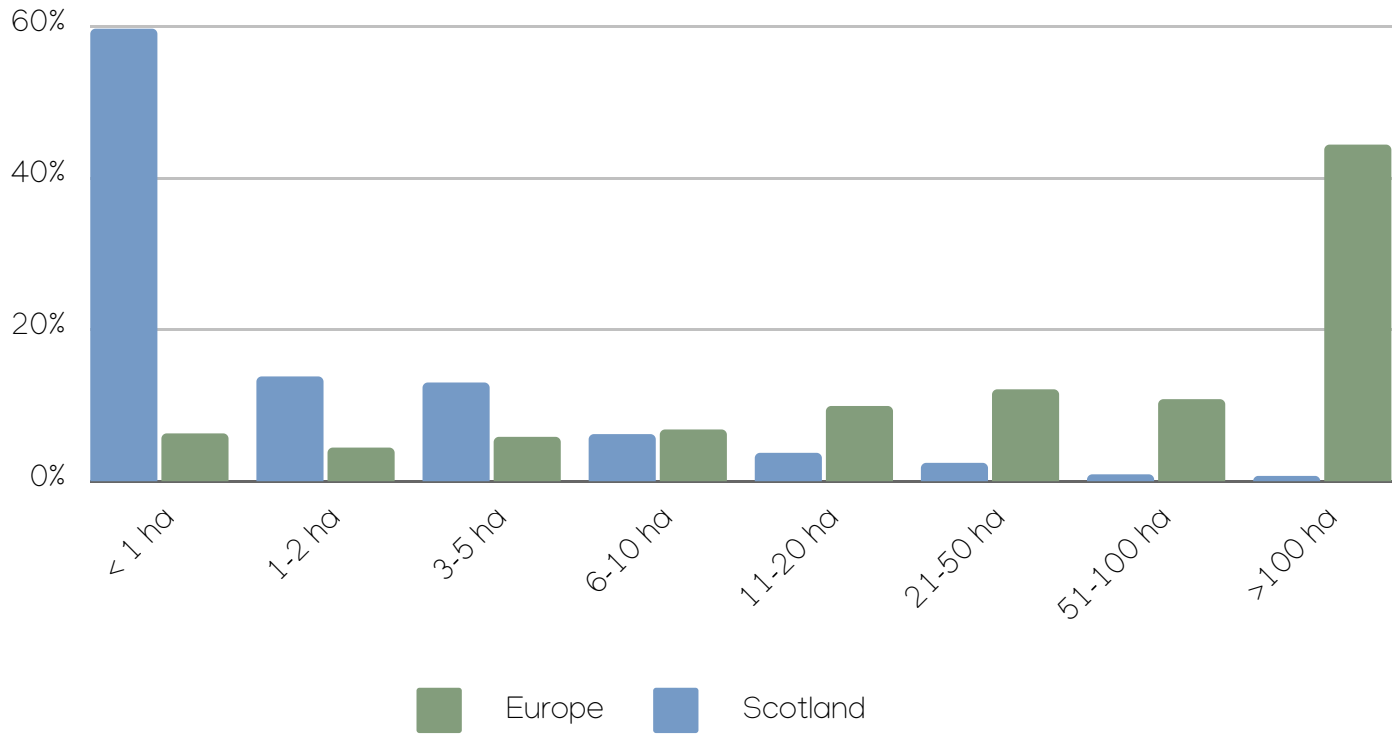
In Section 3 we compared the broad categories of public and private forest ownership, and afforestation rates on each type of land. These labels of 'public' and 'private' are reported in a peculiar way in the UK (see below, 'the data problem'), which means that we need more research-intensive approaches give a more accurate picture. If we are going to make woodland ownership accessible to 'ordinary people' we need better data, based on categories that make sense and provide an informative picture of patterns across the country and trends over time. Useful contributions to this include the Scottish Land Commission's work on concentrated land ownership , and FPG's 2012 study of forest ownership (Wightman 2012).

Wightman's detailed study shows that Scotland has the most concentrated pattern of private forest ownership in Europe (Wightman 2012). Indicators include:

- 55% of forest holdings in Scotland are over 50 ha (compared with 1.6% in Europe)
- 6.3% of forest holdings in Scotland are under 1 ha (compared with 55% in Europe)
- 55% of Scotland's private forest area is owned by absentee landowners and 32% live outside Scotland

A more recent UNECE report on forest ownership, based on data from 2015 and averages across 24 countries, shows a similar pattern: see UNECE/FAO, Who owns our forests? Forest ownership in the ECE region. ECE/TIM/SP/43. Geneva: United Nations Publications. 2020. p. 197.

Figure 11: size class distribution of private forest land holdings in Scotland and Europe, 2010, derived empirically (from Wightman 2012)



A Gurkha recruit from ITC Catterick moving across woodland plantation
Open Government Licence v3.0.

Rozelle Estate in Ayr
Run by South Ayrshire Council
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THE DATA PROBLEM

Scotland is poorly resourced in terms of land ownership data compared with most other countries in Europe, because of incomplete land registry data (UNECE/FAO 2020). Forest ownership is reported differently and is also problematic. UK forestry statistics include only two ownership categories: 'public' and 'private'. Even this is misleading, because the 'public' forest category refers only to Forestry and Land Scotland (FLS) land.

Other public bodies (such as SNH [now NatureScot], Scottish Water, and the Ministry of Defence), are included in the category labelled 'private'. The forestry statistics include no sub-categories of private owner types. There are also no sub-categories of public forest. Scotland's public forest is reported to consist only of national forest (UNECE/FAO 2020)

This means that reliable quantitative data to analyse forestry on land owned by communities, NGOs and agencies other than FLS is not available.

Local authority forestry is largely invisible, and thereby often undermined. It is also difficult to find out from the local authorities themselves how much woodland (or even land) each owns. Most local authorities can provide only an estimate or partial data on the land covered by trees and woodland (van der Jagt and Lawrence 2019).

Our most detailed understanding of the woodland owners in Scotland comes from a study conducted in 2012, based on detailed empirical (and therefore time-consuming) investigation. The study focused on two areas of Scotland and traced the ownership of every forest in that sample (Wightman 2012). This provided important insights which remain the most detailed picture of forest ownership in Scotland.

Other countries have excellent data about woodland owners and their preferences (e.g. Hujala et al. 2013, Eggers et al. 2014). Scotland lacks that data which would be so helpful in working with a wider woodland-owning public.

Types of ownership

Public ownership: Forestry and Land Scotland currently manages 32% of Scotland's forests on behalf of Scottish Ministers. This National Forest Estate is of central interest for delivery of sustainable forestry. Forest policy in most countries is founded on the delivery of multiple benefits. Scotland (and the wider UK) is almost unique within Europe, in that the public forests are all classified as available for wood harvest but they also deliver globally important biodiversity conservation (for example at Glen Affric), recreation, social services (such as accessible healthcare walks) and education.

However as noted above there are other public bodies that own forests and woodland which are not represented in Forestry Statistics. For example, the contribution of Scottish Natural Heritage to increasing areas of native woodland (providing public benefits and local employment) at Creag Meagaidh and Beinn Eighe is not visible in these data. The MoD owns 18,000 ha of forest across the UK, mostly planted specifically for military training [23].

Public forest ownership is popular. Policy proposals to lease 25% of state forests in Scotland to the private sector were opposed and dropped in 2008 [24]. Policy proposals to sell off the public forest estate in England in 2011 provoked uproar, were dropped and the minister responsible did not survive the next cabinet reshuffle. This attachment to public forests is not unique to the UK.

Similar outrage and political losses are described as 'political suicide' in Germany (Joensson 2011). However while there is public support for the principle of public forest ownership, some stakeholders query the value of FLS management in reality, complaining that it is inefficient, bureaucratic, unaccountable and fails to engage effectively with communities and small local businesses (Lawrence et al. 2014).

The public forest agency and the national forest estate should have a central role in a Woodland Nation. They can have a much more positive and creative role than they currently do. FLS has the potential to be more participatory and service-oriented, particularly if re-imagined as a National Forest Service, similar to developments of the US Forest Service, which has in recent years developed a more participatory ethos and adapted its structure accordingly. (Orth and Cheng 2019)

Local authority ownership: as a subset of public forests, local government land could also have a catalytic role in contributing to the Woodland Nation vision. Local authorities could be planting more woodland and facilitating a role for communities in woodland management. Local authority land is particularly significant in urban areas and represents potential to increase urban forestry.

[23] https://insidedio.blog.gov.uk/2018/09/24/root-and-branch-managing-the-mods-woodlands/

[24] https://www.archive.scottish.parliament.uk%2Fs3%2Fcommittees%2Frae%2Fpapers-09%2Frup09-05.pdf&usg=AOvVaw2vXC38rb_VRN2CPaVVfCmC

Greenspace Scotland reported in 2012 that semi-natural greenspace, including woodlands, provides about 22% of Scotland's urban greenspace. A study in 2015 suggested that up to 32% of Glasgow's urban space could be available to plant trees or shrubs and highlighted a lack of medium sized trees, to replace the current large trees (Rumble et al. 2015). In Glasgow, a woodland survey by the City Woodland Initiative estimated a resource of 1,600 ha, equivalent to 64% of all urban woodlands, in council ownership (van der Jagt and Lawrence 2014).

However, the current situation comes with some challenges. A recent Scottish Land Commission study on local authority land ownership suggests learning from experiences in other countries (Mc Morran et al. 2019). However, local government in Scotland is very different from local government in much of the rest of the world. Our local authorities are larger and more remote from community and place than the examples that we are encouraged to emulate. Communal or municipal forests in Germany or France, for example, have existed for centuries and communities often have a strong sense of attachment to them (Konrad and Szymon 2015, UNECE/FAO 2020). At the same time, forest management is usually delegated to professional foresters and as an ownership model it does not necessarily increase people's engagement with forests (Mattila et al. 2015).

The potential exists, but involving local authorities in delivering Woodland Nation would require a big shift in culture and resources.

Currently the capacity of local authorities for land management is decreasing, a result of shrinking budgets, falling staff numbers and increasingly risk-averse cultures. Scottish local authorities are often unaware of how much land they have, where it is and what condition it is in. A survey of street trees in Glasgow found that instead of the 6,000 trees previously listed, the total was about 71,000 (van der Jagt and Lawrence 2014). This situation is compounded by the view, common within local authorities, that land and trees are a liability, both in terms of risk and management costs (van der Jagt and Lawrence 2019).

Local authorities see the land under the trees as a huge potential development asset and can be reluctant to transfer it to communities. Two recent studies of community asset transfer and management point to cases where urban neighbourhoods have rallied round to prevent LAs from selling popular greenspace for housing, some failing in the attempt, others developing successful co-planning outcomes (Lawrence 2018, Mc Morran et al. 2018).

However, local authorities have contributed to new woodland creation e.g. Penmanshiel [25] in the Scottish Borders, and significant areas of woodland in Edinburgh through the Millennium Forest for Scotland.

[25] https://www.sruc.ac.uk/info/120104/forestry_and_estate_management/1704/penmanshiel_compensatory_replanting_grant_scheme_pcrgs

Small scale private ownership: a reforested Scotland with widespread forest ownership would include many small-scale forest owners. That is not the current situation and contrasts starkly with many other countries.

In continental Europe and the USA, reaching and influencing small-scale owners is a high priority. Internationally, there is a vast number of studies of small-scale non-industrial private owners because governments want to reach them to influence their forest management (e.g. Fischer et al. 2010, Ficko et al. 2018, Weiss et al. 2019a). In Scotland, such owners do not add up to a significant proportion of the whole and they are largely neglected. While some studies suggest that many small-scale woodland owners hold strong conservation views and have little or no interest in actively managing their woodland, others suggest a more complex and changing situation (Lawrence and Dandy 2014). Woodland owners' definitions of management are sometimes different from those of forestry professionals (Feliciano et al. 2017).

Irati Forest, Spain
Miguel Ángel García (CC BY 2.0)

In the absence of good research it is risky to generalise about small scale owners; they can include farmers who would like to manage their woods productively but don't have the capacity, and so-called 'hobby' owners who sometimes prefer not to intervene in their woodlands.

Community land ownership is better documented than other categories, because it is a policy goal (Scottish Government 2019). About 2.7% of Scotland's land area is now community owned, with a very large proportion of this is in the Highlands and Western Isles.

Only a small part of community land is forested and data on community owned forest is not collected.

The Community Woodlands Association estimates that between 20,000 and 30,000 hectares of woodland are community owned [26].

Scotland's model of community ownership is distinct from other countries, and does not rely on tradition or forms of local government. Usually the community forms a company limited by guarantee (CLG) or a Scottish Charitable Incorporated Organisation (SCIO), which is permitted in law to own property. Other models of joint ownership (untested so far in Scotland) include bencoms (community benefit societies), cooperatives and community shares.

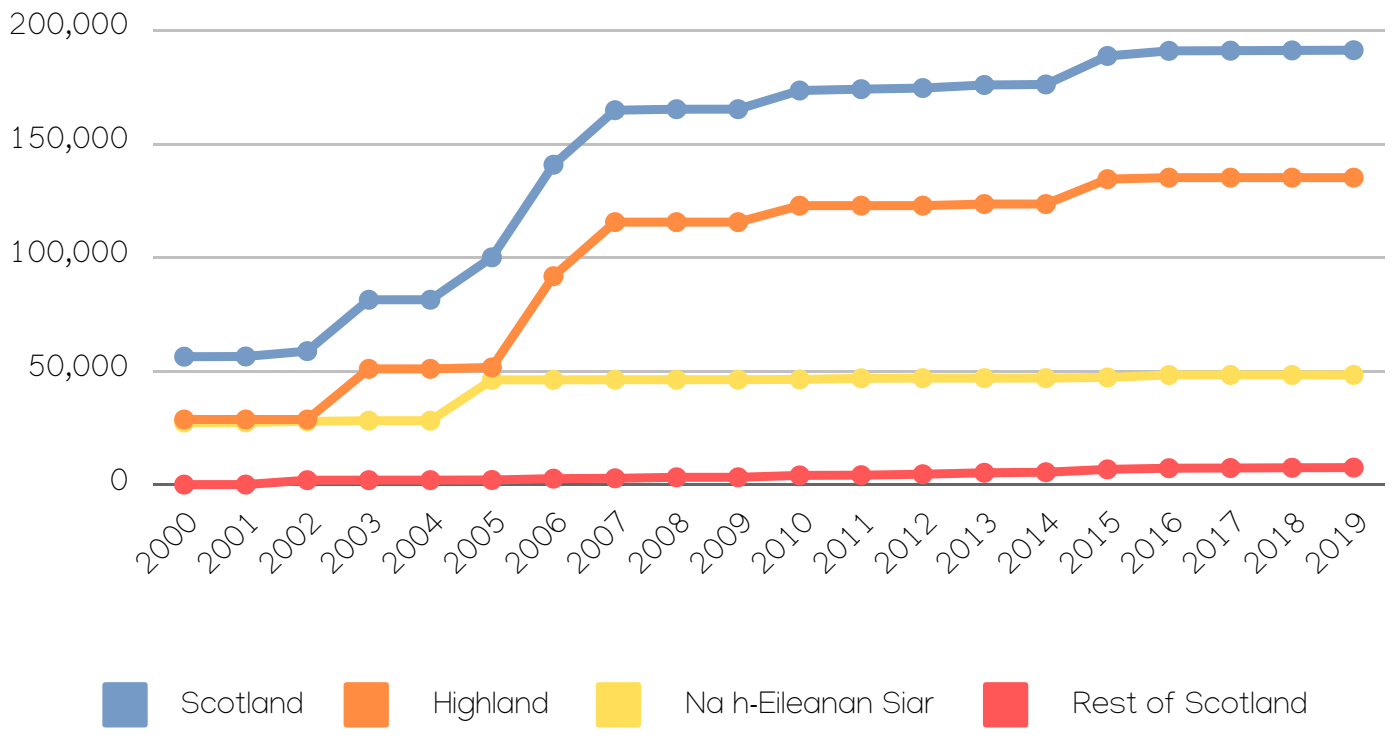
[26] The higher estimate includes land owned by grassroots NGOs which are not communities of place. J. Hollingdale, pers. comm.

Continental Europe provides a wide range of models whereby the 'community' that owns a forest may be defined by place, or interest, or by family. Hence those living together in a village may all share equally in their community forest, or may have different sizes of shares, or some of the joint owners may live far from the village, which means that only some of the current members of a village are owners of the community forest. So community forests do not always translate into equal benefits for everyone.

Europe can serve therefore as a source of inspiration, while not providing ready-made options that are necessarily suitable for Scotland (Harrington et al. 2008).

It is often assumed that community ownership maps onto a geographical community, but communities of interest are becoming more significant in Scottish land ownership and governance. During the Local Governance Review 2018-19, three fifths of the conversations involved communities of interest or identity. Asset Transfer is available to communities of interest but (unlike geographical communities) they are not supported by the Scottish Land Fund.

Figure 12: Changes in community land ownership (not forest ownership) 1990–2018 (ha)



NGO ownership is not distinguished separately in forestry statistics. A review for Scotland's Land Reform Policy Review in 2013 found a total of 207,000 ha of land owned and managed by environmental NGOs in Scotland, amounting to 2.6% of Scotland (McMorran and Glass 2013). NGOs including Trees for Life, Borders Forest Trust, John Muir Trust and National Trust for Scotland include some of the most notable examples of native woodland restoration in Scotland but unpublished data suggests this represents only a small fraction of the land owned by NGOs.

Shared management: as noted above, ownership is represented by multiple property rights. There are ways of sharing some of these property rights without being the legal proprietor of the forest. This is what 'community forestry' means in many countries (Teitelbaum et al. 2006, Springate-Baginski and Blaikie 2013), including what is often considered the most successful example in Nepal, but these models have not been widely adopted so far in Scotland.

lPartnership and joint management between the public forest service (i.e. FLS) and local communities has been promoted in the past but has not met with great enthusiasm by either party (Lawrence et al. 2014).

It is an under-utilised approach to maximising the public benefits from forest management and as a route to opening up wider involvement in forest management.

One area which is opening genuine economic opportunities for communities is the development of joint ventures in community hydro schemes, whereby FLS provides favourable terms to communities leasing river courses on the national forest estate [29] but genuine joint management of trees and forests has not yet materialised.
There is also under-utilised potential for communities to work with NGOs to manage woods for timber or other products i.e. coppice.

Linking ownership and land use: finally, in this section it is worth giving some consideration to the types of land use favoured by different types of landowners. We have to rely on general observation rather than research in describing some broad patterns.

On the whole, it is fair to say that commercial forestry is owned by absentee investors, estates and (less commonly) farmers. Mixed forestry tends to be owned by estates, while most farm forestry consists of relatively small conifer plantations and remnant, often heavily over-grazed patches of native trees. Communities own a wider range of woodland types, and there are several examples of large coniferous community forests in the Highlands and Islands.

[29] https://forestryandland.gov.scot/what-we-do/renewables/community-benefits

Chhusang farming community
Jean-Marie Hullot (CC BY 2.0)

Community members collecting grass in Kumrose Community Forest, Nepal
USAID (Public Domain)

COMMUNITY FOREST USER GROUPS IN NEPAL

About one third of Nepal's population is included in nearly 20,000 Community Forest User Groups (CFUGs) which manage a third of the total forest area in the country following a model whereby formally registered CFUGs manage and use their local forests under supervision by the District Forest Officer, in turn under the Department of Forests.

Ownership remains with the state, but CFUGs acquire the management rights through a careful process defined under the 1993 Forest Act and subsequent revisions and regulations (Hull et al. 2010, Sapkota et al. 2020). The CFUGs of Nepal have attracted international donor programmes (Bluffstone 2018)and are the focus of hundreds of academic papers, providing an enormous resource of experience and example.

Research focuses on the management decisions made by CFUGs (development and relevance of appropriate inventory and forest management methods, inclusion of non-timber forest products) (Hull et al. 2010, Toft et al. 2015), benefits for community members (Gauli and Hauser 2009), challenges of including poorer community members in forest governance (Yadav et al. 2015), and outcomes of community management for forest quality and biodiversity (Lawrence et al. 2006, Fox 2018). One of the most common is the tendency for wealthier and higher caste groups to capture both decision-making and benefits (Bhusal et al. 2020). On the more positive side, the World Bank concludes that open access forests appear to contain only about one-third of the carbon of forests that are governed by community groups (Bluffstone 2018). Recent reviews conclude that community forestry has better biological outcomes than socioeconomic benefits (Tripathi et al. 2020) while others conclude that community forestry has become a strong local institution capable of delivering multiple benefits (Aryal et al. 2020).

In many ways Scotland's move to community forestry has more in common with countries such as Nepal, where the shift is characterised by recent policy intervention, than continental Europe, where community forests have existed for centuries and are part of the mainstream approach to forestry (Lawrence et al. 2020). As a model for shifting management to communities, without changing state ownership, there is much to learn from Nepal. Some of the challenges in Nepal may be similar to those experienced by communities in Scotland, including technical skills and the information base for forest management, and trust between forest authorities and community members.

Others may be avoidable – with good governance mechanisms in place, Scottish communities should be able to provide benefits equitably or to those who most need them. But a formal shift of management from the state to communities on a scale that imitates Nepal would require enormous institutional change, and detailed consideration of the transferability of experience and evidence from Nepal and other community forestry programmes around the world.

Community forestry in Nepal
Bosteksten via Wikimedia Commons (CC BY-SA 4.0)

Crianlarich Community Woodland
cc-by-sa/2.0 © Greg Fitchett
geograph.org.uk/p/5174825

Communities often aim to diversify both species and forest structure when they become owners [30]. Local authorities own a mixture of woodland types, sometimes including former estates, which have often become important recreational sites [31].

Two landowner types are particularly active in afforestation. High net worth individuals and investment funds are leading stakeholders in the rapid expansion of new conifer plantations, while environmental NGOs such as RSPB, Borders Forest Trust, Trees for Life and National Trust for Scotland are leaders in ecological restoration with woodland (Ashmole and Ashmole 2020). A few private landowners are making notable contributions to native woodland recovery, particularly through effective deer management. These include longstanding Scottish owners of estates such as the Seafield and Strathspey Estates, and Glentanar; and a number of overseas owners of whom Wildland [32] is notable both for results on its extensive lands, and for involvement in the Cairngorms Connect landscape scale partnership [33].

Community landowners have to date been much less involved in new woodland creation. A quick and non-representative survey for this report suggests a variety of reasons. Some of the easiest land to buy is from the National Forest Estate, through CATS (and before that, NFLS). The benefits of planting bare land are slow to materialise, and to provide the rewards experienced by investors need to be carried out at scale and focusing on 'productive conifer', an approach that is not usually preferred by communities.

The development of planting applications requires investment and time. Knoydart Forest Trust is one community group that has created significant areas of new woodland on land owned by the community, and by neighbouring estates. There are clearly unfulfilled opportunities here for communities, and for the Woodland Nation vision, which could be addressed with support tailored to the community sector.

Knoydart Forest Trust

In 1999 the community on Knoydart was successful in buying the estate that they lived on. Two organisations were established: the Knoydart Foundation which owns Knoydart Estate, and Knoydart Forest Trust which manages the estate's woodlands and, increasingly, those of neighbouring private landowners. By first building its capacity in managing community land, the Forest Trust built confidence between the community and private sectors.

[30] See for example the feasibility studies and management plans included in community proposals to the CATS https://forestryandland.gov.scot/what-we-do/communities/community-asset-transfer-scheme

[31] For example Muiravonside Country Park owned by Falkirk Council https://www.falkirk.gov.uk/places/parks-estates/muiravonside-country-park.aspx. Note as previously mentioned that local authorities have variable management capacity and information about their properties.

[32] https://wildland.org/

[33] http://cairngormsconnect.org.uk/

It wanted to expand and enhance native woods and diversify non-native woodlands whilst also developing employment and economic activity, to produce locally useful timber and to encourage access to and enjoyment of woodlands. The long term vision is to link up the woodland habitat across the Knoydart peninsula from Loch Nevis to Loch Hourn. Since 1999 KFT has planted over 500,000 trees, helping to create over 300 hectares of new woodland on community land, plus eight new planting schemes on neighbouring, privately owned land.

Changing ownership

Current trends: private forest ownership is increasing in Scotland as a result of two trends: most of the new planting is on private land, and some public forest is being privatised [34]. Far from diversifying, however, ownership is being concentrated in the portfolios of the super-wealthy [35].

Privatisation is a global trend. Although during most of modern world history, most forests have been owned by the state, this balance varies across Europe and private forests are increasing, both in area and in proportion of the total forest (UNECE/FAO 2020). In former communist Europe, national forests are being restituted to private owners and communities. In central and western Europe new forests are growing on private land, as a result of rural land abandonment (central and southern Europe) and new forest planting (in the more densely populated countries of western Europe) (Konrad and Szymon 2015, van der Jagt and Lawrence 2019).

The Scottish situation differs in one important way. Across much of continental Europe the average size of private forests is decreasing, partly as inherited forests are subdivided among descendants. The fragmentation of forest properties in central Europe is often seen as a 'problem' by foresters, although not necessarily by the forest owners (Weiss et al. 2019b). In Scotland there is no indication that the size of forest properties is decreasing. In contrast in Scotland properties often come on the market as hundreds or thousands of hectares. Sometimes opportunities to subdivide them into lots arise, often to facilitate the separate sale of buildings such as shooting lodges and estate accommodation. Under pressure from advocates of more democratic ownership [36], FES (and now FLS) has occasionally broken sales down into lots but without attracting smaller scale buyers.

[34] Until recently a supply of land from public ownership was provided by the New Woodland Investment Programme which aimed to 'rebalance' state-owned forests. Since the policy started in 2005, statistics to 2018/19 show total sales of 53 056 ha (of which 51144 ha was plantations), and total acquisitions of 32 933 (of which 29 152 ha was bare land). Hence NWIP represents a net decline in state land ownership, even more so of forestland. https://forestryandland.gov.scot/business-and-services/buy-land-or-buildings/new-woodland-investment-programme

[35] A Times article in 2019 declared 'Super-rich buying up Scotland's forests' (The Times 2019) A Times article in 2019 declared 'Super-rich buying up Scotland's forests' (The Times 2019)

[36] http://www.forestpolicygroup.org/blog/how-to-create-lots-of-forest-owners/

Moving towards more smaller scale forest ownership is an unusual policy challenge. Across Europe this trend is more often seen as problematic by policy makers and advisors (Konrad and Szymon 2015, Mc Morran et al. 2018). However the problem in Scotland is very specific: land ownership is extremely concentrated and public policy has a role to play in addressing this. Various policies have not fully engaged with this. The land reform policies developed so far do not fully address this, and the Scottish Land Commission highlights the need for a 'significant and proactive focus on stimulating a more diverse private sector… and a more dynamic ability for communities, businesses and individuals to access the land they need.' (Scottish Land Commission 2019).

This diversity is not something to be afraid of. Yet Scottish Government removed references to 'a more diverse pattern of land ownership and tenure' from the consultation version of Scotland's Forestry Strategy. The only reference to ownership in the final published version is to community owned forests, which are important but not the only means to diversification of ownership.

Land markets: change in landownership through the open market is slow, so to achieve the scale of ownership change that is envisaged here, will require significant intervention. Data on turnover through the open market in land sales can be inferred only indirectly from a range of sources which indicate:

- The UK Forest Market Report notes that 78% of UK's recorded forest land sales were in Scotland last year [37].

  The UK total is reported as 14,235 ha gross of which 11,024 hectares are suitable for forestry. Overall then, we can infer that about 8,500 ha usable forest land changed ownership in Scotland, and presumably much of that was already planted.

- Sales of estates might be seen as offering the greatest potential for large scale land use change. The Strutt and Parker Scottish Estates Market Review reports that demand is higher than supply. 36 estates were for sale in 2019; 21 estates were marketed of less than 2,500 acres; 10 estates were marketed of over 5,000 acres; 37% of buyers were from overseas. This might suggest a rough total of about 40,000 ha (100,000 acres) of estates. Interestingly they report that the 'most attractive estates are those which offer a 'blank canvas' which enables purchasers to invest - particularly in carbon storage, rewilding and forestry'. [38]

- Savill's Farmland Market report for 2020 indicates a new record low in 2019 with just 117,000 acres publicly marketed across Great Britain. Scotland recorded a 44% drop in supply to 25,000 acres (10,000 ha). [39]

[37] https://www.johnclegg.co.uk/forest-asset-management/uk-forest-market-report/

[38] Strutt and Parker Scottish Estates Market Review https://rural.struttandparker.com/article/scottish-estate-market-review-spring-2020/

[39] Spotlight UK Rural, The Farmland Market 2020, Savills Research

In summary this patchwork of sources suggests that less than 1% of Scotland's land area changes ownership every year. Less than that is already stocked with trees. A smaller proportion still is suitable for new planting. Sales are large scale, private sales are a significant proportion, prices are high [40], and the current markets do not provide a forum for diversifying ownership.

Supporting change in ownership

The vision expressed in the Green New Deal requires substantial shifts of land ownership from the private sector to the public, community and small scale or family ownership. So if change is slow, and opportunities for change are few, what mechanisms are available to support the kind of widespread woodland ownership envisaged by the Green New Deal?

Land Reform: Scotland has legislative support for some aspects of this shift, including two Land Reform Acts (2003 and 2016), the Community Empowerment Act (2015), a Land Rights and Responsibilities Statement and a Land Commission which is applying itself admirably to the gathering and analysis of evidence. Mechanisms include the Community Right to Buy for private land when it comes on the market (subject to many restrictions), and Community Asset Transfer for acquisition of land from public bodies, even if the land is not on the market.

Despite these frameworks and mechanisms, change is slow, involves large inputs of public money and support, high levels of stress and voluntary time by community members. Attempts to use the Comunity Right to Buy have a low success rate (Mc Morran et al. 2018). Recognising the challenge, policy has dropped the target of one million acres in community ownership by 2020. Experience around the world shows that substantial structural change in land ownership has not been achieved by incremental steps. Land reform more commonly involves transfer of land rights to many small scale individual farms (Liu 2001). The emphasis in Scotland on community land reform is unique (Bryden and Geisler 2007), and while necessary, it is too slow and ignores the need for wider, more diverse and accessible land ownership.

Community acquisition: Scotland has decades of experience with community acquisition and much of that experience has been difficult. Communities have had to find large sums of money, navigate complex requirements, demonstrate their competence to manage business and land in ways that are not required of private purchasers. Overall the experience of asset acquisition can be described as exhausting, traumatic, and occasionally thrilling when successful. Many describe situations where they have not been successful.

[40] Interventions favouring more appropriate land use such as strict control of muirburn and licencing of driven grouse moors could lead to a reduction in land values with more estates on the market. Changes in agricultural subsidies as a result of Brexit may bring more land to market depending on how the subsidies are structured.

A review of experience (Mc Morran et al. 2018) finds that negotiated transfers (usually involving both willing seller and willing buyer) are often the most satisfactory although even these take a long time and involve much paperwork. Community Right to Buy is experienced as onerous, adversarial and with a high failure rate. The schemes facilitating purchase of public sector forests are similarly experienced as onerous but most lead to community purchase. All of these approaches consume large amounts of time and energy both by the community purchaser and the seller.

Selling off state forests to communities is relatively easy when policy supports such transfers but even here progress has been slow and at great cost. Although Forestry and Land Scotland is taking a leading role in implementing the Community Asset Transfer Scheme, the scheme faces challenges of timing and community energy. After three years, 19 properties totalling around 600 ha have been transferred. Its predecessor the National Forest Land Scheme which ran for 10 years transferred around 4,000 ha to communities [41] during a period when 50,000 ha of national forest estate was transferred mainly to the private sector. [42] In the process, community bodies had to comply with a level of financial planning and scrutiny (e.g. assurances about sustainable management) that are not required of private purchasers.

The financial mechanism most significant in community asset acquisition is the Scottish Land Fund (SLF).

Available first in 2001, it restarted in 2012, with a budget of £10 million over three years, later increased to an annual budget of £10 million. This limits the scale of acquisition and leaves communities with increasing hurdles as land prices rise. In late 2020, several proposed purchases are still trying to find further millions to complete their acquisition (Riddoch 2020). These challenges reflect huge increases in land prices in recent years, as well as the concentration of enormous land areas in the hands of few owners. As SLF comes under increasing strain communities spend enormous amounts of time attempting to stitch together complicated co-financing proposals, and others abandon the attempt.

Arrangements which rely less on the exchange of large amounts of money, and more on shared management agreements, would relieve this pressure. Alternatively government agencies could transfer land to communities with burdens in respect of resale or development.

Mechanisms to support diversification of ownership: the slow pace of land reform, the financial challenges, lack of diversity and stressful process for communities have prompted much debate about alternative mechanisms to support change.

[41] Total transferred was almost 7,000ha of which 2700 ha went to environmental NGOs not to communities

[42] https://forestryandland.gov.scot/business-and-services/buy-land-or-buildings/new-woodland-investment-programme

The fiscal context is the focus of much criticism, including the very favourable tax situation of forestry businesses and the lack of land value tax [43] in the UK. Most of these issues are reserved to the UK government, and most need specialist analysis beyond the scope of this report. However, several important strands of the debate are summarised here. Several of these focus on market intervention and it is worth considering that the current levels of tax exemption of highly profitable industrial forestry businesses are also a form of market intervention by artificially inflating the value of land. Fiscal incentives such as conservation easements are well-established in the USA (Harrington, Curtis and Black 2008, McMorran and Glass 2013), but have been criticised as overly rigid in the face of climate change, and do not help to change the inequality of land ownership. The tax system could be used more effectively to encourage greater levels of investment in the social enterprise sector (MacPherson et al. 2019). One start-up is advocating crowd-funding forest purchase, but is challenged by perceptions of risk. Other financial mechanisms to support joint purchase for investors include Social Impact Bonds, Green Investment Bonds, and the Scottish National Investment Bank. [44]

A recent report from the Scottish Land Commission addressing concentrated ownership considers mechanisms, including legal powers to subject large land sales to public interest tests in special cases, in order to stop owners having excessive power; requirements for owners of large estates to draw up management plans that involve local communities; and powers to investigate cases where landowners abuse their power.

Others propose restraints on land price related to productive potential, requirements to sell in smaller units [45], and a requirement to live on the land owned (equivalent to the requirement for a crofter to live near to her croft, and also seen in continental Europe).

Purchaser-led mechanisms include share purchase (by individuals or as members of a community) through various legal mechanisms including Co-operative and Community Benefit Societies, and Community Interest Companies (Community Woodlands Association 2010). These approaches have not been much adopted in Scotland, partly because these models don't conform with legislation and are not therefore eligible for SLF support.

Transitional public ownership: the slow pace of land reform and the speculative discourse around mechanisms reflected in the previous section suggest that some lateral thinking may be required.

[43] E.g. https://www.opendemocracy.net/en/opendemocracyuk/why-scotland-should-adopt-land-value-tax/

[44] https://www.gov.scot/about/how-government-is-run/directorates/scottish-national-investment-bank-directorate/

[45] There are some market-driven cases of selling forest in small units. Private sector businesses profit from selling woodlands broken down into areas as small as 1 ha, to individuals and families in England where population density and broadleaf woodlands attract this kind of new woodland owner. The model is criticised for resulting in tiny units with no management. (Land Use Consultants 2007)

One mechanism for changing ownership would be to use state ownership as an intermediary. Under this model, a public land agency buys land as it comes to market, possibly through a priority system which allows it first refusal at an objectively set market value (e.g. by the District Valuer).

The agency then either sells the land on, in small units, or sells shares in the whole forest. The agency could start an ecological restoration process or set that as a criterion for access to land acquisition. Funds acquired from this re-privatisation would then be recycled into further purchases.

A similar idea has been proposed for Local Authority ownership to facilitate community or community benefit share purchase. The '100 Aker' concept would require starting capital of at least **£ ¼ - ½** million for the land, while the national concept would require a much larger fund to enable purchase of the much larger estates that typically come to market (e.g. **£**10 million).

Different terms (e.g. compulsory purchase) could apply where large scale national ownership is in the public interest, such as in national parks. This approach could be particularly valuable in driving landscape scale restoration in forest habitat networks followed by smaller scale ownership to manage, maintain and share in the benefits of the ecological network. A form of covenant or dedication scheme could be used to protect the new native forest from conversion to less ecologically valuable plantations.

Ancient oak woodland on Mull
Rural Matters (CC BY-NC 2.0)

Sharing management: a similar process could be used to avoid the challenges and strains of ownership transfer altogether.

Attempts to broker alternatives to ownership, such as leaseholds or 'woodlots' have struggled to find willing owners and as noted above, partnerships between communities and FES are scarce. With support and a high profile programme, the build-up of a publicly owned land bank specifically held for leaseholds or management agreements with communities and individuals could address many of the problems identified above. This scheme could have much merit for small scale forest-based businesses which want to manage woodland for the production of (say) quality softwoods or hardwoods for furniture, but struggle to take on the risk or capital costs of woodland purchase.

Alex Indigo
(CC BY 2.0)

Tuley tubes near Catheugh
cc-by-sa/2.0 - © Oliver Dixon -
geograph.org.uk/p/1802129

100 AKER WOODS

In response to the Climate Emergency, the desire of many people to plant trees (XR & others), the need to increase forest cover especially of native woodlands and the vision of Reforesting Scotland, we propose:

Each Scottish local authority (excluding the cities) identifies (and purchases if not already owned) an area of average agricultural land (grade 4 or 5 pasture) extending to around 100 acres (40 ha) with reasonable access.

A local woodland advisor draws up a simple and effective planting plan for the area, which may include deer management or fencing against deer and livestock, paths, events spaces, etc.

Local people (and other volunteers) are invited to gather seed, set up back garden tree nurseries, plant young trees on site, at fairly dense stocking, during a series of tree planting events.

The woods are maintained by local people and once established (5 years?) are either kept by the local authority, sold or given to an appropriate local community group or sold to a private individual, business or trust, guaranteeing open access.

If the new wood is sold, the local authority identifies a new area of land and repeats the process.

Each scheme would require start-up capital of approximately £250,000 for the land in addition to the costs of tree planting and protection (which vary with grant availability).

Idea by Donald McPhillimy, Reforesting Scotland

Advisory services

All of the above needs strong support services. Scotland's polarised forest composition and economy, and skewed ownership structure, puts us in an oddly divided situation. The industrial and investment sector relies on its own agents and there is a thriving sector of independent forest agents to support private forestry. But Scottish forest policy gives remarkably little attention to advisory services [46], and the specific needs of smaller, non-traditional and / or non-industrial owners.

Advice on low impact silviculture, diverse productive woodland, and small scale native woodland is in short supply, and forestry advisors work in a parallel universe to agricultural advisors (Lawrence and Edwards 2014).

There are some important exceptions. The Community Woodland Association has been providing support and advice to its members since 2003. Its role in delivering policy is recognised by the Scottish Government, which provides it with an annual grant against delivery of an action from the Scottish Forestry Strategy Implementation Plan. Several environmental NGOs provide advice and contract management services particularly in support of native woodland planting, for example the Woodland Trust, Borders Forest Trust and Tweed Forum in the Scottish Borders [47].

In continental Europe, forestry advisory services have a more central role and provide us with a range of models. Small and medium scale family forest owners are a core focus of state and private extension services, and increasingly participatory processes such as peer-to-peer knowledge sharing are important. Cooperatives are used for contracting services including advice (like the machinery rings in Scotland), and / or for harvesting and marketing. Current trends show advisory services evolving from a focus on timber to a wider range of ecosystem services, and from public sector funding to the private sector. Even there however there are gaps in advisory support for micro-enterprises and for non-wood forest products (Teitelbaum, Beckley and Nadeau 2006, White and Martin 2002)

[46] Historically, the Forestry Comission provided advice through its professional forestry staff. That role in the current Scottish Forestry has been much changed and the forestry authority role dominates staff time rather than promotion, outreach and advice.

[47] https://bordersforesttrust.org/borders-tree-planting-grant/

Scotland has some innovative models including the Argyll Small Woods Coop, which supports members through sharing information on their website as well as through knowledge-sharing and training events. [48] The Royal Scottish Forestry Society has established the Monitor Woods Scheme which has the capacity to support sharing of best practice. [49] There is demand for this kind of sharing of experience. The British Woodland Survey [50] found that woodland owners are more likely to collaborate for the purposes of sharing knowledge with fellow owners than to engage in other activities. The conclusions support more local networks and support for practitioners to share good practice. (Hemery et al. 2020)

Advisory services will also need to take on new messages, focusing on native woodland creation and management.

To achieve the desired quintupling of native woodland and natural forest cover will require a national support service that proactively builds on experience, raises awareness, encourages change, guides landowners to available support mechanisms and provides accessible technical advice including on appropriate silviculture, perhaps similar to the former Farming and Wildlife Advisory Group (FWAG). There is currently no such advisory support service available at national level. [51]

[48] https://www.argyllsmallwoods.coop/

[49] https://www.rsfs.org.uk/rsfs2018/news/news-2019/304-manager-for-rsfs-monitor-woods-scheme-appointed

[50] Results based largely on responses from England

[51] But see e.g. https://www.fwag.org.uk/about-fwag

Argyll Small Woods Cooperative

THE PEOPLE

Photo by Gary Ellis on Unsplash

In section 2 we reviewed the range of benefits from woodlands, and some different experiences and interpretations of those benefits. Some goods and services are private and available only to the forest owner or those contracted by the owner; some are widely distributed but not valued; and some are valued but not experienced. So several changes will help to increase public benefit from woodlands.

One is changing the woodlands to provide new and more diverse benefits, and another is changing ownership so that a wider range of people access the private goods. Section 3 and 4 looked at these. This section briefly explores two more: to increase understanding of each other's values and benefits from woodlands to make the discussion more transparent and move away from the current polarised discourse; and to enable a wider range of people to take part in decisions about forests.

Changing benefits and values

Talk of stakeholders in forestry usually includes the owners, the communities, forestry professionals, environmental NGOs, the industry and the public. In Scotland currently the industry and the NGO sector have the loudest voices, but in the Scottish Government, despite claims of being overlooked, the industry has by far the strongest influence. [52] Owners have power through controlling land use and having the opportunity to access very favourable financial incentives. Communities have little power to influence land use policy and practice, and the wider public very little. The situation is exacerbated by splitting the portfolio between the Cabinet Secretary for Rural Economy and Tourism and the Cabinet Secretary for the Environment, Climate Change and Land Reform. This means that an unbalanced power structure is shaping Scotland's forests.

Section 3 shows that industrial forestry based on low diversity single-aged conifer plantations dominates current trends of forest expansion.

In contrast, a well-organised alliance of environmental NGOs [53] favours native species and natural regeneration, but it calls for a balanced approach in which new woodlands deliver multiple benefits for climate, nature, and people, and more ecological commercial forestry delivers biodiversity enhancement alongside other benefits. [54]

Public and community attitudes to forestry favour the latter approach.

The biennial Public Opinion of Forestry surveys [55] repeatedly show that the public's top reason to support forestry with public money is providing places for wildlife to live. They also show increasing, and very high, support for forests as a means of addressing the climate emergency. The same themes keep appearing in studies of people's preferences, in 2008, 2012, 2013 and 2020 (Forestry Commission Scotland 2008, WEAG 2011, Lawrence and Edwards 2013, Lawrence and Tabor 2020).

It is clear that rural communities are not opposed to woodlands in the landscape, but rather to coniferisation in ways that undermine landscape value, erode tourism and recreation, and fail to provide opportunities for local woodland-based business. In 2020, a consultation on woodland creation in the Scottish Borders identified strong interest among most stakeholders to see more mixed land use and integrated land use planning, and a wish amongst most stakeholders to see more native woodland, including productive native woodland that supports local wood processing industries (Lawrence et al. 2020 [in prep]).

[52] The shift of priorities between the 2006 and the 2019 Forestry Strategies was widely remarked on by consultees. Industry was shifted to headline status, while community and ecology moved into the background.

[53] https://www.scotlink.org/our-work/our-land/woodlands/

[54] https://www.scotlink.org/publication/tree-and-woodland-expansion-principles-for-scotland/

[55] https://www.forestresearch.gov.uk/documents/5194/pof2017scot_gJ3O6gN.pdf

Communities for Diverse Forestry

A group started in South West Scotland in response to the high number of proposals for new forestry plantations.
There is already a very high % of land cover of existing commercial forestry plantations in the area. We have seen large amounts of habitat lost as a result of destructive forestry practices.

We want to see more native and broadleaf trees planted and more progressive felling practices in commercial plantations. We believe that the generous grant subsidies for planting Sitka spruce do not benefit communities or ecology.

https://www.facebook.com/groups/581843619140972/about

Values can and do change. Shared and cultural values are influential. People's values in relation to landscapes, land use and forestry are not fixed and static. As the landscape changes, and as society changes, it is likely that stakeholders develop different attitudes. One recommendation of the 2013 study was to bridge the culture divide between farming and forestry, through more holistic advisory systems (Lawrence and Edwards 2013).

Even more necessary now is to bridge the gulf that has arisen between the beneficiaries of commercial forestry, and those calling for a more multi-purpose forestry based on more natural processes and silviculture.

Large scale industrial conifer plantations do not guarantee local jobs and income. Reactions to coniferisation are strongest in the Southern Uplands and South West Scotland, where hill farm sales to forestry companies and subsequent afforestation has resulted in dramatic landscape and social change. Rewilding and native woodland restoration has also been accused of depriving local communities of jobs (particularly shepherding). It would be constructive to consider which kinds of forest are most related to local employment, a question that has not been addressed systematically.

A conference at Birnam at which local woodland based businesses explored their experiences indicated potentially more important roles for mixed woodland and native species, but there is also much unrealised potential for local businesses to work with conifers. Tree species diversity can provide timber for local processing and uses – for construction – carcassing [56], cladding, and finishing timber, for biomass, for firewood, and for fencing. Well-managed, open, and diverse woodlands provide opportunities for developing tourism facilities and experiences, for harvesting non-timber forest products, for local communities to harvest game and for the development of residential and recreational buildings, including forest lodges and hutting.

[56] Carcassing timber is kiln-dried treated structural graded softwood, predominantly used in the construction of floor joists, roof joists and timber framing - https://www.uk-timber.co.uk/

Small businesses can thrive in a forest landscape where several factors are at work. Small scale processing and the use of other non-timber forest products often strengthens the local economy through more local circulation of value in rural areas. (SFTT ILG 2019). In 2018 a study estimated that the total number of people connected with small-scale [57] woodland-related activities could be about 6,255 people, and their income and local spend amounted to an estimated £69.8 million per annum in Scotland (Watt and McGhee 2018). Woodland targets and new ownership structures can help this sector to expand, but only if policies are in place to encourage and support the sector and more effort is made to establish well designed and actively managed woodlands (Worrell et al. 2018). There are further advantages: support for local sawmills reduces timber transport. Financial assistance could be channelled through existing Scottish Government grant mechanisms with an emphasis on ease of access through the application processes.

Participatory land use planning

Forest policy and land use planning is remarkably centralised in Scotland, to a degree rarely found elsewhere (Lazdinis et al. 2019). In this final section we look at ways to involve stakeholders and the wider public in planning forestry, and in planning wider land use change including forestry.

Integrating forestry decisions with other land uses: Scotland's Land Use Strategy sets out a proposal for Regional Land Use Partnerships (RLUPs). This proposal has been reinvigorated by the Climate Change Act in 2019. Scotland's Forestry Strategy sits under the Land Use Strategy and the new energy in the LUS and RLUP processes overlaps well with the ambition for significant land use change, governed democratically. Decision processes around forestry sometimes seem to take place in their own bubble, and recent research and stakeholder consultations have highlighted the need for these land use processes to work together (Gimona et al. 2012, Muñoz-Rojas et al. 2015, Lawrence and Tabor 2020).

The Land Commission has been researching and consulting on the role and possible mechanisms for RLUPs throughout 2020, and describes them as "pivotal to driving and delivering on… making a just transition to a net zero economy" (Scottish Land Commission 2020). It concludes that RLUPs will work best if they are more than advisory: they must be empowered to take decisions, spend money and have effect on the ground. This is an active area of policy and governance development and the recommendations of the SLC indicate a direction of travel that fits with the Woodland Nation vision.

[57] A small scale forest business was categorised as a micro business, i.e. employing less than 10 people and a turnover less than £2 million

Great attention will be needed to two aspects.

First, wooded land uses must be planned within these wider land use processes and not in separate parallel processes where traditional power struggles are repeated. Scottish Forestry is currently developing three pilot woodland creation frameworks. The stakeholder engagement for the Scottish Borders showed that stakeholders were strongly in favour of planning woodland creation at landscape scale (i.e. at scales larger than most land ownership units), and of more diverse and integrated land use (Lawrence and Tabor 2020). Many also felt that this initiative should be integrated into the forthcoming Regional Land Use Partnerships.

Second, a key challenge is replicating the intentions of a regional land use framework at the level of individual land holdings, and how these fit with wider spatial processes. One approach is to use Land Management Plans as a regulatory and enabling mechanism to help planning at multiple scales. These could be required for all land holdings above a minimum size (say, 200 ha) seeking public incentives (including tax exemptions) and which would require compliance with codes of good land management practice (including UKFS, deer management, land rights and responsibilities). Incentives could be offered in proportion to the desired land uses, available at individual unit level until the regional target is met. However to work well, at the scale required to fit the Woodland Nation vision, this would need to be in a format that is easily implemented, without excessive paperwork, hierarchies and delays.

All of this naturally needs to be aligned with the principle that public funds are used for public benefits, as defined in policy objectives.

Stakeholder engagement with forestry planning: The LUS notwithstanding, there is also a role for more effective stakeholder engagement with forestry planning and practice. The current SFS has moved away from engaged governance with the loss of the Regional Forestry Forums (RFFs).

Five RFFs were set up under the 2006 Scottish Forestry Strategy to advise FCS on the regional implementation of the Strategy and to identify and monitor their region's issues and priorities (Mc Morran 2008). This aim has been abandoned in the new (2019) SFS with the loss of an important mechanism for good governance. A brief survey of experiences of former members suggests that most felt that they were valuable in acting as a sounding board for public forest agencies, industry representatives and other stakeholders. Most also noted that the RFFs could be improved through, for example, more effective decision-making power and better stakeholder representation, but felt that they should have been developed rather than abandoned. The experience of RFFs has not been evaluated and analysed. There is potential to develop and use RFFs to deliver a much greater advisory role at a regional level and as a place to help resolve local tensions and strategic issues.

A separate but connected need is for more participatory governance of Scotland's public forests. International approaches provide value pointers (see below).

Finally, reviews draw attention to the difficulties in including communities in the consultations on new forestry proposals for planting, roads and felling. This process is the subject of much confusion and complaint, despite attempts at refreshing and streamlining it (Mackinnon 2016, Lawrence and Tabor 2020). It has been suggested that it should match the planning system approach for ease of access and usability, and to inspire greater confidence in the process.

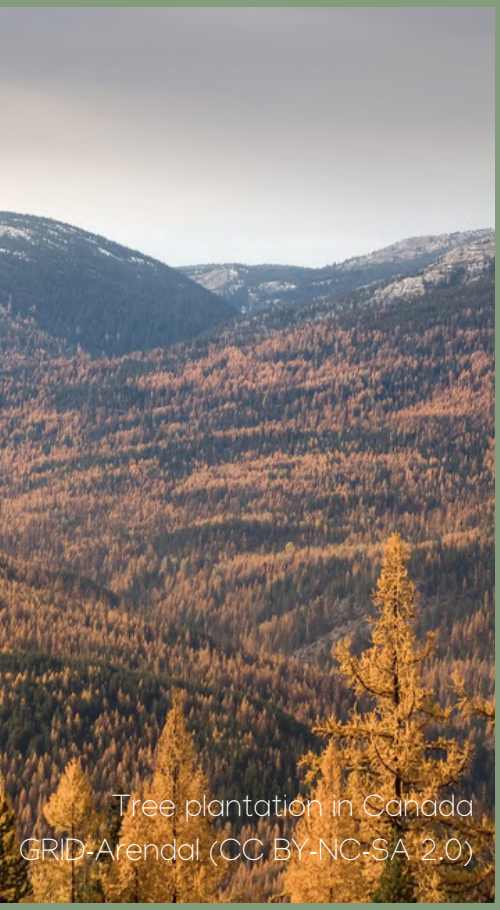
Learning from international experience: International experience provides a range of models, both for regional forums and for public forest committees. These point to the need for forums to have clear purpose and remit; to proactively support the involvement of less powerful stakeholders; to respect forestry knowledge and non-forestry knowledge; to go beyond debate of the issues and have means to make and implement decisions, and to be allocated sufficient resource to function and implement decisions. It is evident that successful models depend on the context, including the ownership and tenure structure, the level of community dependence on employment in forest industry, and cultural expectations of participation. They also need the trust and commitment of the government bodies that are engaging them.

Collectively this international experience shows that Scotland is not alone in confronting this challenge of genuine engagement in forest governance. Instead of abandoning the RFFs and their cumulative experience, policy should build on them, learning from the experience of former members.

Regional forestry forums which are tasked to work with the RLUFs could translate the vision of the New Green Deal into local realities based on ownership, economic, climate and soils, advise on appropriate balance of woodland types and approaches to achieve that.

The Woodland Nation vision is radical, so these forums need to be equipped to share experience and evolve. They need to be able to translate their assessments of evidence and experience into local actions that achieve the vision. In this sense, they could act as citizen panels, selected to navigate towards this reforested Scotland by drawing on combined technical (e.g. silvicultural, climate, biodiversity), social (e.g. community development, behaviour), legal (e.g. land ownership, fiscal) and facilitative expertise. Panels of this type, supported by changes in land ownership, cultures of public bodies, financial incentives and integrated advisory services, could move us towards a Woodland Nation.

Oregon Board of Forestry tour of forestland (CC BY 2.0) Sam Beebe



Tree plantation in Canada GRID-Arendal (CC BY-NC-SA 2.0)

INTERNATIONAL EXAMPLES

Community collaboratives on public land

In the United States, over 191 million acres of land is managed by the United States Department of Agriculture Forest Service. In several western states, organized collaborative groups provide sustained input on management decisions on much public land. A study in Oregon found that the perceived success of such collaboration is related more to process than to outcomes. However differences in socioeconomic status and motivation affect the ability of agency and nonagency participants to develop and achieve mutually-desired goals. (Davis et al. 2017)

Round tables

Stakeholder roundtables were used in Castilla y Leon, Spain, to bring forest policy makers, planners and scientists together to develop a forest mobilisation strategy. It was considered a major development in governance, producing a more effective strategy (Junta de Castilla y León 2014)

Public advisory committees (PAC)

In Canada, public participation is mandated by federal and provincial policy and is a key part of forest certification processes (McGurk et al. 2006). In this context, self-reports of committee effectiveness and satisfaction are common indicators of meaningful governance. A national survey found that that personal perceptions of fairness, inclusion, and ability to learn as a group affect judgments of committee effectiveness and satisfaction (Nenko et al. 2019). Indigenous members were less likely to feel that the PAC process is fair, they are not confident in raising their concerns, and are less likely to agree that they are able to influence forest decision-making. Other research shows women and non-industrial stakeholders less likely to participate. Statutory arrangements can often lead to stalemate if captured by vested interests with partisan views.

Elected regional natural resource management boards

Australia has 56 community-based regional NRM boards of management with responsibilities for delivery of two major national programmes. Evaluation found that board members need to be supported and financially resourced, and that some regional actors are marginalised from decision-making. Governments need to streamline programme administration, introduce greater clarity and consistency in bilateral agreements, enable regional flexibility and capacity building measures and ensure consistent resourcing. (Robins and Dovers 2007)

Multi-stakeholder forest steering committees

Bavaria's Mountain Forest Initiative (Bergwaldoffensive) was launched in 2009 by the Bavarian Ministry of Food, Agriculture and Forestry to restore the protective function of the vulnerable alpine forest in light of climate change. To achieve this goal and create a general sense of ownership in the process, the Mountain Forest Initiative seeks the involvement of local stakeholders (e.g., private forest owners, land-use related authorities, hunters, nature conservationists, and tourism associations). The guidelines encourage the establishment of multi-stakeholder mountain forest steering committees and project-based forums to advise forest agencies in defining and implementing measures. However the 'advisory' nature of these forums meant that forest agencies could (and some did) ignore them in practice.

Natural Resources Adelaide officer removing khaki weed (CC BY 2.0) Friends of Aldinga Scrub.

Beech forest in the Spessart Nasenbär CC BY-SA 3.0.

THE PATHWAY

Carstramon Wood, Dumfries and Galloway
CC BY-SA 2.0 Gerry Zambonini

How can we achieve a forested Scotland owned by the people? The Forest Policy Group was asked to consider how to achieve the following three goals:

1. 40% of Scotland's land forested
   60% native woodland

2. A shift to more socially just
   land ownership

3. More democratic forestry
   decision-making

1 40% of Scotland's land forested 60% native woodland

There is sufficient suitable land in Scotland to achieve this target. A feasible target date could lie between 2040 and 2120.

Scotland's forest expansion should prioritise a more diverse range of species and forest management systems, supporting a move towards a spectrum from continuous cover productive forests, through mixed woodlands to protected conservation woodlands. There is a need to proactively stimulate woodland creation which lies between the two current poles of money-oriented clearfell and restock exotic conifer, and biodiversity-oriented native woodland restoration.

The target of increasing the area of native woodland by a factor of five should be treated as an opportunity to create timber-producing native woodland and mixed forests, as well as ecological restoration.

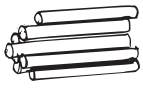
The recommendations of the Deer Working Group should be implemented in full, with the addition of a target deer stocking density of 1-3 / hectare.

Agricultural subsidies, forestry grants and fiscal measures should be restructured to support this range of new woodland creation, including measures to incentivise removal of competition from livestock and deer. The Scottish Forestry Grant system needs to be rebalanced away from the current overly generous subsidies for industrial conifers, towards enhanced grant rates for native conifer and native broadleaved woodland, some of which can be targeted at actively managed productive broadleaved and mixed woodland.

Legislation should be introduced to ban muirburn and licence game shooting.

Advisory services should be expanded, building on the experience of existing organisations with experience in native woodland establishment.

Seed and seedling provision should be increased to support this level of native woodland establishment.



The development of Scotland's timber industry to strengthen demand for diverse and quality Scottish timber and non-timber products, will enhance the economic value of native and mixed woodlands.

Business development and appropriate technology support to enable the growth of small-scale local forest businesses will enhance the contribution of woodland expansion to the rural economy.

2 A shift to more socially just land ownership

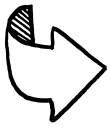
The currently exceptionally high concentration of land ownership needs to change to allow the benefits of woodland ownership to reach more people, and a more democratic range of values to be applied to land management decisions.

Data about land and forest ownership in Scotland needs to include all land, and provide more useful categories of ownership to monitor change and social justice.

Public ownership should be enhanced through a more public-facing national forest agency, and through political support for local government forest ownership and woodland creation.

Support arrangements which rely less on the exchange of large capital sums, and more on shared management agreements. Support should be explored for joint forest management, community forest user groups, management agreements, leases and woodlot agreements between communities and small scale woodland managers, and public landowners, NGOs and large scale landowners.

Mechanisms to support woodland creation by community landowners should be developed.



Public forest agencies and local authorities should act as intermediary owners to facilitate the transfer of ownership between single large owners and multiple smaller-scale owners.

Mechanisms proposed by the Scottish Land Commission and others to reduce concentration of ownership (e.g. public interest tests, statutory community engagement and joint management plans, requirements to sell in smaller units, and a requirement to live on or near the land owned) should be considered, and the most promising should be implemented.

Financial models for supporting land and forest purchase, such as cooperatives, community benefit societies, crowdfunding and share purchase should be developed and promoted.

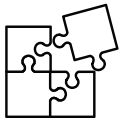
An evaluation of the impact of fiscal incentives on forest composition, ecosystem services and distribution of benefits should be commissioned, with proposals for addressing current inequities including consideration of Land Value Taxation.

Support innovative advisory services delivered through a diverse range of mechanisms, building on the examples of cooperatives and NGOs highlighted in this report, and experience from continental Europe and the USA. These services need to provide new content on more diverse and resilient forestry, tailored to a more diverse range of landowners and woodland managers, and relying on knowledge exchange to learn from experience.

3 More democratic forestry decision-making

Public debate should be stimulated and supported to encourage shared understanding of woodland values and benefits to move the discussion on from the current polarised discourse, and to enable a wider range of people to take part in decisions about forests.

More holistic and effective ways should be found to bring the forestry, climate change, land reform and biodiversity portfolios together in the Scottish Parliament and Government.



Forestry should be planned in an integrated way together with other land uses under the national Land Use Strategy and the evolving Regional Land Use Strategies and Partnerships.

Evaluate experience and develop a new generation of regional forestry forums, learning from the experience of former members. Develop RFFs which are tasked to work with the RLUFs to translate the vision of the New Green Deal into local realities.

Public forests should prioritise delivering local economic and environmental benefits to local communities. This could be achieved through regional forest committees or boards building on experience from North America. At the same time the public forest service should evolve to have a more a public-facing culture to ensure public benefits from public forests.

The current forestry decision-making process should be at least as open, accessible and accountable as the current local planning consultation process operated by Planning authorities.

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