Timber and forestry

Our forests provide a range of benefits, including providing timber and removing CO_2 from the atmosphere.

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Summary

Woodlands and forests deliver many benefits: fostering and supporting jobs, education and skills development; contributing to the recreation, tourism and health sectors; and offering accessible green space in urban areas.

Scotland's forest resource is a vital component of climate change mitigation and underpins our value-added forest industries and the fast developing wood fuel sector.

It is hugely important to our landscape and offers a range of habitats that nurture and enhance Scotland's biodiversity.

The Gross Value Added (GVA) of the forest industries in Scotland including forest-related tourism is £670 million, supporting 31,000 jobs, mostly in rural areas.

Introduction

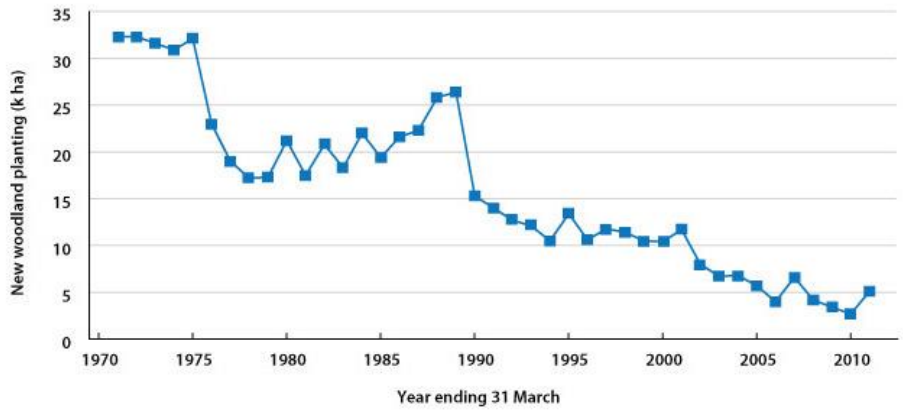
Despite excellent conditions for growing trees, Scotland has, for historical reasons, significantly less woodland than many other countries in the world.

The history of Scotland's resource is set out fully in wildlife: woodlands and forests.

By the beginning of the 20th century, woodland cover in Scotland had declined to 4.5%. The formation of the Forestry Commission and subsequent introduction of a state afforestation programme in 1919 led to a steady increase in the woodland area. Initially, this comprised mainly coniferous plantations but has since developed to encompass a wide diversity of woodland types.

There was a major period of forestry expansion through the 1970s and 1980s. During the 1990s, new woodland creation averaged over 10,000 ha per year with a greater emphasis on native woodlands than previously. More recently, planting rates had fallen, to only 2600 ha in 2009–10 (Figure 1), although this rose to 5100 ha in 2010–11. Over the next 10 years we expect to see the continued expansion of Scotland's woodland area.

Figure 1: New woodland planting 1970–71 to 2010–11



Source: Forestry Statistics 2011: Woodland Statistics

Scotland's forests are a significant economic resource. The Gross Value Added (GVA) of the forest industries in Scotland including forest-related tourism is £670 million, supporting 31,000 jobs, mostly in rural areas.

Description of timber and forestry products

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In 2011, the area of woodland in Scotland was 17.8% (1.39 million ha) of the total land area, compared with 5.6% in 1924 and 11.8% in 1980.

Of this, Forestry Commission Scotland manages around one-third of the forest resource, known as the National Forest Estate, on behalf of Scottish Ministers. The remaining two-thirds is owned by private owners as well as Environmental Non-Government Organisations (ENGOs), community bodies and public sector organisations.

The distribution of Scotland's woodland can be seen in Figure 2. This map uses data collected as part of the new National Forest Inventory, which will deliver key information about Scotland's forests over the coming years.

Figure 2: National Forest Inventory woodland area map for Scotland – broadleaf, conifer and mixed woodland

It is estimated that 78% of the woodland area is coniferous and 22% broadleaved woodland.

The species mix, based on 1995 data, estimated that Sitka Spruce made up 47% of the total woodland area with pine (of all types) making up 24%. The most common broadleaved species was birch occupying around 7% of the total woodland area. The species mix will have changed, to at least some extent, since 1995 with the greater planting of broadleaved species both in new woodland creation and when restructuring plantations following harvesting. Updated figures will be published as an output of the National Forest Inventory.

Timber harvest

Scotland's forest resource provides large volumes of wood fibre for Scotland's timber processing industries. Scotland's timber harvest in 2010 was 6.2 million green tonnes (fresh timber weight) with production split evenly between the National Forest Estate and the private sector. This was the highest harvest in Scotland's history, and was roughly two-thirds of the UK timber harvest in 2010.

The timber harvest is expected to continue to rise over the next 10 years, mainly as a result of increased felling in the private sector, before levelling off and declining. The increased harvest is largely the result of the large number of trees planted between the 1960s and 1980s reaching felling age. A new Softwood Production Forecast will be published in 2012 as part of the National Forest Inventory, setting out the size of the forest softwood resource and the potential availability of wood fibre over the next 25 years.

Contribution to the timber processing sector

Scotland's forest resource sustains a modern and growing timber-processing industry. In 2009 there were 69 sawmills (of which 27 are larger mills, each producing more than 10,000 m^3 of sawn wood per year), three wood panel mills and one pulp and paper mill primarily using homegrown wood fibre.

In 2010, 1.6 million m^3 of sawn softwood was produced by sawmills in Scotland. The three main markets for sawn timber are construction, pallets and packaging, and fencing and outdoor products.

The three wood panel mills together produce over 1 million m^3 of panels annually. Scottish-produced wood panels are widely used in construction, interiors and furniture.

Contribution to the wood fuel sector

Scotland has a rapidly developing wood fuel sector. Wood fuel is a low carbon, renewable form of energy but because the forest area is limited, care has to be taken to use it efficiently.

Wood fuel use has quadrupled from a relatively low base in 2004, to around 1.2 million green tonnes in 2010. Thirty-one per cent of this is recycled or waste wood. Additionally, Scotland's four wood-pellet manufacturing plants used around 160,000 green tonnes of wood in 2010.

The Wood Fuel Task Force estimates that around 800,000 green tonnes of wood are potentially available from all sources of wood fibre after current demand from the wood-processing industries and wood fuel sector has been taken into account. However, much of this volume is brash and branchwood, which is more difficult to use for wood fuel. The available volumes could more than double over the next 10 years if forecast timber volumes are brought to market. Some of the volume will be suitable only for wood fuel, but competition is likely to be strong for other parts of the resource such as sawlogs and small roundwood.

Contribution to other renewable energy generation

Scotland's forests already play host to a number of wind farms, including the largest in Europe at Whitelee Forest in Lanarkshire. Forestry Commission Scotland is making a concerted effort to maximise wind and small-scale hydro projects on the National Forest Estate. It is estimated that by the year 2020, a total of 2 GW of power could be generated, enough to power 1 million homes.

Carbon sequestration

In 2009, woodland sequestered more greenhouse gases than it emitted, a total of 10.0 million tonnes CO_2 - which is 1.7 million tonnes CO_2 more than in 1990. Although carbon sequestration by woodland has increased since 1990, it is important to note that this peaked around 2004. This is because levels of woodland creation in Scotland declined in the 1990s and many Scottish forests are becoming older. Older trees sequester CO_2 at a slower rate than younger trees.

Contribution to tourism and recreation

Forest tourism contributes £209 million to Scotland's economy and sustains 17,900 full time equivalent jobs. Forest tourism includes:

- general tourism and recreation;
- adventure tourism such as mountain biking, walking and kayaking;
- wildlife tourism;
- cultural and heritage tourism.

Over 8 million visits are made to the National Forest Estate each year, providing benefits both to visitors and the local economy, for example over £9 million is being spent annually by 400,000 visitors to the 7stanes mountain bike trails in south Scotland[1].

[1] *The Economic Value of Mountain Biking in Scotland. A report for Scottish Enterprise. EKOS Ltd. 2009*

Pressures affecting timber and forestry products


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There are a number of pressures on the woodland resource. Most of these are potentially negative but some, such as habitat restoration and landscape improvement, are positive.

Land use change

The Scottish Government's Land Use Strategy notes that society's increasing demands and expectations, for example for more food, timber, carbon storage and biodiversity, can exert considerable and competing pressures on our finite land resource. The Land Use Strategy therefore has a crucial role to play in achieving a sustainable and more integrated approach to land use across Scotland.

In doing this, there will be the need to implement the Scottish Government's commitments to tree planting set out in Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022, the need to consider the Scottish Government's Rationale for Woodland Expansion, and the competing pressures on land potentially available for tree planting.

It is important to ensure that the right trees are planted in the right places. It is already recognised that the main focus of woodland creation will be away from prime agricultural land and also avoiding areas of deeper peat soil where the carbon losses from soil disturbance could outweigh the gains in climate change mitigation.

Woodland loss

In the last decade or so there has been significant woodland removal associated with improvements in landscape design, restoration of priority habitats, windfarms and other types of development. Forestry Commission Scotland has broadly estimated that woodland removal due to windfarm development and habitat restoration in the period 2000–2010 is around 10,000–20,000 ha. Notwithstanding this loss, Scotland's forest resource is still expanding.

Windfarm development has been a particular issue because the upland areas on which many forests were established are also often good sites for wind energy. Additionally, until recently, windfarm developers have been keen to remove forests on windfarm sites to maximise turbine performance; however, there is a growing awareness that turbines and forestry can co-exist, provided each are appropriately designed.

Threats from pests and diseases

Like all ecosystems, Scotland's forest resource is under threat from unwelcome pests and diseases, and steps are constantly being taken to monitor these, to prevent and manage outbreaks, and to minimise their impact.

Climate change and the expansion of international trade (which can introduce pest species) are likely to increase the threat posed to woodland in the UK by tree pests.

Two of the most significant concerns at the moment are *Phytophthora ramorum* and *Dothistroma* (red band needle blight), which have the potential to cause significant economic damage to Scotland's forest resource.

Climate change

The key trends expected in Scotland's climate in future are for hotter, drier summers and milder, wetter winters. We can also expect to see an increase in summer heat waves, extreme temperatures and drought as well as increased frequency and intensity of extreme precipitation events and reduced occurrence of frost and snowfall. These changes are likely to affect tree growth and the wider forest resource.

Large-scale biomass electricity

The developing wood fuel sector in Scotland has many positive aspects, including contributing to climate change mitigation through the production of heat and power, and greater demand for the forest resource bringing increased returns to forest owners. However, the UK Government's ambitions for large-scale biomass electricity generation have the potential to create excessive demand for wood fibre in the UK.

Consequences of a change in timber and forestry products

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The continued expansion of our forests will bring with it associated multiple benefits, including further carbon sequestration. The pressures on forestry should be mitigated by the requirement to practise sustainable forest management (see below), which helps to provide significant protection to this resource.

If the pressures highlighted above are not appropriately managed then there could be negative consequences.

Land use change

One of the aims of the Land Use Strategy is to seek to resolve issues around competing uses for land. If sufficient land is not available for new woodland creation then the benefits identified in the Scottish Government's Rationale for Woodland Expansion will not be realised.

Benefits of woodland expansion are:

- helping to mitigate climate change by storing carbon;
- restoring lost habitats and adapting to climate change;
- helping to manage ecosystem services;
- underpinning a sustainable forest products industry;
- supporting rural development;
- providing community benefits;
- enhancing urban areas and improving landscapes.

Woodland loss

There are clear biodiversity and landscape benefits from the restructuring of first generation forest plantations to create improved landscape design and open habitats. This will inevitably result in some loss of woodland area.

The loss of woodland, particularly softwood plantations, raises some risk to the supply of timber to the forest industries. However, there will be productivity gains through the improvements in tree breeding programmes

Climate change

Although Scotland's climate may not change as much as in other parts of the world, there are likely to be impacts on Scotland's economy, environment and society. The forest industries will have to adapt to the challenge of a changing climate. The relatively long period between establishing young trees and utilising harvested wood means that it will be very important to be aware of the likely changes in climate, its impact on site conditions, and the consequent changes in growth, forest ecology, and the ecology of pests and diseases.

Large-scale biomass electricity

The demand for wood fuel will have an effect on the forest resource. The requirement to practise sustainable forest management in the UK and to replant any trees that are felled means that the greatest impact is most likely to fall upon the forest industries, which are competing with electricity generators for the same finite wood supply.

Response by society


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Land use change

Sustainable forest management is a key plank of forest policy. The UK Forestry Standard sets out the standards for the sustainable management of all forests in the UK. Independent certification schemes for sustainable forest management such as the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification schemes (PEFC) are based on this Standard. In 2011, 57% of Scotland's woodland area (793,000 ha) was certified as sustainably managed, accounting for over 80% of all timber production. The whole of the National Forest Estate has dual certification from FSC and PEFC.

The 2006 Scottish Forestry Strategy has a vision of increasing woodland cover to 25% of Scottish land area by the second half of the 21st century. This was re-affirmed in the Scottish Government's Rationale for Woodland Expansion, which showed how this aspiration might be met. The Scottish Government's climate change commitments for new woodland creation requires planting rates to increase to an average of 10,000 ha per year.

In June 2010, Forestry Commission Scotland published The Right Tree in the Right Place, which provides guidance to planning authorities on the multiple benefits that can be derived from well-planned and well-managed woodlands and encourages them to prepare new forestry and woodland strategies to guide future woodland expansion.

The Scottish Government has established a Woodland Expansion Advisory Group to identify more closely which types of land are best for tree planting in the context of other land-based objectives, and to promote good practice and local processes in relation to tree planting so as to secure multiple benefits.

Woodland loss

Measures have been in place since 2009, through the Scottish Government's policy on the control of woodland removal, to minimise any woodland losses from future windfarm development.

The Scottish Government policy maintains a strong presumption in favour of protecting Scotland's woodland resources. Woodland removal should be allowed only where it would achieve significant and clearly defined additional public benefits. In appropriate cases, compensatory planting may form part of this balance.

Woodland removal, without a requirement for compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- enhancing priority habitats and their connectivity;
- enhancing populations of priority species;
- enhancing nationally important landscapes, designated historic environments and geological Sites of Special Scientific Interest (SSSI);
- improving conservation of water or soil resources;
- public safety.

Woodland removal, with compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- helping Scotland mitigate and adapt to climate change;
- enhancing sustainable economic growth or rural/community development;
- supporting Scotland as a tourist destination;
- encouraging recreational activities and public enjoyment of the outdoor environment;
- reducing natural threats to forests or other land;
- increasing the social, economic or environmental quality of Scotland's woodland cover.

There will be a strong presumption against removing the following types of woodland: ancient semi-natural woodland; woodlands listed as 'Plantations on Ancient Woodland Sites' (PAWS); or woodland integral to the value of designated or special sites. There will also be a strong presumption against woodland removal where it would lead to fragmentation or disconnection of important forest habitat networks.

Work is ongoing to more accurately determine the area of permanent woodland loss due to windfarm development and habitat restoration.

Threats from pests and diseases

The heightened threats from pests and diseases have required a more strategic approach to forest and tree health. The Forestry Commission's Biosecurity Programme Board is providing a strategic overview of the approach to plant health and biosecurity to ensure the delivery of work to exclude, detect and respond to existing and new pests and pathogens of trees, whether of native or exotic origin. Ongoing work in Scotland includes:

- determining and understanding the impacts of pests and diseases on forestry, trees, woodland and associated industries;
- preventing and managing outbreaks, and minimising their impact.

Climate change

There are many uncertainties associated with climate change, and its likely impact on trees, management systems and forest operations. A key basis for risk planning and management is diversification; from broadening the choice of genetic material, mixing tree species in stands, to varying management systems and the timing of operations. Scotland's aspiration to expand woodland from 17.8% to 25% of land area by the second half of the 21st century also provides an opportunity to target reforestation within habitat networks. This will reduce woodland fragmentation and thereby help improve the resilience of woodland ecosystems to climate change.

Forestry also has an important role in contributing to Scotland's ambitious climate change emissions reduction targets through carbon sequestration in our forests and wood products, and through displacing more carbon-intensive materials such as concrete and steel in construction and oil, coal and gas for heat and power production.

The independent report Combating Climate Change – A Role For UK Forests examines the potential of the UK's trees and woodlands to mitigate and adapt to our changing climate.

The opportunities for Scotland's forest to contribute to climate change mitigation through carbon sequestration and substitution are set out in Low Carbon Scotland - Meeting the Emissions Reduction Targets 2010-2022. These include:

- carbon sequestration from existing woodlands;
- carbon sequestration from new woodland creation – 10,000 ha per year;
- the Woodland Carbon Code – Developing well-governed forest-related carbon markets;
- **woodland Planning** – To avoid planting on carbon-rich soils and to ensure integration with other land uses;
- the UK Forestry Standard and Forests and Climate Change Guidelines;
- control of woodland removal;
- **wood for Construction** – Timber is a lower carbon alternative to construction materials such as concrete and steel;
- **wood for Fuel** – Wood fuel will be an important contributor to meeting the Scottish Government's target of achieving 11% of heat usage from renewable sources by 2020. Currently, over 90% of renewable heat is generated from woody biomass.

Large-scale biomass electricity

The Scottish Government's biomass policy seeks to avoid the detrimental impacts to the forest industries that might arise from overdevelopment of large-scale electricity-only biomass power stations in the UK. The Scottish Government has a preference for biomass being used in heat-only or combined heat and power schemes, off gas-grid, at a scale appropriate to make best use of both the available heat, and of local supply. Work is ongoing to deliver that policy.