

Woodland and Trees

Scotland used to be dominated by forests and woodlands. Through clearance for agriculture and demands for timber, by the early 20th century Scotland's tree cover was reduced to 5% of the total land cover. However, this figure is rising as the benefits of these habitats is explored and utilised.

Trees can increase the sustainability and resilience of agriculture. Often referred to as Agroforestry, integrating trees and woodlands on farmland provides many benefits to the farm.

Types of agroforestry



Ecosystem services supplied by woodland and trees

Provisioning	Cultural	Supporting
<ul style="list-style-type: none"> • Crops (and feed) • Livestock • Wild foods 	<ul style="list-style-type: none"> • Opportunities for recreation • Landscape and Aesthetic value • Cultural heritage 	<ul style="list-style-type: none"> • Nutrient cycling • Soil formation • Water cycling
Regulating		
<ul style="list-style-type: none"> • Local climate regulation • Carbon storage and sequestration • Flood control • Soil quality and erosion regulation 	<ul style="list-style-type: none"> • Water purification • Air purification • Pollination • Pest and disease regulation 	



Ecosystem service example – Soil quality and erosion regulation

Soil can be eroded by wind and water with around **2.2 million tonnes of topsoil eroded annually in the UK**. It is a growing concern in Scotland due to extreme weather events and compaction from heavy use machinery. Erosion depletes the soil of valuable nutrients and organic matter. **Read more about soil erosion, and why it matters from** [ClimateXChange](#).

Wind Erosion: Wind can erode topsoil, removing valuable soil nutrients, seeds and fertiliser. It has been found that well-placed trees **can reduce wind speeds by 30-50%**.

Water Erosion: Trees can increase water infiltration, slowing the flow and decreasing the volume and speed of surface water run-off. Research has shown that infiltration rates of surface water **are more than 60 x better** on land with trees than on adjacent land with no trees. A tree's canopy can also intercept rainfall, reducing splash soil erosion.

Soil Quality: Trees can deposit organic matter to the soil, an important aspect of topsoil creation. In addition, depending on species, trees can also improve soil fertility through nitrogen fixing.

Carbon sequestration: Trees, either stand alone or within a woodland, **sequester carbon** and can act as a carbon sink. Though there are times where net gain of carbon occurs (during tree planting) this is offset by the long-term ability of the trees to sequester carbon.

Read more on the benefits of different Agroforestry types in Scotland.



Woodlands & biodiversity

Risks to be aware of

If you have decided that tree establishment is the optimum choice for your land and biodiversity-

- Avoid establishing trees on habitats that are already rich in biodiversity, such as species rich grassland, peatlands, or wetlands. These habitats are already capturing carbon and providing habitats for plants, insects and mammals.
- Seek advice to identify areas where trees can deliver other ecosystem services, including recreational spaces, soil erosion mitigation, wildlife corridors and where they can provide shade for livestock and rivers.
- Select native species that are appropriate to site conditions. Unsuitable species may survive for the first few years but fail to thrive in years to come or may grow well but fail to regenerate. **Read more** about the potential for native woodland growth in Scotland and the 'Native Woodland Model'.
- Prioritise natural regeneration on existing wooded areas. Potentially cheaper and more efficient than tree planting, encouraging local species can increase the climate resilience of the woodland.
- Ensure herbivore grazing impacts are addressed for both domestic livestock and wild herbivores (deer, hare, rabbits etc.)

For more advice and information on tree planting contact the **Woodland Trust**.

Management actions to enhance

Control Invasive species

To help native woodlands thrive, invasive species such as **rhododendron** need to be controlled. Rhododendron can be detrimental to growth of other native species and needs to be controlled. Within Scotland, grey squirrel are decimating the native red squirrel population. They carry the squirrelpox virus and also out compete red squirrel for vital food and habitat. Find out if your land is in a **Saving Scotland's Red Squirrels priority area** and how to **help manage** them on your land to increase native biodiversity.

Manage grazing for species diversity

Grazing can ensure that a variety of species thrive within a woodland, however, over and under grazing can have negative impacts. When herbivores overgraze woodland, young tree saplings may not have the chance to grow, preventing natural regeneration. Ground flora will also be affected. Management can be implemented to ensure that woodlands are given space and time to develop. Ensure wild herbivore impacts are addressed in some woodlands, if they are entirely un-grazed, shrub and bracken growth can dominate, shading ground flora and leading to a decrease in biodiversity. **Find out more if grazing is right for your woodland.**



Assessing the condition of woodland and trees

The following factors should be considered when assessing woodland condition:

- Species composition
- Woodland type (plantation, semi-natural woodland etc.)
- Age class/vertical structure of the woodland (i.e. are there multiple layers, or is it uniform structure)
- Is there evidence of past management (thinning, coppicing etc.)
- Is there natural regeneration of trees
- Are there negative impacts such as wild herbivore pressure, livestock grazing or Invasive non-native plants

Read more on how to maximise biodiversity from your woodland in Nature Scot's Woodland Management Manual.