

HABITAT NETWORKS IN THE NATIONAL PARK

WOODLAND

INTRODUCTION

Trees and woodlands cover over 31% of Loch Lomond and The Trossachs National Park, of which a quarter is native woodland.

This is above the current woodland extent for Scotland of 18%, but well below the European Union's average of 38%.

Our native woodlands include rare temperate rainforests and the most southerly remnants of Scotland's ancient Caledonian pine forests. Protecting and enhancing the trees and woodlands of the National Park is of global importance for nature.

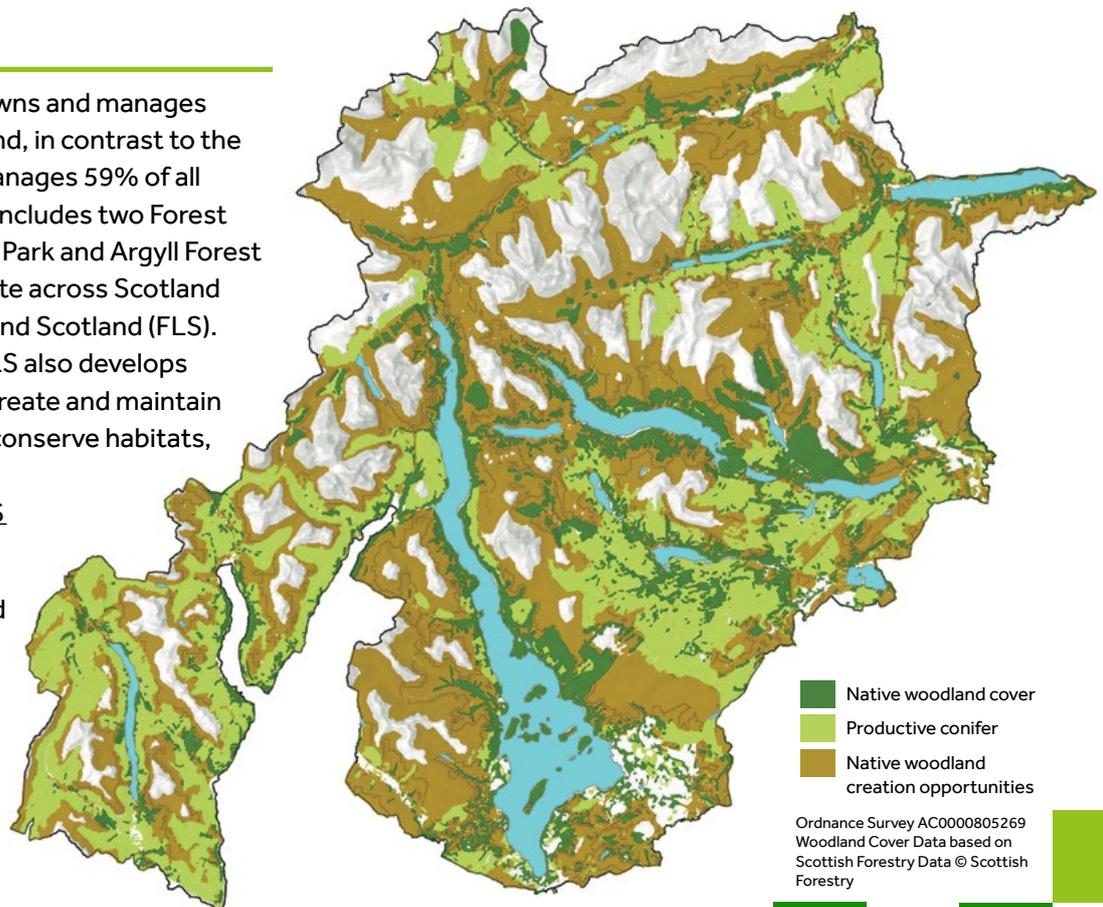
Not only can our trees help us to expand habitat networks and support biodiversity, they can also help us to mitigate more widely against climate change, contribute to the outstanding landscapes of the park and contribute to a thriving rural economy.



WOODLAND OWNERSHIP

The National Park Authority owns and manages only a few hectares of woodland, in contrast to the National Forest Estate who manages 59% of all woodland in the park and this includes two Forest Parks; Queen Elizabeth Forest Park and Argyll Forest Park. The National Forest Estate across Scotland is managed by Forestry and Land Scotland (FLS). As well as producing timber FLS also develops renewable energy schemes, create and maintain trails and visitor facilities and conserve habitats, wildlife and archaeological sites. [More information on FLS can be found here.](#)

The woodland in Loch Lomond & The Trossachs National Park which is not managed by FLS as part of the National Forest Estate is owned by organisations including RSPB, Woodland Trust Scotland as well as privately owned. It can be managed for a number of benefits including timber,



WHY ARE TREES AND WOODLANDS IMPORTANT IN LOCH LOMOND AND THE TROSSACHS NATIONAL PARK?

1. TACKLING THE CURRENT CLIMATE EMERGENCY

In 2019 the Scottish Government declared a global climate emergency and set out its ambition to become a 'Net Zero Nation' by 2045. The impacts of this climate emergency are already being felt in the National Park, affecting our landscapes, nature, communities and businesses. Trees and woodlands in the National Park play an important role in mitigating these effects by maintaining carbon stores and sequestering (storing) additional carbon. They can also help by minimising the impacts of climate change by reducing flooding, stabilising slopes prone to landslides and provide a sustainable source of fuel for renewable energy systems such as biomass boilers.

2. SUPPORTING THE NATURE CRISIS AND REVERSING BIODIVERSITY LOSS

The native woodlands in the National Park are of national importance for their rich biodiversity; supporting species such as red squirrels, black grouse, woodland birds, bryophytes (mosses and liverworts), fungi and insects. Creating new woodlands and managing existing woodlands ensures these ecosystems remain healthy and can contribute to national biodiversity targets to reduce nature loss in Scotland and the UK. A healthy, fully functioning woodland ecosystem is also much better at storing carbon and maintaining carbon already stored thereby also supporting the climate emergency.

3. SUSTAINABLE COMMUNITIES AND INCREASED RESILIENCE

Woodlands in Loch Lomond and The Trossachs National Park provide a source of employment. Productive conifer forests account for 62% of all woodland in the park, and employ people in the planning and processing of this industry, e.g. forest planning, planting, maintenance, thinning, harvesting, extraction of timber, haulage and sawmills. Woodlands are also important for local skills development and training. They provide business opportunities for local communities in areas such as tourism and recreation. Expanding woodland cover on farms and estates support additional income streams for rural businesses and provide shade and shelter for livestock. Finally, healthy woodlands help communities in the park to be more resilient (able to recover quickly) by helping to reduce the impacts of flooding and storm events.

4. HEALTH AND WELLBEING

The woodlands in the National Park are places which can be responsibly enjoyed by all. Many of the park's long distance routes, promoted cycle routes, community path networks and upland paths are located partly or wholly within woodlands. Wooded loch shores are popular places to camp or take part in quiet recreation such as fishing. The National Park also has two forest parks which are popular places for locals and visitors to enjoy recreational activities. Woodlands are also important for outdoor learning, volunteering and connecting with nature.

5. TIMBER PRODUCTS

Productive conifer woodland in the National Park covers approximately 34,000 ha (approximately 38,000 football pitches!) Conifer trees produce softwood, and this timber currently supplies sawmills which produce construction grade timber, particle board (e.g. chipboard), fencing, paper and biomass. Improving the quality of the timber by e.g. thinning woodlands (removal of trees earlier on in growing cycle to improve the quality of remaining trees) can increase productivity. Developing local markets for thinning and final products, such as biomass products would also reduce the costs of timber transport. Broadleaved trees produce hardwood, and the timber is used for products such as firewood and sawn timber for bespoke uses such as furniture building. Hardwood timber is a higher value than softwood but currently in the National Park there is only a very small market for this type of wood.

6. LANDSCAPES

The National Park's landscapes give rise to the area's outstanding scenery. From the wooded loch shores, ancient native woodland and wood pasture to the commercial forests and designed landscapes, there is huge variety of individual trees and woodlands which contribute to the park's special qualities. They provide texture and colour to the landscapes which change through the year. Woodland landscapes are part of the rich culture of the National Park and have inspired artists such as writers, painters and poets over centuries.

NATIVE WOODLAND IN THE NATIONAL PARK



Native woodland accounts for 23% of the woodland cover in Loch Lomond and The Trossachs National Park. This is according to the Native Woodland Survey of Scotland (NWSS) which was undertaken between 2006 and 2013. Native woodland creation in the National Park since 2013 has increased native woodland cover to around 24%.

The survey aimed to identify and map the location, extent, type and condition of all of Scotland's native woodlands. This included the woodlands in the National Park. This was important to enable a more accurate picture to be obtained of this important resource. Understanding more about the woodland and its condition enables more targeted conservation objectives to be decided.

WHAT IS NATIVE WOODLAND?

Native tree species are defined as those which have arrived in Scotland without human assistance as far as we can tell. The majority of our native tree and shrub species arrived after the last ice age approximately 9000 years ago. They arrived by a variety of means, including dispersal by wind, water and on animals and became established naturally.

Scotland's most common native trees include:

oak	rowan	birch	Scots pine	alder	willow	ash	aspen
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Common native shrubs are:

holly	juniper	hazel	hawthorn
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The definition of native woodland used by NWSS is 'woodland where more than half of the dominant species is made up by native species of trees'. ([Learn more about identifying trees here](#)).

According to the NWSS there are six main types of native woodlands:

1. Upland birchwoods, 2. native pinewoods, 3. wet woodland, 4. lowland mixed deciduous woodland, 5. upland oakwoods, 6. upland mixed ashwoods and other native woodland scrub.

The majority of these habitats are found in the National Park due to the diverse landscapes and conditions. Their distribution depends on environmental factors such as temperature, geology, soil type and aspect. (See above for more information on woodland cover of these native woodland types in the park).

Native Woodland

12,600 ha

23% of all woodland

Native Pinewood

1,100 ha

9% of all native woodland



Upland Oak

2,250 ha

18% of all native woodland



Upland Birch

4,000 ha

32% of all native woodland



Other native woodland types include:

upland ashwoods, wet woodland, lowland deciduous woodland and various scrub.

These figures were taken from the Native Woodland Survey of Scotland Survey Report – Loch Lomond and Trossachs National Park (2013).

KEY WOODLAND HABITATS IN THE NATIONAL PARK

A number of these woodland types have been given priority in the [Scottish Biodiversity List](#) as they are so important and may be at risk. The native woodlands in Loch Lomond & The Trossachs National Park represent a wide range of these, however, the following are of particular importance and priority for protection and expansion here in the park:

1. SCOTLAND'S RAINFOREST

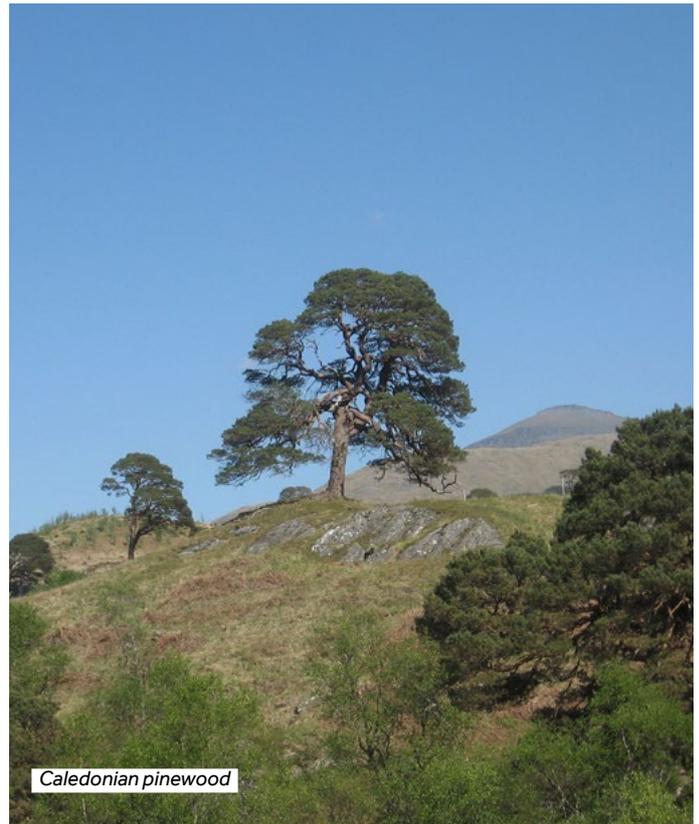
The high rainfall and oceanic climate of the west of the National Park is ideal for [Scotland's rainforest](#), with few frosts and a generally milder and more humid climate. These conditions are perfect for mosses, lichens and liverworts to flourish with oak woodlands as well as ash and hazel. Scotland's rainforests are a type of temperate rainforest. They support important species, often only found in these habitats, however, they face many threats such as invasive non-native species (INNS), diseases and browsing by domestic and wild mammals. For this reason it is important that management of existing woodlands and creation of new woodlands is given priority in the National Park. Many of the existing oak woodlands have been given special protection and designated for conservation due to their national or international importance. Creating new woodlands will also improve the connectivity of these habitats which allows species to disperse and migrate freely.



Temperate rainforest

2. CALEDONIAN PINEWOODS

These [woodlands](#) are the only native coniferous forests in Scotland and have declined over centuries due to factors such as grazing and burning. They occur on thin, infertile upland soils. They are mainly found in the east of Scotland where conditions are drier. There are two remnant areas of ancient native pine woodland in the National Park. It is unusual to find them in the west of Scotland where the conditions are wetter and warmer. These mainly consist of ancient 'Granny' pines with little or no regeneration, so their expansion and improved connectivity between the two areas is of high priority.



Caledonian pinewood

BIODIVERSITY OF WOODLANDS

A healthy woodland ecosystem is rich in biodiversity, supporting a large number of species of birds, mammals, insects, and plants, lower plants such as mosses and lichens and even bacteria! Different woodland types in the National Park will support a range of species all working together.

A healthy woodland will be made up of many components which include abiotic components (non-living physical and chemical components such as soil, water, and temperature) and biotic or living components including mammals, birds, plants, trees and fungi. A healthy woodland is made up of different layers including deadwood, leaf litter, a shrub layer and the canopy layer which is the mature trees. Key species of importance in woodland management and expansion in the National Park are:



1. BLACK GROUSE

Black grouse are a priority Biodiversity Action Plan species and are also on the red list of birds of conservation concern. They are a good indicator species of the health of upland habitats and are identified as a flagship species in the National Park Partnership Plan. Black grouse are found in many upland locations in the National Park, but mainly in low numbers.

In the Great Trossachs Forest NNR, appropriate woodland creation linked with open areas of ground has led to increased numbers of this iconic bird. It is important that areas of new woodland if appropriate are designed accordingly with low density open woodland linking with areas of open ground for nesting and rearing of chicks. Marking of deer fencing may also reduce fatalities in these areas.



2. BROWN TROUT

The native brown trout can be found in many of the watercourses in the National Park. As with the black grouse, they are a good indicator species of the health of aquatic ecosystems as they require clean and cold water to thrive. They are supported by well managed and designed riparian woodland (woodland at the edge of watercourses).

These woodlands will provide leaf litter and dead wood which increase insect numbers for food as well as places for the fish to shelter. Riparian woodlands also create shade which helps lower water temperature and trees also stabilise river banks, reducing sedimentation entering the water. Brown trout are also identified as a flagship species in the National Park Partnership Plan.

3. RED SQUIRRELS

Scotland supports an estimated 75% of the UK red squirrel population. Although one of the most popular mammal species in the country, they are facing a number of ecological challenges which have reduced their populations. In Loch Lomond and The Trossachs National Park they are widely distributed and are starting to colonise new areas such as the area around the south of Loch Lomond.

Red squirrels thrive in native woodland in the absence of grey squirrels, but also feed on the seeds of mature stands of productive conifers such as Norway spruce, Douglas fir and Scots pine. However, in stronghold red squirrel areas such as Glenbranter grey squirrel control and careful woodland management is required to prevent the non-native grey squirrel moving through Arrochar and Glen Croe into the strongholds.

In these areas, woodland planning is required which excludes large seeded broadleaved trees such as oak which is an attractive food source for the grey squirrel; and favours mature conifers which benefit reds ([see Case Study 2 Red squirrels for more information](#)).



4. WATER VOLES



The total UK population of water voles was reduced by approximately 90% between 1989 and 1996. Reasons for this decline are thought to be due to loss of habitat and predation by the non-native American mink.

The Trossachs Water Vole Reintroduction Project began in 2008 and has been an amazing success story. Surveys across Loch Lomond & The Trossachs National Park prior to this showed that water voles had been lost from most of the National Park. Forestry and Land Scotland, with help from partners, carried out a lot of work to restore wetlands and created habitats which were suitable for water voles in the Trossachs area of the National Park.

This work was part of a project to improve the habitat for wildlife in the Loch Ard Forest. Ponds were dug, tree-free buffer zones were created on river edges and riparian vegetation allowed to grow, and dams were built in ditches, all of which created good habitat for the water voles and other wildlife. Mink control was also undertaken to ensure the areas were as far as possible free from this invasive species. Water voles have continued to expand their population, now being found over 12 km from the original release sites ([see Case Study 4 for more information on Water voles](#)).

PRODUCTIVE WOODLAND IN THE NATIONAL PARK



WHAT IS PRODUCTIVE WOODLAND?

Diverse productive woodland accounts for 62% of all woodland in the National Park covering 34000 ha. The majority of these trees are non-native species including Sitka and Norway spruce, Douglas fir and larch. However, productive forests also include native woodland, open spaces and areas of wetland and can have high biodiversity value. Scots pine is the only native conifer species grown for timber in Scotland.

Timber production is vital to the economy of Scotland with forestry and timber processing accounting for £1.1 billion of Gross Value Added (GVA) every year. It also provides more than 34,000 jobs across the wood production, forest management, haulage and processing sectors ([Scottish Forestry website](#)). Timber production in the National Park helps support this processing industry and supplies mills producing timber used for construction, particle board, fencing, paper production and biomass. After crops are felled they are replanted, making this a sustainable industry.

Broadleaf trees produce hardwood which is a more expensive product than softwood and takes longer to grow. At present there is a limited market in the National Park for broadleaves (native and non-native) but there is potential for increasing these woodlands in the future with scope for local, bespoke markets.



THE IMPORTANCE OF INDIVIDUAL TREES IN THE NATIONAL PARK

As well as woodlands, individual trees or small groups of trees are also very important in the National Park. Visually they are part of the landscape and contribute to the special landscape qualities of an area. E.g. Wood pasture in Glen Finglas includes many individual trees. Many are of a considerable age and have a lot of cultural heritage associated with them going back over hundreds of years, so they tell amazing stories! Individual trees or groups of trees are also good for wildlife and they provide shelter particularly in exposed mountainous areas to wildlife and domestic livestock.

THE FOREST CYCLE

Well planned and managed forests are sustainable and rely on the forest cycle - plant, grow, fell, plant, grow, fell. The cycle includes:

PREPARATION

In some places the ground needs to be prepared before planting. E.g. mounds of earth are created to give trees the best chance of survival.

FELLING

Trees are cut down at 40 to 150 years of age - depending on the type of tree. Once felled, a timber lorry takes them from the forest roadside to the mill and they're turned into timber products.



PLANTING

Planting is usually done by hand. Trees are planted close together to give them protection from the wind and to encourage them to grow tall. Soil type, climate and site, can help decide which trees are planted.

THINNING

Smaller and poorer quality trees are removed throughout the life of the crop to favour growth of the larger and better quality trees which will eventually produce high quality timber

UK FORESTRY STANDARD

Any new woodland creation or woodland management proposals must comply with the UK Forestry Standards. This details all legislation and good practice and is the standard against which all new proposals are assessed. Factors which must be considered include how the proposals fit into the landscape, climate change impacts or mitigation, biodiversity, the historical environment, the effects on access.

Every proposal will be looked at in relation to these and more factors, and National Parks are considered within the standards as being of particular importance. Scottish Forestry are the government agency responsible for creating woodland policy and regulations. It also provides support including grants and advice for land managers wishing to better manage existing woodlands or create new woodlands.

Scottish Forestry also support communities, businesses and educational establishments and recognise the importance of forests and woodlands for health, learning and wellbeing. [More information on Scottish Forestry can be found here.](#)



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NATIONAL PARK STRATEGIC PLANS FOR TREES AND WOODLANDS

NATIONAL PARK PARTNERSHIP PLAN (2024-2029)

The National Park Partnership Plan guides the work of not just the National Park Authority but of all the organisations and other partners involved in managing the area and making the overarching vision a reality. The Plan sets out how we will work together to tackle key issues within the National Park and to widen the many social, environmental, cultural and economic benefits it offers.

The Partnership Plan has set a target rate of woodland expansion of 400ha per year.

NATIONAL PARK TREES AND WOODLAND STRATEGY



The National Park Trees and Woodland Strategy (2019-2039) is a long term plan which will help deliver the outcomes and objectives in the National Park Partnership Plan and Scotland’s Forestry Strategy (2019-2029). This includes the above target for woodland expansion in the park.

The vision for the National Park is for the trees and woodlands and forests to flourish and to expand, providing future generations with sustainable environmental, social and economic benefits from nature. The strategy explains how and where trees and woodlands will be protected, enhanced and used in the National Park and is a guide for all those involved in tree planting and management proposals in the National Park.

THERE ARE SEVEN STRATEGIC OBJECTIVES:

Increasing woodland cover for biodiversity and climate change mitigation	Improving existing woodland condition and diversifying woodland management	Protecting and enhancing the landscape	Maintaining and enhancing economic sustainability through forestry-related skills and business development
Promoting cooperative woodland management and creation as part of an integrated land management approach	Improving community empowerment and resilience through active engagement in woodland proposals	Encouraging and promoting public access to woodlands for recreation and improving people’s quality of life	

To achieve these objectives, the strategy contains more details on how this will happen including working with land managers; guidance on enhancing and protecting views and other important landscape qualities; guidance on expanding woodland habitat increasing species diversity and habitat networks; information on how woodland can work with existing land management such as agriculture and designated sites; it looks at opportunities to increase woodland skills and diversify timber products. Finally the strategy will promote access to woodlands for people to enjoy recreational activities and promote outdoor learning.

OUR FUTURE NATURE PROGRAMME AND KEY PRESSURES

What is the future for nature in our National Park? We face a global biodiversity crisis and even in our most special landscapes, nature as a whole is still in real trouble. If we do not halt and reverse this decline, then our world and all of us will have a poorer and more uncertain future.

Our Future Nature programme aims to deliver a positive, exciting vision of this National Park as an exemplar where people can understand, experience and contribute towards a shared vision for restoring nature.

Future Nature

FUTURE NATURE IS CONCENTRATING ON THE FOLLOWING KEY PRESSURES::

1. WATER QUALITY OF LOCHS & RIVERS



Careful management of new woodlands and active management of existing woodlands is important in ensuring that there are no negative impacts on water quality. Rhododendron leaf

litter is of poor quality and can be detrimental to water quality and reduce insect abundance in water courses (see INNS information below) and needs careful management. Woodland creation can help reduce flood risk by reducing water run-off and floodplain storage and new woodlands can help stabilise river banks. Riparian tree planting (planting along the water's edge) can help shade the water providing the optimum water temperature for fish species when planted appropriately. Leaf litter of native species will create habitat for insects, increasing their abundance for aquatic species such as fish. A great example of riparian tree planting and riverbank stabilisation can be found here. [Link to water habitat case study.](#)

2. INVASIVE, NON-NATIVE SPECIES [INNS]



The presence of *Rhododendron ponticum* in our woodlands can inhibit the growth of all vegetation growing beneath its canopy and eventually stop regeneration of native trees

and shrubs. Control of this species requires collaborating with both Forest & Land Scotland and other landowners and partners across the National Park and prioritising areas for control. Engaging with communities is also really important in tackling this species so our woodlands can thrive. [Link to INNS case study.](#)

3. HERBIVORE PRESSURE



On our moorlands and in our woodlands, domesticated and wild herbivores, including sheep, cattle, deer and feral goats are widespread. As well as being central to the land management economy, they are also part of the National Park's cultural and natural heritage.

Unsustainable levels of wild and domesticated grazing animals in upland and woodland areas can however lead to loss of species in the ground flora, simplified woodland structure without shrubs or climbing species, reduced tree cover and the erosion of soils, which are important carbon stores. Within the National Park there are 5,787 ha (NWSS 2014) of native woodland of which 5,063 ha has some herbivore impacts recorded.

The National Park work closely with land managers, deer management groups and partner organisations to monitor the impacts of herbivores. They provide support and training so information can then guide management decisions to ensure that impacts are 'low' or 'medium' when herbivore impact assessments are carried out. This management may include maintaining lower grazing densities, increased deer control or fencing of new woodlands. [For more information on deer in the National Park](#)

4. CLIMATE CHANGE

Climate change is already affecting the woodland ecosystems in the National Park and it is important that woodlands are resilient to these changes. The warmer, wetter weather we have been experiencing has led to the spread of existing and new pests and diseases which affect tree health. *Chalara* ash dieback is now established and now needs to be carefully managed. Larch is no longer recommended for planting as a productive species due to *Phytophthora ramorum*. Reporting of these diseases as well as education to reduce their spread is important, and citizen science plays a key role.

Wild fires are also an increased threat to woodlands with warmer weather predictions, and management of woodlands needs to consider this. Woodland creation and restructuring need to think carefully about species choice, and where the seeds of the trees to be planted originate from (provenance).



MITIGATING AGAINST CLIMATE CHANGE



The growing impacts of the climate emergency have been all too real to those living, working and visiting the National Park. There have been more frequent

flooding and landslips, seriously damaging people's homes, communities and businesses. Our warmer and wetter climate also threatens nature, where ecosystems, once stable and able to support many species, are struggling to adapt to these quickly snowballing changes. It's clear that doing nothing is not an option: we must act now. Nature-based solutions are at the core of tackling the climate emergency and our focus will be working with partners, rural businesses and communities to better adapt to, and mitigate the impacts of climate change.

The woodlands in the National Park already hold 2.5 million tonnes of carbon. Supporting new sensitively sited woodland expansion projects will not only help mitigate against climate change, but also help reduce the impacts of flooding, increase water quality and help reduce the severity of landslides.

Improved management of existing woodlands by for example reducing herbivore grazing impacts and removal of invasive non-native species, will also increase the ability of the trees to absorb and store this carbon.

Well managed native and productive woodlands will improve soil function and reduce carbon loss. Productive woodlands can provide timber products which are alternatives for building materials such as concrete and steel providing a sustainable material which can also reduce the carbon footprint of a development. Delivering the Trees and Woodland Strategy will be key in these nature-based solutions along with peatland restoration and habitat enhancements. This work will also bring benefits to nature, help reverse nature loss and provide training and employment opportunities to help our green recovery.

GET INVOLVED!

- [National Park Tree Planting Grant Scheme encourages tree planting in the National Park](#)
- [Why not volunteer, become a Junior Ranger or join our Youth Committee to make a real difference!](#)



QUESTIONS AND PUPIL ENQUIRY

- Why are trees so important in our fight against climate change?
- What is the definition of a native woodland and can you name an example of a type of native woodland in the National Park?
- Why do new woodland proposals need to be planned and what are the guidelines called which must be followed?
- What are the main threats to trees and woodlands in the National Park?
- How much carbon do trees store?
- How can we make our woodlands more resilient to climate change?
- What is the target for woodland expansion in Loch Lomond & The Trossachs National Park and what is the plan called which will guide how this happens?

FURTHER READING



Online

- [Read more about Future Nature in our National Park's Future Nature Route Map](#)
- [Loch Lomond and The Trossachs National Park Trees and Woodlands Strategy 2019-2039](#)
- [The Native Woodland Survey of Scotland \(NWSS\)](#)
- [Learn more about productive forestry with Forestry and Land Scotland](#)
- [Lots of information and resources about trees and woodlands with Outdoor Woodland Learning \(OWL\) Scotland](#)
- [Forestry and Land Scotland – Learn about the history of our woodlands](#)
- [Alliance for Scotland's Rainforest](#)
- [Which pests and diseases are threatening trees in Scotland](#)
- [Learn more about tree species and how to identify them](#)
- [Species of concern in The Species Action Framework Handbook](#)
- [Learn about the Great Trossachs Forest National Nature Reserve one of the largest NNRs in the UK and a landscape scale woodland restoration project](#)



Video clips

[Learn more about Scotland's native woodlands - Scottish Forestry – Scotland's Native Woodlands](#)

[Why forests are important for people -Confor – Our forests, our people](#)



Site visits

- Visit [The Lodge Forest Visitor Centre](#) in Aberfoyle. The Lodge and surrounding woodland is owned and managed by FLS. A great place to see red squirrels and learn more about trees and woodland management in the visitor centre.
- [Inchcailloch](#) is a small island in Loch Lomond. It is part of the Loch Lomond National Nature Reserve, and is an amazing place to see an area of Scotland's rainforest.
- [Cormonachan Woodland](#) is a community woodland on the shore of Loch Goil. Another area of Scotland's rainforest and now managed for wildlife and people.
- [Glen Finglas Estate](#) is part of the Great Trossachs Forest NNR and is managed by the Woodland Trust.
- [Argyll Forest Park](#) and [Queen Elizabeth Forest Park](#) are both great places to visit.