

# Scotland's 'ice age' pinewoods on knife-edge, says first major study in 60 years

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Most of Scotland's globally-unique Caledonian pinewoods are on a 'knife-edge' and could become the last generation in a line stretching back to the last ice age, says the first major study into their health for over 60 years.

A four-year analysis by Trees for Life found that high deer numbers, spread of non-native conifers, lack of long-term management, and emerging impacts of climate breakdown are major threats to the pinewoods' survival.

The woodlands form a rich habitat found nowhere else in the world, and some are thousands of years old. They are home to declining wildlife such as red squirrels, capercaillie and crossbills.

Urgent action needs to include dedicated and easily accessible long-term funding, so private landowners can save and restore their pinewoods and look after them in the future, says Trees for Life.

The rewilding charity is also calling for full implementation of proposed national measures to reduce deer numbers, as well as action to allow the pinewoods to expand into cooler areas – such as higher up mountains – in response to climate change.

"Our findings are an alarm bell for Scotland's Caledonian pinewoods, which are such an important part of the country's culture and environment. The majority of the surviving fragments are now on a knife-edge, and bold action is needed to save them from being lost forever," said Steve Micklewright, Trees for Life's Chief Executive.

"A landscape-scale approach backed by the Scottish Government is urgently needed to save, expand and connect up these precious woodlands before it is too late."

Only some 42,000 acres of the original pinewoods survive. Over the past four years, Trees for Life assessed the state of 72 of the remaining 84 fragments, which are scattered across the Highlands from Loch Lomond, northwards to near Ullapool, and eastwards to Glen Ferrick near Aberdeen.

In one of the most comprehensive surveys of the pinewoods ever undertaken, the team carried out detailed studies of more than 1,200 half-acre plots in total across the sites.

Scotland's national tree, the Scots pine, was found to be in serious decline at a quarter of the plots.

Deer are having serious impacts in around two-thirds of the plots, by eating pine saplings, stripping important vegetation, and causing some pinewoods to be replaced by birch. High impacts from artificially large deer populations are the main barrier to the pinewoods' recovery.

Non-native conifers, originally planted in the 1950s, are still present in a third of the plots. Mainly Sitka spruce, these crowd-out and slowly kill Scots pine – a risk which increases year-on-year, with mature conifers an acute threat to Scots pine and other native trees.

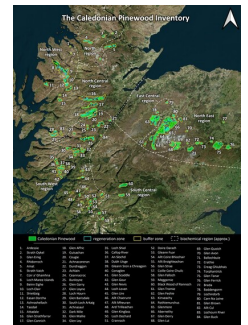
"In the worst cases, the pinewoods have suffered non-native conifer planting or fire followed by grazing pressure, with the impacts of climate breakdown a growing threat," said Trees for Life's Senior Ecologist James Rainey, who led the study.

"These pinewoods should be playing a key role in Scotland's fight-back against the climate and nature emergencies, but right now most are on their last legs. It's not too late to turn this around, but that means seriously stepping-up restoration and rewilding action."

Partner organisations in the project were Forestry and Land Scotland, NatureScot, Scottish Forestry, Scottish Land & Estates, and Woodland Trust Scotland.

The study found that despite significant efforts made by conservation groups and public authorities in the 1990s, work to protect pinewoods with deer fencing work badly – usually because only small areas are fenced off, leaving larger areas unprotected from grazing. Deer also often breach fences during the 30 years that pinewoods need to establish themselves.

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Just 11% of the 84 remaining sites are over 500 hectares in size, meaning many surviving pinewoods are now small and isolated. This reduces biodiversity, while making it harder for the pinewoods to regenerate and weakening their resilience in the face of climate breakdown.

The minority of pinewoods that are recovering well – such as in Glen Affric and around Glenfeshie and Mar Lodge – are in areas benefitting from landscape-scale action, including reduction of deer pressure and removal of non-native conifers.

The study's findings will be used by Trees for Life to develop a follow-up project with landowners and land managers for practical action to protect, expand and reconnect the most threatened pinewoods. Additional conservation is already underway at 12 sites.

The Caledonian Forest once covered much of the Highlands, but following centuries of deforestation just some 2% of the forest remains.

Trees for Life's Caledonian Pinewood Recovery Project is the first major study of its kind since 'The Native Pinewoods of Scotland' by HM Steven and A Carlisle was published in 1959. Work by the then Forestry Commission Scotland in the 1990s mapped the sites in a Caledonian Pinewood Inventory, but this did not comprehensively assess the health of the pinewoods.

The new report, 'Caledonian Pinewoods: Findings from the Caledonian Pinewood Recovery Project', is available at [treesforlife.org.uk](https://treesforlife.org.uk).

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