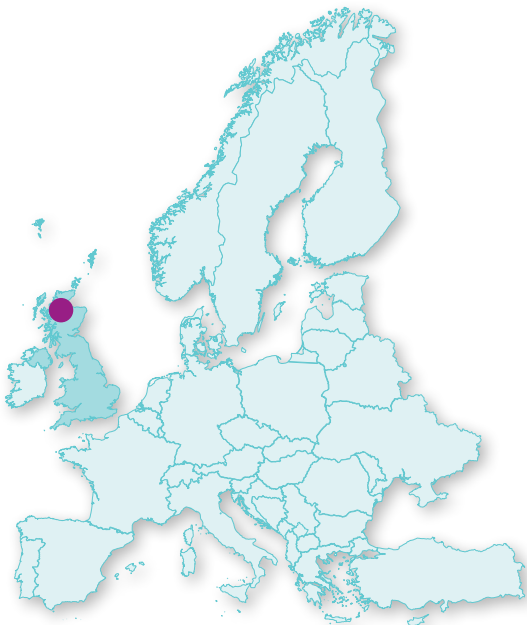


The regeneration game



JAMES SHOOTER



In the Affric Highlands of Scotland, efforts to protect and restore woodland are supporting natural regeneration and the realisation of a wilder, more biodiverse landscape.


Pinewoods under pressure

The Caledonian Forest – the ancient old-growth forest of Scotland – is one of the country’s richest habitats. A globally unique ecosystem, it is characterised by wild Scots pines, complemented by species such as juniper, birch, willow, rowan and aspen, all of which have naturally evolved together over thousands of years. It provides a home for a wide variety of rare and adapted wildlife, including pine martens, capercaillie, and Scottish wildcats, conifer specialists such as crossbills and red squirrels, as well as butterflies, lichens, fungi, and wildflowers.

At its peak, the Caledonian Forest covered most of the Scottish Highlands, but historic climate change, together

with forest clearance for agriculture, led to widespread decline. Today, less than 2% remains, with 84 pinewood fragments scattered across a largely treeless landscape. Many of these are in danger of disappearing forever, taking their precious genetic diversity with them.

“A major pressure on these small fragments is the unnaturally high level of deer browsing, which prevents new generations of pines from establishing,” explains James Rainey, an ecologist with Trees for Life, Rewilding Europe’s partner in the Affric Highlands. “This means mature ‘granny’ pines get older and naturally die without a new generation of trees being able to establish and to grow in their place.”

- **Country**
 Scotland
- **Focal landscape**
 Affric Highlands
- **Size of landscape**
 218,315 ha
- **Work started in**
 2021
- **Larger landscape**
 Scottish Highlands west of Loch Ness, from Glen Affric in the east to Glen Shiel in the west.
- **Main habitats**
 Caledonian forests, peatlands, grasslands, rivers, lakes and mountain hillsides.
- **Focal species**
 Red deer, roe deer, Scottish wildcat, red squirrel, pine marten, Atlantic salmon, Eurasian lynx, Tauros.
- **Team Leader**
 Stephanie Kiel



Towards natural regeneration

In 2023, efforts to recover nature in the Affric Highlands primarily focused on woodland and riparian restoration. These were guided by a wild tree survey, which the local rewilding team began in late 2022, with a focus on the various estates across the Affric Highlands landscape.

The ongoing survey, which is largely based on fieldwork, looks at the distribution, health, and diversity of native tree species on each estate. This includes factors such as age and abundance, the level of grazing pressure, and the direction woodland and forest fragments are moving in terms of expansion or decline.

“The overall aim is to identify where the remaining diversity hotspots are and which are the most severely threatened,” explains James Rainey. “This allows us to allocate resources for maximum impact, in terms of protection and restoration. We want to ensure as many trees as possible are protected

– in larger woodlands and along rivers and gorges where trees are clinging on in places where deer can’t reach them – so that natural regeneration can take place.”

Such regeneration can support the recovery of wildlife species such as capercaillie and Scottish wildcat, boost genetic diversity, and increase the resilience of trees to variables such as climate change. It also ensures the right tree grows in the right place, helping to create a mosaic of habitats that store and sequester carbon.

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23

hectares of riparian restoration carried out on Corrimony Farm in 2023.

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A precious remnant

The regeneration of Scotland’s native pinewoods took a small but important step forward in late 2023 with the protection of a forest remnant in Glen Loyne, located at the western end of the Affric Highlands rewilding landscape. Situated on the East Glenquoich Estate, the ancient woodland currently contains 57 pines, including Scotland’s oldest wild Scots pine, thought to be at least 566 years old. The ancestry of such pines stretches back to the last ice age, which ended about 10,000 years ago.

“We assessed the protection of the pines at Glen Loyne as extremely high priority due to the ongoing decline at the site,” says James Rainey. “Old maps and documents suggest there were a couple of extensive pinewoods here in the 1700s, but by the 1990s there were less than 90 trees left. Photos from that time show thousands of pine stumps and a handful of survivors – it was like a pine graveyard.”



- ◀ A river in the Affric Highlands runs through a heather landscape.
- ▶ A Tamworth pig at Bamff Wildland.
- ▶▶ Black grouse.
- ▶▶▶ Pine marten.

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“Scientific data shows rivers across the Highlands are warming up rapidly as a result of climate change.... Riparian restoration can help to minimise future temperature increases.”

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In cooperation with the owner of East Glenquoich, and with funding provided by the family of Harry Steven, who co-wrote “The Native Pinewoods of Scotland” in the 1950s, Trees for Life oversaw construction of a new, deer-proof fencing “exclosure” around as many of Glen Loyne’s unprotected pines as possible. In balanced, healthy ecosystems, the presence of predators helps to keep herbivore numbers at sustainable levels. Many large estates in the Scottish Highlands have long managed their land specifically to encourage high deer numbers for sport shooting. In addition, habitat loss and persecution led to the disappearance of wolves in Scotland by the late 1600s, which means deer now have no natural predators.

By keeping deer out, the new fencing at Glen Loyne will allow young seedlings to grow without being eaten - something that hasn’t happened for decades. A second phase of fencing may happen in 2024, although many of the remaining unprotected trees are located on crags and steep slopes, which makes fence construction a challenging proposition.

“We fully recognise that fencing is a short-term, quick-fix solution,” says James Rainey. “Ideally, we’d like to see more landscape-scale deer management in the Affric Highlands area, which would really help natural regeneration

to take off. This is what we’re working towards, but it’s a long-term process.”

Since red deer counts began in the 1960s, official estimates suggest that the Scottish population has roughly trebled from 150,000 to between 360,000 and 400,000, which means Scotland is home to almost 30% of the entire European population. The current average density of red deer on open hills across the Scottish Highlands is estimated to be around 10 per square kilometre. For natural regeneration to take place, this figure needs to be halved. And for the full range of native trees species to regenerate, it needs to be as low as 2 to 3 per square kilometre, as deer will feed on specific tree species first if they have a choice.

Riparian restoration

Re-establishing natural processes and restoring the functionality of woodland along rivers across the Affric Highlands, especially at higher elevations where tree cover is particularly sparse, is another pressing issue.

“Scientific data shows rivers across the Highlands are warming up rapidly as a result of climate change,” explains Paul Greaves, the Affric Highlands rewilding team’s riparian officer. “Without the shading provided by trees, this is threatening cold water-adapted aquatic species, which includes everything from Atlantic salmon and brown trout to freshwater pearl mussels and aquatic invertebrates. Riparian restoration can help to minimise future temperature increases.”

Funded by a Scottish Power Foundation grant and a donation from Startline Motor Finance, the Affric Highlands rewilding team restored 23 hectares of riparian woodland on the 4000-hectare Corrimony Farm in the autumn of 2023. Working inside deer-proof fencing, a

566

The oldest pine at Glen Loyne is at least 566 years old.



group of volunteers planted a range of native tree species, including downy birch, several types of willow, rowan, juniper, aspen, and bird cherry along small tributaries of the River Enrick, at an elevation of between 400 and 550 metres. Many of these species are very palatable to deer and are now rarely found in the Scottish Highland landscape.

“The ideal scenario would be to support the regeneration of existing woodland remnants, where the diversity is high, but this is very difficult if there isn’t an adequate seed source,” explains Paul Greaves. “For this reason, we planted saplings from nearby nurseries to keep the provenance as local as possible.”

If and when grazing pressure from deer is reduced, the restored woodland at Corrimony will enable further recolonisation of the landscape.

“We would expect to see further expansion of trees downriver, as seeds are transported on the current and become established in nutrient-rich riverside soils,” says Paul Greaves.

Stakeholder engagement

The Affric Highlands rewilding team have established good relations with David and Barbara Girvan, the owners of the Corrimony Farm. The idea of restoring riparian woodland on their land came about following conversations that took place through the

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 “We fully recognise that fencing is a short-term, quick-fix solution...”

Glen Urquhart Farming Cluster, which the team established in early 2023 to support farming enterprise within the Affric Highlands, and to help make sustainable, locally produced food easily accessible for communities.

“Moving forwards we want to scale up riparian restoration, ideally through landscape-scale interventions,” says Paul Greaves. “Ultimately it depends on what the landowner wants to take forward, and then we can look to secure funding. There’s no financial disincentive for

landowners, while on the flip side there is a possibility to generate revenue in the future through the sale of nature-based credits, such as carbon credits.”

“The Affric Highlands team have been great to work with, especially the people on the ground,” says David Girvan. “It’s been great to get more trees along the river and I’m keen to see how they develop. I’d be open to more restoration in the future, and I hope the work carried out at Corrimony leads to similar initiatives on other estates.”

