PEATLAND MANAGEMENT
FORESTRY

Introduction

For centuries, Irish peatlands have been utilised and managed for a wide range of uses. Historically, these included light grazing (by livestock) and extraction of peat for heating (by hand) but, more recently, peatlands have been subject to extensive use for forestry, grassland and peat extraction, as well as for infrastructure (wind farms).

Irish peatlands are naturally **tree-less** due to climate and peat soil development. **Afforested peatlands** cover approximately **458,900 ha** of peat soils in Ireland (NIR, 2023). In an effort to increase the forest cover in Ireland, considerable areas of peatlands, especially blanket bogs, were afforested by the State over the second half of the 20th century, which changed the Irish landscape introducing **coniferous** species, such as Sitka spruce, lodgepole pine and Norway spruce (723). Afforestation of peatlands declined at the start of the 21st century (59).

Policy and nature conservation initiatives are now paving the way to restore blanket bogs previously afforested or re-designing peatland forests. However, management practices and planning hurdles require more robust stakeholder consultation and scientific monitoring.

Afforested blanket bog in Co. Donegal with multi-age conifer plantations.

Key Research Findings

- While the majority of the national forest estate is found on peat soils, the status of peatland forestry in Ireland remains marginal and its **national economic significance has yet to be fully evaluated** (723).

- Findings have shown that **plantation forestry can have a profound impact on the water quality** of small peatland lakes, especially at the clearfell stage (245). Lakes with afforested catchments display high concentrations of plant nutrients, dissolved organic carbon and heavy metals; the highest concentrations recorded from clearfelled lakes (244).

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Key Research Findings (continued)

- **Significant effects of clearfelling** of a 39-year-old lodgepole pine and Sitka spruce forestry in an upland peat catchment have been shown **on water temperature, flows, dissolved oxygen and stream metabolic (photosynthesis, respiration) rates** (645). Clearfelling of forests has been shown to **lead to increased dissolved reactive phosphorus**, likely caused by leaching from degrading brash mats (293, 646, 749).
- **Mitigation practices employed on clear-felled forest site are not effective** in phosphorus retention (294). Using grass seeding and mini-buffer practices to immobilise nitrogen on-site could effectively reduce phosphorus and nitrogen runoff from harvested peatland forests, protecting nearby watercourses and their associated species, such as **salmonids and freshwater pearl mussel** (17, 647).
- Inorganic fertilisers applied at the start of the forest cycle, decay of the underlying peat soil, accumulated surface tree litter and leachate from felled trees are likely sources of elevated concentrations of plant nutrients, dissolved organic carbon, heavy metals and major ions, with **excessive peat soil disturbance during clearfelling likely exacerbating runoff into lakes** (245).
- **Fluctuations in the water table also affect greenhouse gas emissions** as **clearfelling** of the forest produces significant increases in carbon dioxide and methane emissions, but a decrease in nitrous oxide emissions (295).
- **Ammonium-nitrogen concentrations in drains increase with clearfelling**, and temporarily decrease in larger streams, while nitrate increases in some cases (191).

Clearfelling of conifer plantation on blanket bog, Co. Mayo.

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How can we ensure that forestry management actions are incorporated into the sustainable management of Irish peatlands?

- Afforestation and re-afforestation of peat soils has been shown to be highly problematic for a range of environmental reasons and should be phased out. Afforestation of degraded peatlands is not beneficial, except in specific cases where rewetting is not technically feasible.
- A code of good practices for the sustainable management of forested peatlands should be produced and applied systematically to those in state-ownership. The Forestry Code of Best Practice (CoBP) should be constantly updated with new knowledge gathered from forested peatlands (drained and rewetted) and explicitly contain practices to support SPM.
- Rewetting and restoring of previously afforested bogs, as well as support for continuous cover forestry and replanting with native species, require strong policy backing and industry commitments.

Grass seeding of peatland immediately after harvesting as a nutrient (Phosphorus) buffer.

Photo: Connie O'Driscoll

Database

This factsheet is part of a series produced by Peat Hub Ireland (PHI). The reference numbers in brackets refer to individual publications in the PHI database which link to the original source of evidence. Use the QR codes to access the database or view research projects associated with the themes. All factsheets in the series are available on the PHI website.

Research Projects