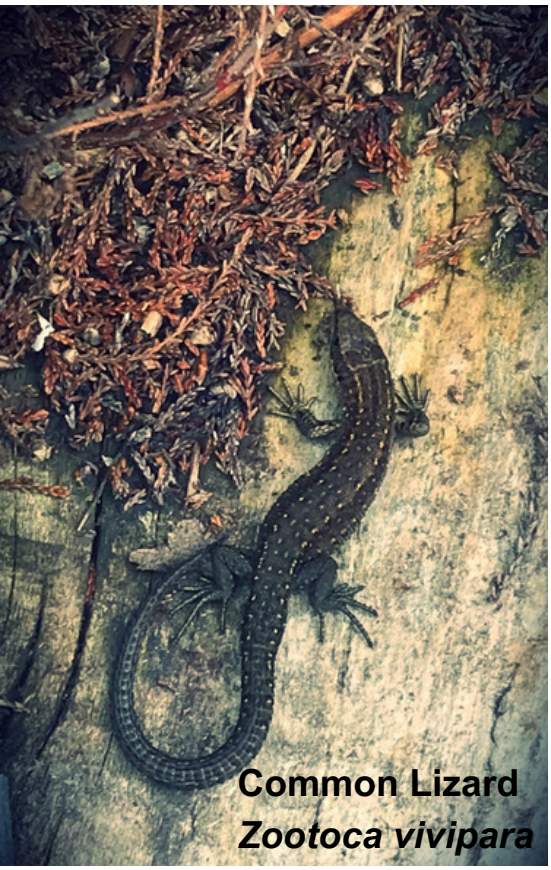


Common Lizard
Zootoca vivipara

Peatlands are exceptional natural entities. They can form a variety of landscapes that contain a range of ecosystems along with their unique biodiversity i.e. the variety and variability of living species including plants, animals, bacteria, fungi and genetic material, as well as the humans!

Sundew - carnivorous bog plant

PEATLANDS AND BIODIVERSITY

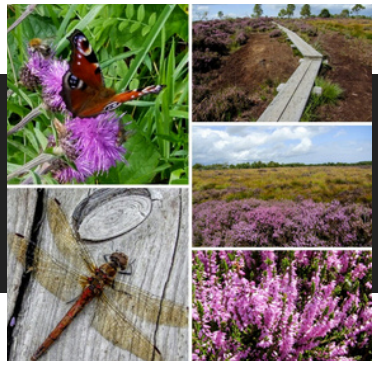
Introduction

Peatland biodiversity is relatively unexplored with many rare species yet to be discovered. Peatlands are refugia of rare and threatened species (e.g. bog orchid) that are in sharp decline not only in Ireland but on a global scale. Many peatland species are threatened by unsustainable human activities worldwide and in Ireland.

The ecosystem services (provisioning, regulating and cultural and supporting services) provided by natural peatlands ultimately depend on living organisms. Biodiversity is directly responsible for creating the diversity of landscape and habitats, as well as the variety of peat types.

This biodiversity helps underpin a sustainable rural community, as well as providing services for society: water filtering and supply, foods such as berries and mushrooms, eco-tourism and other socio-cultural benefits, as well as potential future medicines from molecules identified in bog plants that help fight disease.

To reverse biodiversity loss, it is essential to protect, effectively manage, and restore peatlands. This is vital not only for the biodiversity that they support as refugia, but also for their role as habitat connectors and their contribution to global climatic and hydrological processes.



Trends

Very bad on all fronts - habitats, birds, invertebrates

Despite the network of protected areas (Special Areas of Conservation (SAC) and Special Protected Areas (SPA)), activities such as peat cutting and drainage continue to impact peatland habitats (876, 875). In 2017, over 37% of our active raised bogs were recorded as lost from the SAC network (1000). There are more green parks in Dublin city than there are 'actively growing' raised bog left in Ireland (1639 ha) (1000). Latest research reveals that the curlew's rapid decline has persisted since the 1980s, highlighting the urgent need for action to prevent its disappearance from the Irish landscape.

Newt in Sphagnum moss

Source: Simon Gray

Preservation of remaining natural peatlands and prompt rewetting of degrading peatlands should remain an urgent focus where possible to protect threatened species (and even recover species from the brink of extinction), as well as provide a healthy biodiversity to support people and the planet.

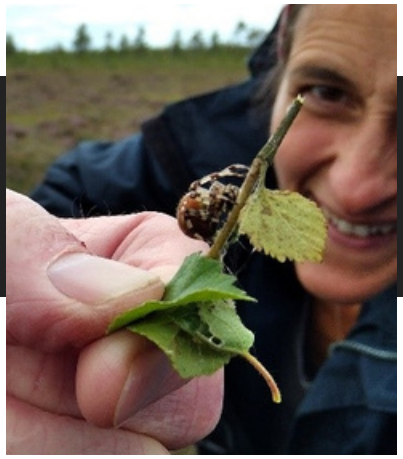
Eriophorum angustifolium
Common bog cotton

PEATLANDS AND BIODIVERSITY

Key Research Findings

There are few true peatland species. This is because they have remarkably evolved to adapt to the harsh environmental conditions of peatlands: wet (high water table, high moisture content), low oxygen content, acidic conditions, limited availability of nutrient and wind-swept environments (733).

Typically, natural peatlands do not host the most biodiversity in terms of number of species, but they are highly specialised species that cannot compete in other ecosystems, such as grasslands and forests, and so are doomed if their habitat conditions changes (e.g. due to drainage) (732).



Orb-weaver spider
(*Araneus quadratus*)

Lichens (*Cladonia spp.*) found on bogs have pharmacological significance

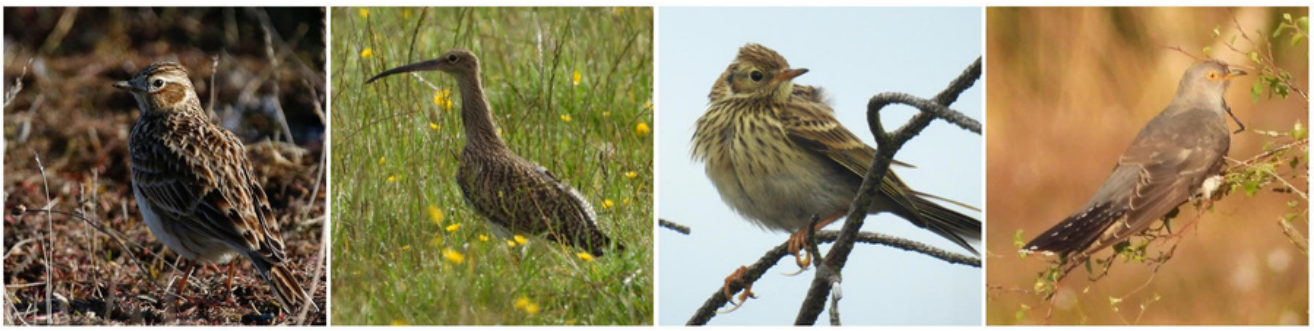
Peatland vegetation is dominated by a few groups of plants, two of which are significant for the functioning of the ecosystem: 1) Sphagnum mosses, which are excellent ‘peat builders’ as well as ‘home builders’ as they form typical micro-habitats (carpets, lawns, hummocks that make the bog looks ‘undulated’ and allow other plants to grow); and 2) Sedges (the most commonly known are cotton grasses, which are, in fact, not grasses).

The main types of peat you will find in Irish peatlands are Sphagnum or Sedge peats, but there are other types depending on the dominant vegetation at the time (e.g. bog bean peat and woody peat, with actual remains of wood from an era where the bog was drier and trees could grow), and you can encounter them all within the same profile. From its peat and the remains of the vegetation and other artefacts, each bog tells a different story of that particular place (732, 733).

PEATLANDS AND BIODIVERSITY

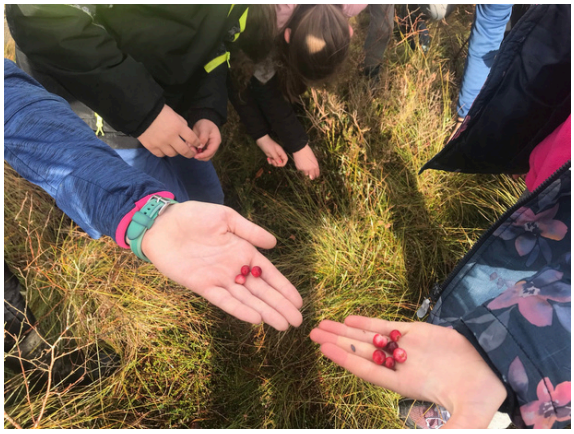
Key Research Findings (continued)

- **All peatland habitats (raised bogs, blanket bogs and fens) are protected** under the 1992 Habitats Directive with Active Raised Bog a priority habitat, i.e. exceptionally rare in Europe. Despite the network of protected areas, activities such as peat cutting and drainage continue to impact peatland habitats (875, 876). Over 37% of active raised bogs were recorded as lost from the SAC network (1000).
- **All peatland types are crucial habitats for a variety of birds, including Hen Harrier and Grey Partridge** (534, 535, 78). However, peatlands that suffered burning events now lack key bird species (717). Several areas with large expanses of blanket bog have been designated as SPA with a view to conserve the following breeding species: Merlin, Golden Plover and Dunlin, all of which are listed on Annex I of the EU Birds Directive (1009, 1012).
- Despite the relatively low avian species diversity of **Irish peatlands,** they are of **enormous conservation value** due to the **presence of species of high conservation concern, such as Willow Ptarmigan, Red Grouse and Eurasian Curlew** (59). In addition, Irish peatlands support high densities of open habitat specialists, such as Meadow Pipit and Skylark (636).
- The number of **invertebrate species in peatlands** is typically low but communities differ between the peatland types, with several species recorded from only one type of peatland (312, 608, 930). Species extinct elsewhere are found in protected Irish fens (12).
- **New records of species found in bogs and fens show their role as a biodiversity refuge** in extending the known range of species (229,282,603). This includes degraded undesignated bog remnants or lagg zones of cutover bog. These habitats are of significant conversation value for certain species (306, 607).
- Ascomycetes are the largest group fo fungi in peatlands with *Penicillium* the most species-rich genera; the majority are involved in the decomposition of organic matter (844).
- **Microbiota diversity is not well studied in Ireland** but differences in microbial assemblages have been recorded between peatland types (213). Overall diversity levels suggest that there is more genetic variation present than had previously been assumed, i.e. genetic diversity varies between plant species in different bog locations; this is also true for bryophytes (923, 928).
- **An array of molecules are still being discovered in plants found on Irish bogs**, which vary depending on the bog location. These findings could support next generation treatments and correlate with traditional use of these plants (136, 323, 595, 597, 682, 776).



Skylark (Gary Hill); Curlew (Owen Murphy); Meadow Pipit (Liam Mulligan); Cuckoo (Timothy Sullivan)

Blanket bog landscape, Errigal, Co. Donegal



Cranberries are an important food source for many birds and animals of the bog

PEATLANDS AND BIODIVERSITY

How can we effectively address the global biodiversity crisis through the sustainable management of Irish peatlands?

- Preservation of remaining near-natural peatlands and prompt rewetting of degraded peatlands should remain an urgent focus where possible to protect threatened species, recover species from the brink of extinction, and provide a healthy biodiversity to support people and the planet.
- The challenge lies in managing these high nature value landscapes through agri-environment schemes that enhance biodiversity by maintaining structural heterogeneity across various scales, altitudes and habitats, while also incorporating the decisions of the people living and working in these marginal areas.
- Local biodiversity action plans represent a perfect local scale opportunity to renew our focus on peatlands biodiversity, in terms of protection and restoration.
- Care should be taken that development does not cause further fragmentation of peatland habitats.
- At the national level and within the legislation framework, small peatlands, degraded sites or areas just outside existing protected bogs would merit designation if we are concerned with biodiversity, not only species, but landscapes and the diversity of human experience.

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