

Report series:

Impacts of pressures on water quality

DRAINED PEAT



Catchment Science & Management Unit

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Preface

This document is part of a report series that summarises the evidence on each of the main significant pressures that impact on water quality. The series currently includes reports on the following key pressures:

- Agriculture
- Urban waste water
- Hydromorphology
- Forestry
- Domestic waste water
- Industry
- Drained peat

This report series is complemented by a sister series of 46 catchment reports which describe the water quality, risk, pressures and other relevant data for each waterbody in each catchment. All reports are available on www.catchments.ie.

An online interactive mapping system, where the most up to date data can be viewed, is available at [EPA Maps](#).

Data can be downloaded from the EPA geoportal site at <https://gis.epa.ie/GetData>.

Impacts of Drained Peat on Water Quality

Peatlands account for approximately 20% of the land area in Ireland. Peatlands provide a range of functions, including maintaining biodiversity, carbon storage and sequestration, water quality, and regulation of flows. Peat extraction for commercial or domestic purposes, and modification or drainage of peatlands for other uses such as forestry or agriculture, has been identified as a significant pressure in just over 6% of waterbodies that are considered 'At Risk' of not meeting their water quality objectives (Table 1 and Figure 1). Waterbodies are categorised as being 'At Risk' of not achieving its WFD objectives where the monitoring data shows evidence that water quality is impacted, and actions are required to deliver water quality improvements. Based on the most recent characterisation assessment, using data up to 2021, this is the eighth most prevalent significant pressure type and is related to a mixture of licensed (50%), unlicensed (23%) and other activities (27%).

Table 1: Number of 'At risk' waterbodies with drained peat as a significant pressure

Waterbody Type	No. Waterbodies	No. At Risk waterbodies	No. Waterbodies with Peat identified as a significant pressure	% At Risk waterbodies (with Peat identified as a significant pressure)
River	3192	1337	103	8
Lake	812	142	2	1
Transitional	196	60	0	0
Coastal	112	16	0	0
Groundwater	514	94	1	1
Total	4826	1649	106	6%

Water quality impacts arising from drained peat

The main impacts on water quality and river habitat arising from peat extraction and drainage include the release of pollutants to water such as ammonium and fine-grained suspended sediments, and the physical alteration of aquatic habitats which causes hydromorphological impacts. The drainage channels result in a lowering of the water table which disrupts the ecosystem balance as well as providing flow pathways for fine sediment and ammonium to reach waterbodies.

Ammonia is produced when organic compounds are decomposed through microbial action induced by drainage/lowering of the water table. Un-ionised ammonia is toxic to fish. Ammonia is oxidised into ammonium and then nitrite and nitrate through nitrification. In waterbodies that are currently 'At risk' of not achieving their water quality objectives, where peat is a significant pressure, the annual average concentration of ammonium is often elevated above the environmental quality standard (EQS) of 0.065 mg/l as N that is required to support Good Ecological Status. Over the last decade however, these waterbodies have generally shown a consistent reduction in ammonium concentrations (Figure 2), and in recent years, average concentrations in some of these waterbodies have dropped below the standard. Further work is planned during the third cycle to understand the reasons for this.

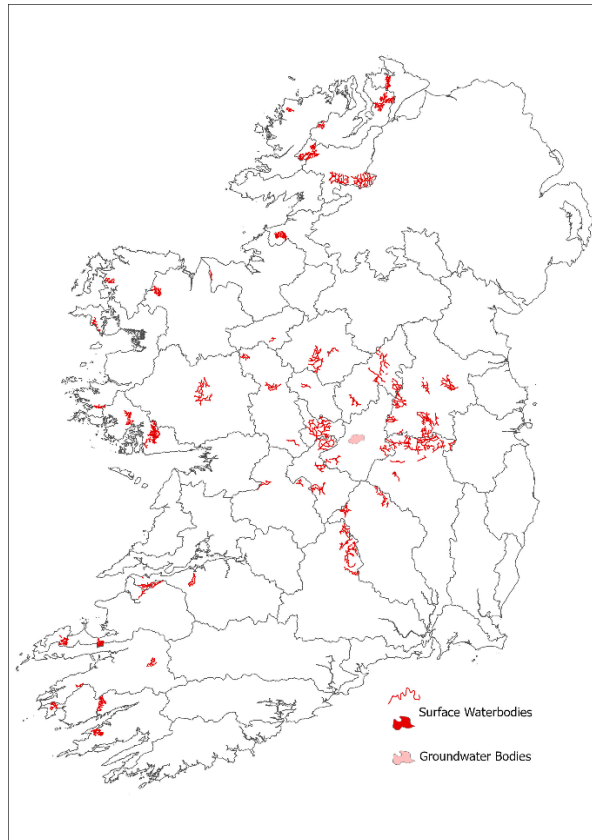


Figure 1: Waterbodies where peat is a significant pressure (August 2023).

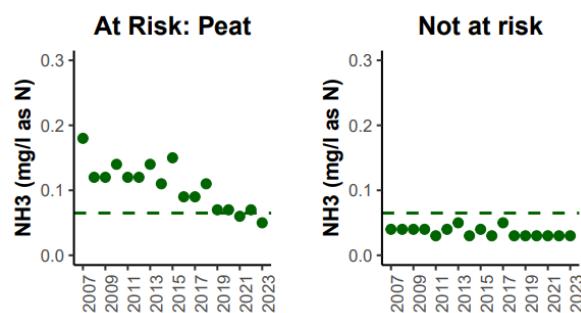


Figure 2: Average annual ammonium concentrations in Rivers from 2007-2023 for waterbodies 'At risk' of not achieving their objectives, with Peat as a significant pressure, versus those considered Not at risk.

In addition to elevated ammonium concentrations, drainage of peatlands also results in changes to the hydromorphological (or physical) condition of rivers, for example, modification of the channel bed and riparian area, river channel diversions altering the river network, increasing the connectivity of land drains to the river network, and altering the flow and sediment regime. Biological monitoring has indicated that excess suspended sediment is occurring in some waterbodies where peat is a significant pressure, which can build up on stream beds and clog stream gravels, impacting on fish spawning and invertebrate habitats.

Change since the second river basin management cycle (2016-2021)

Overall, the number of waterbodies with drained peat as a significant pressure has decreased in recent years, with 116 *At Risk* waterbodies identified as impacted based on an assessment in 2015, decreasing to 106 waterbodies based on an assessment in 2021 (Figure 3). Of the 116 waterbodies

where peat was identified as a significant pressure in 2015, 99 of these had not achieved their environmental objectives as outlined in the 2021 assessment, however environmental objectives have been met in 17 waterbodies. These 17 waterbodies are located along the western border and in the midlands and included a combination of licensed and unlicensed peat extraction sites.

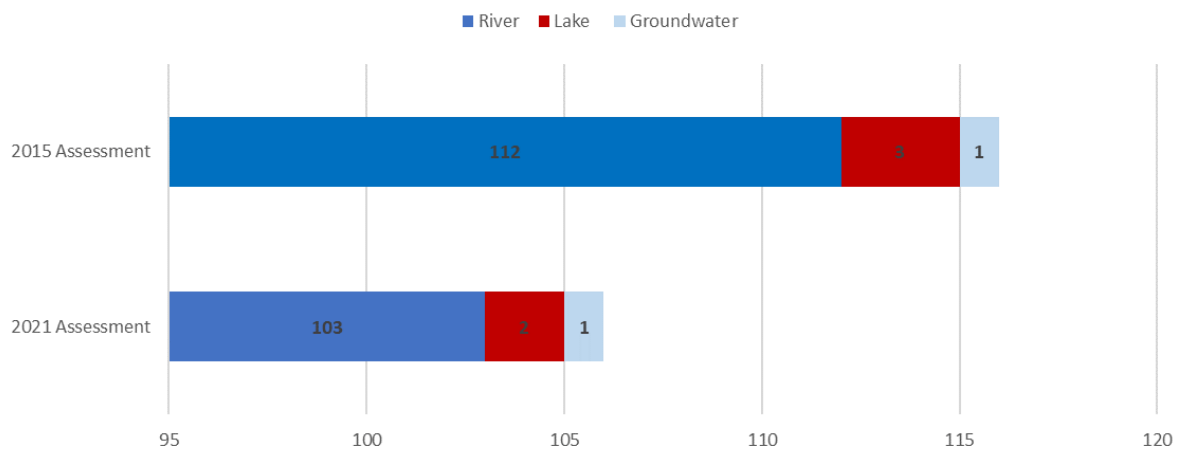


Figure 3: Change in Peat Pressures between the end of the first cycle in 2015 and the end of the second cycle in 2021.

What is being done?

Following Bord na Móna ceasing peat production at their peatlands in February 2021, funding was made available to carry out enhanced rehabilitation works on 80 bogs (covering 33,000ha) through the Peatlands Climate Action Scheme (PCAS). In the first three years of the scheme, Bord na Móna have submitted 50 plans to the EPA for review and rehabilitation works on 21,476 ha of peatlands have been approved by the EPA. Quarterly monitoring is carried out on outfalls from rehabilitated peatlands to assess water quality post rehabilitation.

While water quality impacts from peat activities are reducing, the number of waterbodies impacted remains high and requires mitigation. To support this, the EPA over recent years have focused on addressing the impacts of unauthorised peat extraction, through both legal action and engagement.

Mitigation actions for reducing impacts to water quality from drained peatlands include rewetting and blocking drainage channels to prevent large fluctuations in water levels, which will in turn reduce the losses of ammonium and sediment, and improve the physical habitat conditions. The use of settling ponds may also be beneficial in some areas to prevent sediment reaching stream channels. These actions also have multiple benefits for biodiversity, climate change and natural flood water retention and an integrated approach to the implementation of measures is important. Further focus on peatland measures is likely in the coming years with the commitments that each member state will need to make under the new EU [Nature Restoration Law](#) which aims to restore ecosystems for people, the climate and the planet.

The National Parks and Wildlife Service (NPWS) has developed a National Peatlands Strategy 2015-2025 that strives to ‘provide a long-term framework within which all of the peatlands within the State can be managed responsibly in order to optimise their social, environmental and economic contribution to the well-being of this and future generations’. It sets out a cross-governmental approach to managing issues that relate to peatlands, including: compliance with relevant national and international environmental legislation, agreements, plans and policies; climate change; forestry; water quality; flood control; energy; nature conservation and restoration; land use planning; and agriculture.

Significant resources are also being directed towards restoring and rehabilitating peatlands and improving our understanding of the issues through research. Some of the projects currently underway include:

- Peatlands for People is a seven year EU Life funded project that commenced in 2020. It consists of three pillars: i) Peatland Excellence, focusing on the restoration and rehabilitation of peatland sites; ii) Just Transition Accelerator, developing a programme focusing on low carbon and circular economies; iii) Discovery Experience, develop a tourist and educational centre to promote sustainable living. See <https://peatlandsandpeople.ie/>.
- Farmpeat (Farm Payments for Ecological and Agricultural Transitions) is a project focusing on the development of a results based scheme for farmers managing lands that surround raised bogs or former raised bogs. See <https://www.farmpeat.ie/>.
- Farm Carbon EIP is a two year pilot project, that commenced in 2022, that also aims to deliver a results based payment scheme for agricultural peatlands. It focuses on nature loss, greenhouse gas emissions and water pollution. See <https://farmcarbon.ie/>.
- Peat Hub Ireland is a one year project, funded by the EPA and Department of Agriculture Food and the Marine, collating research regarding the sustainable management of Irish peatlands to identify knowledge gaps, trends, risks and opportunities. See <https://www.ucd.ie/peat-hub-ireland/>.

Additional actions have been highlighted in the third River Basin Management Plan (Water Action Plan 2023).

Find out more

See how the impacts of pressures on waters are assessed, including peat related pressures, at www.catchments.ie/download/water-framework-directive-guidance-on-characterisation-methodology-v5-0-2024.

You can view the individual waterbodies where peat is a significant pressure on [EPA Maps](#)

The mid-term review of the National Peatlands Strategy 2015-2025 is at <https://www.npws.ie/sites/default/files/files/EN%20National%20Peatlands%20Strategy%20Mid-Term%20Review.pdf>

Information relating to Bord na Móna's Peatlands Climate Action Scheme can be found here: [Bord na Móna Peatlands Climate Action Scheme \(bnmpcas.ie\)](#).