

Northern Ireland Peatland Strategy 2021-2040

Consultation Document 2021



Sustainability at the heart of a living, working, active landscape valued by everyone.

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June 2021

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Glossary

Acrotelm - The acrotelm is one of two distinct layers in undisturbed peat bogs. It overlies the catotelm. The boundary between the two layers is defined by the transition from peat containing living plants (acrotelm) to peat containing dead plant material (catotelm).

Areas of Special Scientific Interest (ASSI) - Areas of Special Scientific Interest (ASSIs) are protected areas that represent the best wildlife and geological sites in Northern Ireland. They are declared under the Environment (Northern Ireland) Order 2002.

Biodiversity - Biodiversity is defined as the diversity of all living things at genetic, species and ecosystem levels.

Bog - A particular type of wetland, which is waterlogged by direct rainfall only. Bogs are nutrient-poor and acidic habitats, support a less diverse range of species than other wetlands and contain many unique species that are specialised to bog peatlands.

Carbon Sequestration - A natural or artificial process by which carbon dioxide is removed from the atmosphere and stored.

Climate Adaptation - Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate the impact of climate change.

Climate Mitigation - Process to reduce or prevent emission of greenhouse gases, either by using new technologies or renewable energies or by changing management practices and/or consumer behaviour.

Ecosystem - A biological community of interacting organisms and their physical environment.

Ecosystem Services - the benefits people derive from ecosystems. Besides provisioning services or goods like food, wood and other raw materials, plants, animals, fungi and micro-organisms provide essential regulating services such as pollination of crops,

prevention of soil erosion and water purification, and a vast array of cultural services, like recreation and a sense of place.

Favourable Condition - A feature(s) within a Designated Site is being adequately conserved and monitoring demonstrates that the features are meeting mandatory requirements.

Fen - A fen is a wetland that receives water and nutrients from surface and/or groundwater, as well as from rainfall. Fen vegetation is typically more diverse than that found in bogs due to variation in water supply and the range of nutrients and dissolved nutrients in the water.

Natural Capital - Stocks of natural assets that provide valuable flows of ecosystem services for society.

Nature-based Solutions - Nature-based Solutions are actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.

Peatlands - Peatlands are wetland ecosystems that are characterised by the accumulation of organic matter called peat, which derives from dead and slowly decaying plant material under wet conditions.

Restoration - The process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed. It takes time and can often be a process which requires multiple interventions and monitoring.

Restored Peatland - Formerly modified peatland where human activities have led or are expected to lead to a recovery of its natural function.

Semi-natural Vegetation - Vegetation impacted by deliberate or inadvertent human disturbance, but which has recovered to such an extent that species composition and environmental and ecological processes are close to its natural state.

Special Area of Conservation (SAC) - SACs are part of the Natura 2000 network of sites designated under the EU Habitats Directive. The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) transpose the Habitats Directive in Northern Ireland.

Special Protection Area (SPA) - SPAs are part of the Natura 2000 network of sites designated under the EU Birds Directive. In Northern Ireland, the provisions of the Birds Directive are implemented through a number of domestic legislative provisions.

Sphagnum Moss - *Sphagnum* is a genus containing almost 400 species of moss, of which around 20 are found in the UK. They are commonly referred to as “peat mosses”. They are highly resistant to decay and contain a chemical called sphagnum that inhibits microbial activity. This slows decomposition and is the main contributor to the formation of peat.

Sustainable Management - Management of natural resources in a way and at a rate that maintains and enhances the resilience of ecosystems and the benefits they provide.

Turbary - The term used to describe the right to cut turf on a particular area of bog,

Wetland - Land area that is saturated with water, either permanently or seasonally.

Executive Summary

The Northern Ireland Peatland Strategy identifies the ecosystem services provided by healthy peatlands, including climate regulation and adaptation, specialised biodiversity, good water quality, flood alleviation and a historical archive. Peatlands also provide a unique landscape for recreation and education.

However, most of our peatlands have been damaged to some degree, are in poor condition and will require more sustainable management and restoration.

Restoring our peatlands will require a collaborative approach involving government, landowners, land managers, public sector bodies and environmental groups, guided by scientific and technical expertise, appropriate legislation and policies and with a robust funding mechanism in place.

A cross-sectoral group, the Northern Ireland Peatland Partnership will provide oversight and ensure delivery of the Strategic Objectives and Actions contained within the Strategy.

Introduction

Peatlands are one of the most valuable ecosystems on Earth - although they occupy just 3% of the Earth's land surface, they are of enormous importance to the stability and general well-being of our environment – in tropical and boreal regions, they have natural tree cover and may be categorised as 'forest'. Other peatlands, for example many within the Arctic and temperate zone, are naturally treeless with woodland restricted to the bog margins. They create distinctive upland and lowland landscapes, support a range of specialised plants and animals and also act as a major store of soil carbon. Peatlands also provide a range of other Ecosystem Services, such as water purification, flood alleviation, recreational opportunities and contain a historical archive.

They are of global significance for biodiversity with the majority of peatland habitats threatened or declining. During the 2016 International Union for Conservation of Nature (IUCN) World Conservation Congress, a motion was passed on peatland conservation, calling for better protection and restoration of peatlands – this signified a growing acknowledgement of peatland conservation and restoration as a nature-based solution to climate change, decreasing water quality and biodiversity loss. The importance of peatlands is also reflected in international obligations emanating from the Convention on Biological Diversity (CBD) regarding enhanced ecosystem resilience through conservation and restoration of degraded ecosystems and the UK's obligations to report Greenhouse Gas emissions under the United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol and Paris Agreement.

In June 2019, the UK Parliament enshrined into law, the 'UK Net Zero target', which commits the UK to reduce net greenhouse gas emissions by "at least" 100% below 1990 levels by 2050. This is a significant increase on the former target under the Climate Change Act (2008) of an 80% net reduction in such emissions by 2050. The major change required to meet this UK Net Zero target will be a combination of more rapid reduction of greenhouse gas emissions and carbon sequestration. The UK's Climate Change Committee has advised that land use change and in particular nature based solutions (such as afforestation, biomass

production and peatland restoration) should be a significant element of a holistic strategy to deliver this target.

While the UK Climate Change Act 2008 extends to Northern Ireland, it doesn't set a specific greenhouse gas emissions reduction target for Northern Ireland and there is currently no specific Northern Ireland climate change legislation. It is implicit however, that Northern Ireland does its fair share of required greenhouse gas emissions reductions in order to meet the UK Net Zero Target.

The 'New Decade, New Approach' agreement contains a commitment that 'The Executive will introduce legislation and targets for reducing carbon emissions in line with the Paris Climate Change Accord'. The agreement further states that 'The Executive should bring forward a Climate Change Act to give environmental targets a strong legal underpinning'. As a result of this, work is ongoing with the aim to bring forward a Climate Change Act for Northern Ireland within the lifetime of the current Assembly mandate (March 2022). As part of that work and to inform the Act's development, DAERA carried out a public consultation on a 'Discussion Document on a Climate Change Bill', which closed on the 1 February 2021. The responses to that consultation, and advice received from the Climate Change Committee on Northern Ireland's fair and equitable contribution to UK Net Zero, have informed the development of policy proposals for a Climate Change Bill and approval of these proposals is currently being sought from the Northern Ireland Executive.

To meet the UK Net Zero target, the UK Government has set 5-yearly carbon budgets which currently run until 2037 – these restrict the amount of greenhouse gas the UK can legally emit in the associated 5 year carbon budget period (2033-2037). On 9th December 2020 the UK Climate Change Committee provide their advice and recommendations on the level of the Sixth Carbon Budget (2033-2037). Along with their advice on the level of the Sixth Carbon Budget the UK Climate Change Committee published their advice on what would be Northern Ireland's fair and equitable contribution to the UK Net Zero target by 2050. Their advice set out the pathway to achieving UK Net Zero by 2050 and recommended that Northern Ireland's fair and equitable contribution to achieving UK Net Zero should be a reduction in emissions of greenhouse gas emissions by at least 82% by 2050. The UK Emissions Inventory is currently being revised to include the addition of carbon emissions from peatland. The

current inventory only captures about 1.3Mt CO₂e of emissions from peatland, but all sources of peatland emissions will be included in the inventory from 2020 and will have the effect of increasing Northern Ireland's stated greenhouse gas emissions by around 10%.

Green Growth

DAERA, on behalf of the NI Executive, are developing a Green Growth Strategy and associated Climate Action Plan which will be our initial route map to climate action, green jobs and a clean environment. The Strategy will look out to 2050 and provide a pathway with sector-specific greenhouse gas emission targets. It will also set a pathway for a clean environment and green jobs. This is because tackling climate change needs a holistic approach, requiring transformation of our society and economy that also recognises and addresses the challenges facing our environment. The associated Climate Action Plan will focus on the short term actions we must take across all sectors.

Peatlands make a significant contribution to current emissions and as a potential carbon sink and important habitat are part of the solution to NI meeting its NDNA and UK Net Zero commitments and Programme for Government Outcomes. As such it will be a key component of Green Growth and a Peatland Strategy should aim to align closely with its aims.

Peatland Strategies

In 1993, the then Department of Environment, issued a policy statement "Conserving Peatland in Northern Ireland" which had a focus on protected site declaration. However, much has changed since then, both in our appreciation of peatland biodiversity and also in our understanding of continuing and emerging threats to our peatlands.

The UK's first collaborative Peatland Strategy was published by the IUCN UK Peatland Programme in 2018 and aimed to embed a shared vision for our peatlands, encouraged partnership and identified a common way forward for UK Peatlands. There has been significant progress in England, Scotland and Wales – in Northern Ireland however, peatland restoration is still in its infancy and we have considerable work to do to catch up, although

there are ongoing peatland restoration projects here e.g. Peatlands Park, Garry Bog and Cuilcagh.

The Scottish Government has signalled its commitment to peatland restoration and to nature based solutions to the climate and biodiversity crisis, publishing its budget for 2020/21 in which is provided £20m for peatland restoration and a commitment to invest £250m over the next 10 years. In England, multi-million pound grant schemes to restore iconic peatlands have been made available, in addition to the support for Peat Pilots, taking forward the restoration of five of England's most iconic peatlands sites. In Wales, the LIFE Welsh Raised Bogs project aims to restore seven of the very best examples of raised bogs in Wales, which represents 50% of this habitat in Wales.

Ireland published its Peatland Strategy in 2015 and a Management Plan for its Raised Bog SAC network in 2017, which set out a roadmap for the long-term management, restoration and conservation of protected raised bogs. They have also committed to an accelerated exit to the use of peat for power generation.

In the New Decade, New Approach document, all political parties in Northern Ireland recognised the need for a coordinated and strategic approach to the challenge of Climate Change within the Programme for Government. They accepted that actions and interventions would be required across a wide range of areas in order to address both the immediate and longer term impacts of climate change in a fair and just way.

It is in this context, facing the twin challenges of climate change and significant biodiversity loss, where peatland restoration, offers a major opportunity, that this Northern Ireland Peatland Strategy has been developed. The Strategy includes 6 Strategic Objectives, each with a series of Actions.

In order to deliver on the Strategy Objectives, it is the intention of DAERA to develop a robust Northern Ireland Peatland Strategy Implementation Plan with measurable targets, milestones, delivery partners and costings identified, in order to return semi-natural peatlands in Northern Ireland to a healthy state. Given the scale of activity required, this will be a long term programme with the attendant need for appropriate financial resources to support delivery.

Semi-natural Peatland Habitats in Northern Ireland

In Northern Ireland, semi-natural peatland can be divided into three broad habitat types: lowland raised bogs, blanket bogs and fens:

- **Blanket bog** is a globally restricted peatland habitat confined to areas with a cool, wet, typically oceanic climate. It is, however, one of the most extensive semi-natural habitats in the UK and Ireland. They primarily form in upland areas above 200m with a high annual rainfall and cool temperatures. The thickness of peat can vary between 1m and 6m. Like lowland raised bogs, blanket bogs receive their nutrients from rainwater and the atmosphere, and are acidic. Blanket peat began to form in Ireland around 5,000 years ago.
- **Lowland raised bogs** are located in low lying areas, generally below 150m, such as river valleys, lake-basins, and between drumlins. They often develop from fen peat. The surface of a lowland raised bog is elevated above the influence of ground waters so that the ecosystem is exclusively rain fed with low levels of nutrients. The bog is colonised by plants and animals adapted to the acidic conditions and low levels of nutrients found there. This favours the growth of plants such as heather, cotton grasses and, most importantly, *Sphagnum* mosses. These plants die to form peat that can accumulate up to a depth of 12 metres. Lowland raised bogs began to form in Ireland around 10,000 years ago, at the end of the last ice age.
- **Fens** are minerotrophic peatlands which receive water and nutrients from soil, rock and ground water as well as from rainfall. They occur in poorly drained basins or inter-drumlin hollows, along lake margins or on river flood-plains. In a fen, the plants receive their nutrients from groundwater or from surface runoff. Fen peat is generally thinner than bog peat and less acidic, often even alkaline, due to the presence of minerals in the groundwater. Fens covered large areas some 7500 years ago, most of them subsequently evolving into lowland raised bog by natural succession.

Natural Capital & Ecosystem Services

What do Peatlands do for us?

Natural Capital can be defined as the world's stocks of natural assets which include geology, soil, air, water and all living things. It is from this natural capital that humans derive a wide range of services, often called ecosystem services that make life possible.

The Millennium Ecosystem Assessment defined Ecosystem Services as “the benefits people derive from ecosystems”. Besides provisioning services or goods like food, wood and other raw materials, plants, animals, fungi and micro-organisms provide essential regulating services such as pollination of crops, prevention of soil erosion and water purification, and a vast array of cultural services, like recreation and a sense of place.

Healthy, functioning semi-natural peatlands provide a range of valuable eco-system services for society including:

- climate regulation and adaptation (carbon capture and storage)
- unique biodiversity & habitat for wildlife
- drinking water filtration
- flood attenuation and water storage
- an historical archive
- areas for recreation and understanding of our cultural heritage
- food production

A large body of evidence demonstrates the value that semi-natural peatland restoration has in enhancing the delivery of these ecosystem services, providing significant return on investment.

Peatlands & Carbon

Semi-natural peatlands represent the largest single store of global soil carbon and have a greater density of stored carbon than any other ecosystem. It is estimated that temperate peatland contains around one quarter of terrestrial carbon. Intact peatland accumulates carbon estimated at 12% of human-instigated carbon release worldwide annually.

Conversely, if they are drained or dry out and cease to grow, they no longer accumulate carbon but release it back to the atmosphere, adding to the greenhouse gases which are causing climate change. In Northern Ireland, while semi-natural peatlands only covers 12% of the land area, they account for 53% of the soil carbon pool.

Semi-natural peatlands also release methane which is a potent green-house gas, but the amount is minimal in comparison to their storage of carbon. Countries can use the carbon storage capacity of peatlands to offset a proportion of their carbon emissions and thus reduce their carbon output. Carbon trading between countries is currently permissible so the carbon stored within peatlands may also have an economic benefit.

Semi-natural peatlands have the potential to be a natural solution to reducing greenhouse gas emissions. They hold a vast stock of carbon in their soils and can add more by sequestering carbon from the atmosphere. But this natural carbon capture and storage ability can only happen if peatland habitats are healthy and functioning.

Peatlands & Biodiversity

Blanket bogs, lowland raised bogs and fens in Northern Ireland occur where waterlogged conditions slow down the natural decomposition of plant remains allowing peat to form, and provide important habitat for highly specialised plant species that have adapted to surviving in these harsh environments. Due to their specialisation, many of these plants are poor competitors and not viable outside a peatland environment.

On blanket bogs and lowland raised bogs, key plant species include peat-forming plants particularly bog mosses *Sphagnum* species and Cotton-grass *Eriophorum* species with a limited range of other characteristic species including Heather *Calluna vulgaris*, Cross-leaved Heath *Erica tetralix*, Deer Grass *Trichophorum cespitosum* and Purple-moor Grass *Molinia*

caerulea. They are also important for a rich and unique assemblages of invertebrates and breeding birds such as Golden Plover, Curlew and Hen Harrier.

Fens are highly diverse habitats which support a very wide range of plant and animal species - they are particularly important for invertebrates; these include dragonflies such as the Irish Damselfly, Water beetles, Carabid beetles, pond skaters, and butterflies and moths such as the Marsh Fritillary Butterfly. A number of locally rare plant species are associated with Fens such as the Fen Bedstraw *Galium uliginosum*, Greater Water-parsnip *Sium latifolium*, Grass of Parnassus *Parnassia palustris*, Irish Lady's-tresses *Spiranthes romanzoffiana*, Marsh Helleborine *Epipactis palustris* and Marsh Pea *Lathyrus palustris*.

Peatlands & Water Regulation

Peatlands are valued for their capacity to store, filter and provide water. They reduce the risks of flooding, serving as a buffer against rapid run off during heavy downpours. They help maintain a consistent supply of clean water to rivers, loughs and reservoirs. Reservoirs that drain areas of blanket bog on the Garron Plateau, the Sperrin Mountains and Mourne Mountains provide much of our drinking water in Northern Ireland. Exposed or dry peat on degraded peatland is more susceptible to erosion and can contribute to high organic content and the supply of poor quality raw water to reservoirs. This increases costs during the water treatment process to remove colour, turbidity and organic matter from the peat-stained water, which can cause issues in the network as well as taste and odour problems.

Peatlands & Archaeology

Peat also preserves a unique and irreplaceable record of past human activity, ecology and climate. Archaeological research has revealed much evidence of human activity through the preservation of artefacts such as canoes, bog butter and even human bodies. The peat sequence also holds information on past ecology and climate in the form of sediments and pollen. Several lowland raised bogs are also of international importance for vulcanism over much of the Holocene (post 10,000 years before present) with volcanic glass shards (tephra) recorded in the peat column. These bogs are also of international importance for peat stratigraphy providing much of the dendrochronology for radiocarbon calibration.

Peatlands & Landscape

Peatlands contribute to the character of the Northern Ireland landscape; indeed, for many visitors they would be considered emblematic. Society values wild and mountainous and unspoilt areas for their scenic qualities and these areas attract tourists and walkers, who play an important role in the local economy. The number of people interested in outdoor recreation and eco-tourism has increased in recent years which can result in negative impacts for peatlands, if not properly managed. The value people place in these landscapes can also be seen through elements of culture in poetry, writing and art.

Peatlands and Food Production

Upland areas provide large areas of grazing land, primarily for hill sheep, and have an important role in hill-farming. Bogs are particularly sensitive to overgrazing and trampling and in recent decades, overstocking has impacted on upland landscapes and biodiversity. A major element of agri-environment and other land management schemes is establishing grazing regimes that allow recovery and sustainable management of habitats and which support ecosystem service delivery. However, getting the right grazing levels suitable for these areas (neither under-grazing nor over-grazing) and undertaking sensitive restoration, such as drain blocking, the condition of the peatlands can be improved and these impacts eventually reversed.

Peatland Restoration and Job Creation

As part of the green recovery, it is vital that we invest in nature-based solutions which, amongst other things, are a key mechanism for tackling climate change. Peat restoration delivers carbon and biodiversity benefits and thus can deliver significant savings for the public purse, but it can also lead to job creation e.g. in peatland restoration activities and ecotourism. Investing in large-scale peatland restoration also brings with it an opportunity to build capacity and ensure the provision of ongoing employment opportunities.

Threats and Costs to Society of Damaged Peatlands

Appreciation of the importance of peatlands is relatively recent and past practices have left many in a damaged state. In the past, land use has concentrated on use of peat for fuel and drainage for agriculture and forestry.

Peat Extraction

Traditionally, peat cutting was undertaken by manual cutting so only small blocks were harvested at a time. Since the early 1980s there has been a trend towards mechanised peat extraction, which has greatly accelerated bog degradation and loss. Mechanised peat removal has a major ecological impact, stripping away the living layer and subsequently exposing large quantities of peat to oxidation and loss of carbon. Neighbouring areas of bog within the same hydrological unit can become degraded as a result of the drastically lowered water table. Archaeological sites and deposits, which occur at various depths, are no longer easily identified and many are damaged or removed by such activities. Bog bursts are a natural event brought on by excessive rainfall events, but can be exacerbated by peat cutting, drainage and burning.

Afforestation

Following the Second World War, peatland afforestation in Northern Ireland expanded as a result of improved technological development of machinery for drainage, a better understanding of tree nutrient requirements and identification of suitable tree species which enabled forests to be successfully established and grown on these sites. Government policy in the 1970s and 1980s led to an increase in forest planting. By the early 1990's, Government commitment to conserving biodiversity through international agreements and legislation including the UN 'Earth Summit'(1992), and Habitats Directives (1992) resulted in the development of forest policy which presumed against further afforestation of peatland.

Today 44% of the state forest is on peat soils, consisting of mostly Sitka Spruce and Lodgepole Pine and the resulting timber production supplies approximately 40% of the annual timber production from Forest Service woodland for the home grown timber processing market. These forests also sequester atmospheric carbon to mitigate climate

change and 20% of the national forest estate (including open ground), mostly on peat soils, are designated as SPA for hen harrier and/or merlin. The forests also provide public access for recreation and tourism in the uplands and regulate the water environment both in relation to flood protection and water quality.

The contribution of trees to help mitigate climate change is now widely known, however in some circumstances, re-establishing productive forestry on deep peats may cause a net loss of carbon. Research to date has shown that the greatest potential for a positive carbon balance from a second rotation is where a good rate of tree growth is likely. Equally the greatest potential for successful and early restoration of peatland to improve the net carbon sink is generally on the flattest peat sites which have yielded very poor tree growth.

Drainage

Since healthy peatland ecosystems all depend upon the maintenance of a high water table, any drainage is damaging. The impact varies depending upon a range of environmental factors in addition to the actual drainage operation itself. However, it is likely that active peat formation will, at best, be inhibited and at worst, it will result in the peat becoming inactive, causing carbon loss into the atmosphere and producing rapid runoff into rivers and streams.

Burning

The damage to a peatland by burning depends on the intensity and frequency of burning. Many of the rare and sensitive plants found on peatlands cannot survive fires. Repeated burning also decreases the cover of *Sphagnum* and so decreases the capacity to generate new peat. On deeper peat, burning can lead to a shift away from moss to heather-dominated vegetation, with soil carbon negatively affected as peat would accumulate more slowly. Wildfires on peatbogs are a serious concern as once established they are difficult to extinguish and can release significant amounts of carbon.

Grazing

On bogs, inappropriate levels of grazing and trampling from grazing livestock can have adverse effects on the peatland ecosystem. Ultimately, it results in loss of peat-forming vegetation and consequent drying out of the bog surface. In sensitive locations, the end-result of persistent high stocking levels is that the acrotelm is lost completely, lowering peatland resilience and making sites more susceptible to other damaging events.

On fens, high grazing levels can result in excessive poaching and nutrient enrichment though conversely, lack of grazing or mowing can result in a loss of low growing plant communities and loss of Fen to reedbed or woodland and an eventual drying of the site.

Peat Sediment in Water Bodies

Much of our drinking water originates from upland, peat-dominated catchments. Peatlands that are degraded can result in the release of suspended sediments, causing issues for water quality and drinking water provision. Dissolved organic carbon (the brown colour of peaty water) has to be removed during the processing of drinking water, resulting in higher costs – the raw water becomes harder to treat, treatment is energy intensive, and water treatment additives and infrastructure are required. Excess peat sediment carried into rivers and water bodies can build up on stream beds and clog stream gravels, impacting on fish spawning and invertebrate habitats.

Renewable Energy

Many wind farms are located on peatlands because these sites are typically windy, remote, and generate low returns from agriculture and other land uses. Wind farm developments can have impacts at the construction, operational and de-commissioning stages. Potential impacts from wind farms include: direct habitat loss through construction of wind farm infrastructure, and habitat modification and (in the long-term) habitat loss if there are adverse changes to the overall hydrology and structural integrity of the peatland.

Deposition of Atmospheric Nitrogen

Nitrogen is an essential plant nutrient. However, at higher deposition rates (>5-10 Kg N/ha/year), the capacity of *Sphagnum* to utilise nitrogen is exceeded. There may be direct inhibitory effects of excess nitrogen on *Sphagnum* and it can be outcompeted by faster-growing vascular plants exploiting the nitrogen excess. Excessively high ammonia concentrations in the air at peatlands (>1.0 µg m⁻³) can have a toxic effect on the growth of a range of nitrogen sensitive plant species, leading to die-back of *Sphagnum*, lichens and dwarf shrubs. In Northern Ireland most of our nitrogen sensitive habitats are receiving too much nitrogen and are exposed to damaging levels of ammonia in the air.

Invasive Alien Species

The high moisture content and low nutritional value of peatland habitats can act as a natural control for invasive species. However, when peatland habitat is altered, through deposition of atmospheric nitrogen and activities such as drainage, it becomes vulnerable to rapid colonisation by native and non-native species such as Willow and Rhododendron excluding the native bog flora.

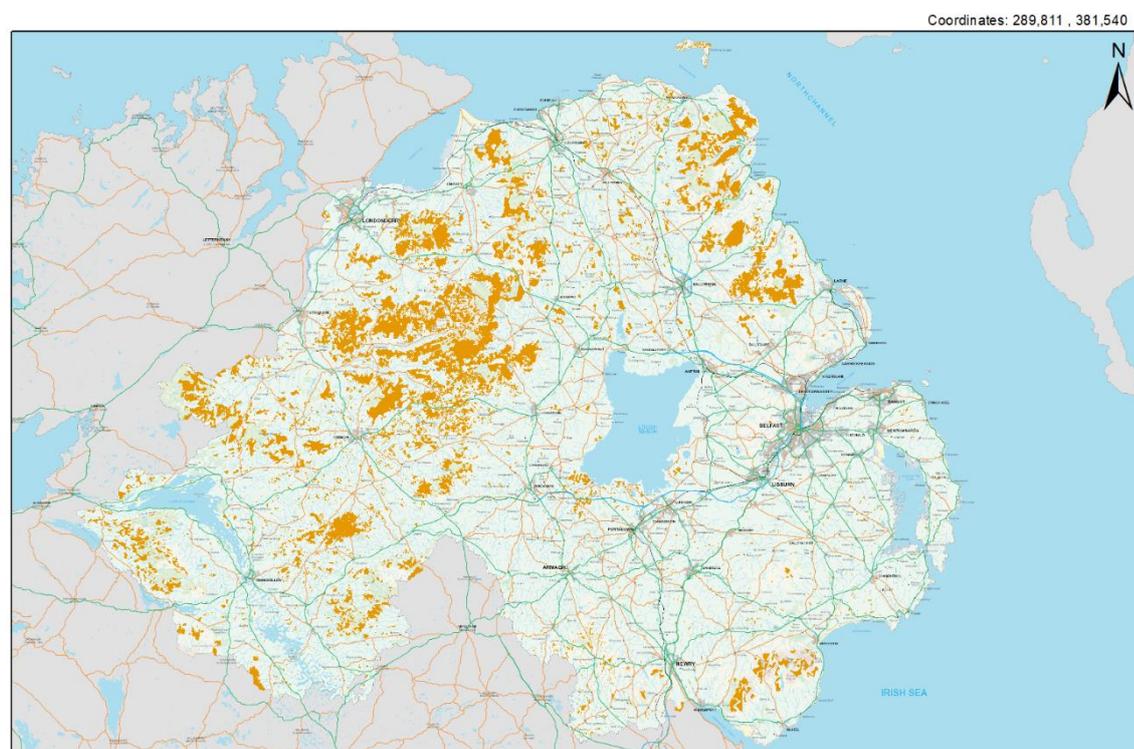
Climate Change

The Millennium Ecosystem Assessment (2005) predicted that by the end of the 21st Century, climate change (with increasing temperatures and changes in rainfall pattern) would be the major cause of biodiversity loss – these predicted changes are likely to have a major impact on peatland ecosystems on the island of Ireland. Higher temperatures will lead to the drying out of peat and an increased likelihood of wildfire. In addition, an increasing number of heavy rainfall events are likely to cause more erosion on damaged peatlands. As most peatland species are extreme habitat specialists, they may have difficulty in adapting to a rapidly changing climate. However, peatlands in good condition with a healthy *Sphagnum* moss layer, although they may still be at risk of loss, are more likely to have a better chance of withstanding these conditions in future. Healthy peatlands therefore, are highly significant to global efforts to combat climate change and their protection and restoration is vital.

Semi-natural Peatland Resource in Northern Ireland

Semi-natural peatland habitats, ranging from raised bogs found throughout lowland areas, blanket bogs cloaking the uplands, and a wide diversity of fen habitat types, cover approximately 12% of the land area of Northern Ireland and took thousands of years to form. Peat soils cover an estimate 18% of NI's land area. The percentage cover of peatland on the island of Ireland is only exceeded in global terms by three countries, Finland, Canada and Indonesia and as such, our peatland habitats are recognised as being important globally, nationally and locally.

Figure 1: Semi-natural Peatland Resource in Northern Ireland



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 NI Peatland

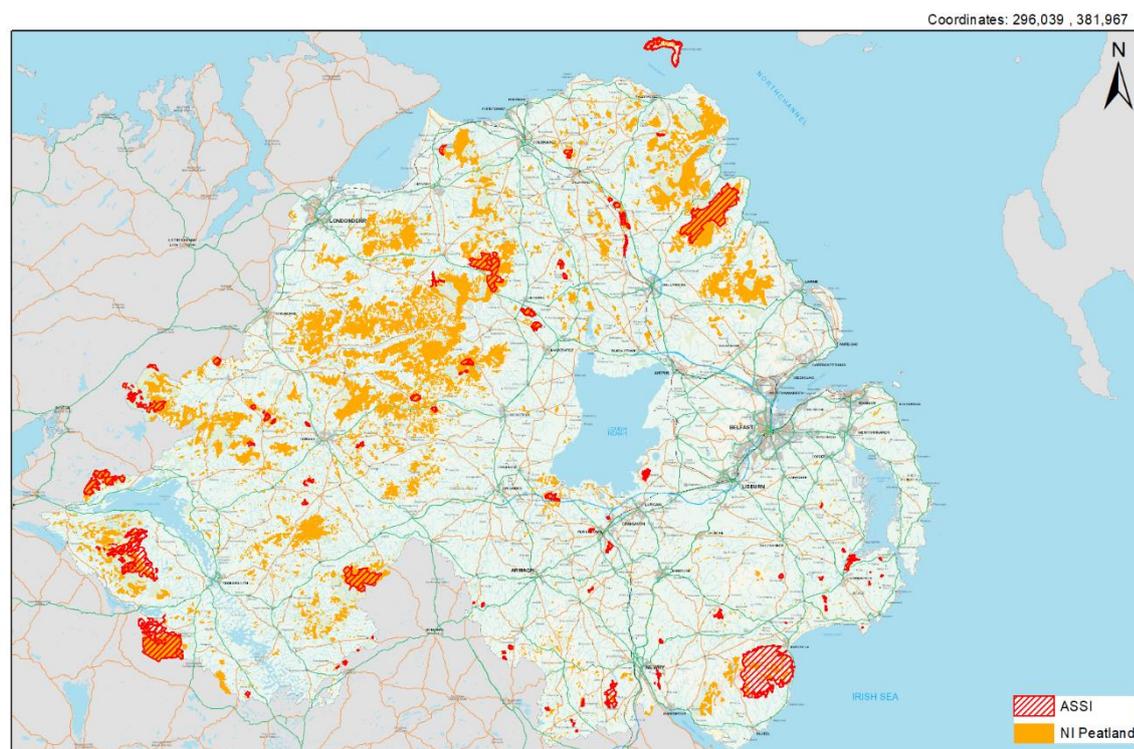
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Protection of Semi-natural Peatlands

The best areas of semi-natural peatland habitats in Northern Ireland are designated and protected under National, European and International nature conservation legislation to afford them the greatest protection. However, site designation only covers around 10% of semi-natural peatland habitat in Northern Ireland.

Figure 2: ASSIs with Semi-natural Peatland as a Feature

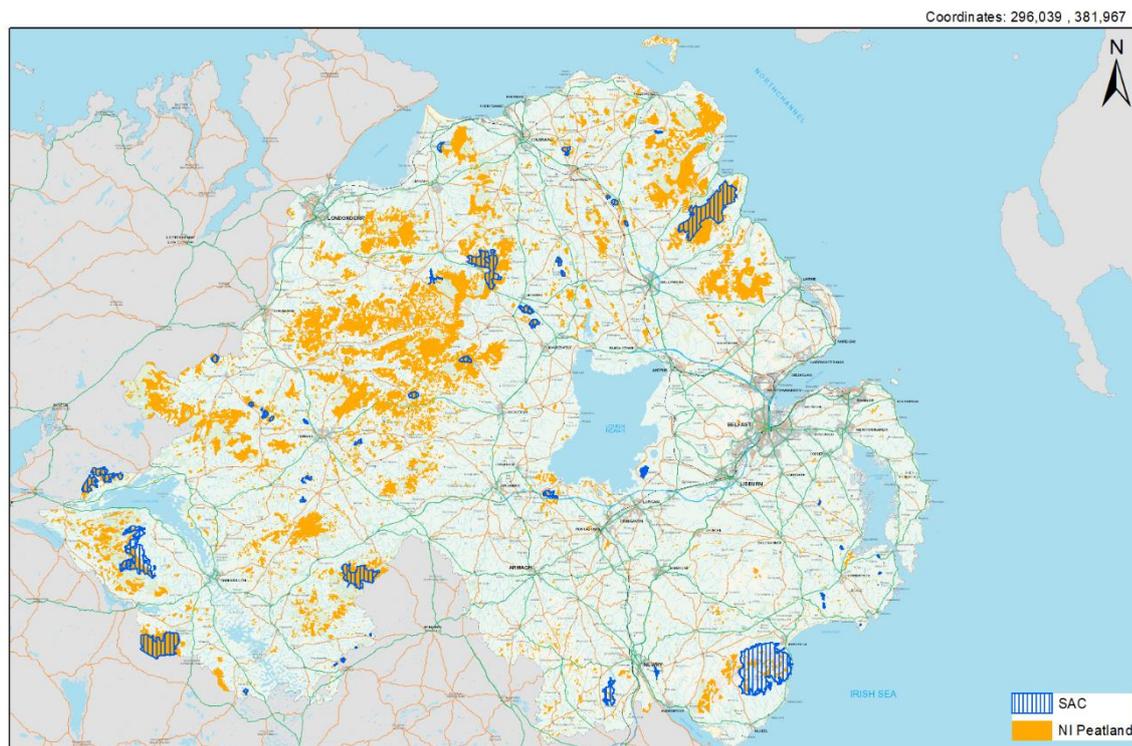


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Figure 3: SACs with Semi-natural Peatland as a Feature



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Condition of Semi-natural Peatlands in Northern Ireland

The condition (and thus the ability to deliver ecosystem services) of Northern Ireland's semi-natural peatlands within the designated site network is assessed via site condition monitoring which is carried out by NIEA staff on a 6-yearly cyclical basis. Semi-natural Peatlands can be described as being in "Favourable Condition" when site condition monitoring demonstrates that they are being adequately conserved and which is defined by setting targets or target ranges for a series of different attributes - components or characteristics of the vegetation that are relatively easy to measure, but which are reliable indicators of the 'health' of the habitat.

Recent condition assessment data for all peatland SACs and ASSIs has demonstrated that a high proportion of the habitat within designated sites is generally 'unfavourable' or at best 'unfavourable-recovering' condition.

At present, little is known about the condition of a significant proportion of the semi-natural peatland resource which lies outside the network of designated sites. Although the most recent information on the condition of the resource outside designated sites is now more than 10 years old, it suggested that the condition of the majority of peatland habitats in the wider countryside was unfavourable.

EU Member States are required to report on the implementation of the Habitats Directive and the conservation status of Annex 1 habitats. The relevant assessments from the 2019 Article 17 report for Northern Ireland Annex I semi-natural peatland habitats can be found at <https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-habitats/>.

Scope, Vision and Aim of the Northern Ireland Peatland Strategy

Scope of Strategy

The scope of this strategy includes peatland with semi-natural vegetation and peat soils that can be prioritised for restoration to peatland with semi-natural vegetation, whether publicly or privately owned.

Vision

The vision of this Strategy is to ensure that all semi-natural peatlands are protected, managed and where possible, prioritised for restoration, so that they can maintain their natural functions, biodiversity and ecosystem services.

Aim of NI Peatland Strategy

The IUCN UK Peatland Strategy (2018) sets the scene for co-ordinated effort and a shared agenda amongst all stakeholders. The overarching aim of this Strategy will be to ensure that, where possible, all semi-natural peatlands in Northern Ireland are conserved or restored to healthy, functioning ecosystems by 2040 and that the ecosystem services that they provide are acknowledged and appreciated.

Strategic Objectives

There are 6 Strategic Objectives with associated targets and actions.

Strategic Objective 1

Conserve peatlands & prevent degradation

Target: By 2040, all peatlands supporting semi-natural vegetation are being managed for their peatland biodiversity and ecosystem function.

Priority Actions

1. Compile a Northern Ireland Peatland Asset Register which will quantify distribution, type, condition, current management practices, potential threats and restoration potential of semi-natural peatland and associated peat rich soils.
2. Develop and implement Conservation Management Plans for Peatland SACs\ASSIs, undertaking restoration actions as required.
3. Identify and declare new peatland ASSIs.
4. Conduct a review and publish a key issues paper which should include the commercial extraction of peat in Northern Ireland, turbary rights (including their historic and cultural role) and the use of peat in horticulture.
5. Conduct a review and publish a paper on the environmental history and cultural heritage value of peatlands to provide a context for conservation and restoration actions.
6. Publish a Position Statement on Upland Management, with accompanying new legislation if required.
7. Develop an agreed and co-ordinated strategic approach among relevant stakeholders to the issue of wildfires.
8. Develop, publish and implement an Ammonia Strategy, which will include priority actions to address nitrogen deposition on peatland.

9. Develop and publish a strategic Peatland Policy and ensure that current and future legislation and policies across Central and Local government are in place for peatland protection and recovery. This may require review and strengthening of the following policies (N.B. this is not an exhaustive list): Site designation & Monitoring, Appropriate Management policies, Planning Policies for Renewable Energy installations, Planning Policies for Peat Extraction, Local Development Plans, Agriculture, Forestry, Land Use policies incorporating cumulative impact of ammonia, Waste Management policies).

Strategic Objective 2

Restoration of degraded areas to functioning peatland ecosystems (designated & non-designated sites)

Target: By 2030, degraded peatland habitats are prioritised for restoration to favourable conservation status. By 2040, all high priority degraded peatlands will be under restoration management.

Priority Actions

10. Compile a list of potential Peatland Restoration Sites to action and a decision-making framework for investment by 2022.
11. Develop and implement Restoration Plans for prioritised peatland sites outside the Designated Site Network.
12. Secure funding and initiate a programme of Peatland restoration projects on both publicly and privately-owned land, in conjunction with stakeholders.
13. Review planning approvals for peatland extraction sites to ensure that all planning conditions are adhered to, including responsibility for reinstatement/restoration.

14. Identify and prioritise areas of afforested peat on Forest Service land for restoration to peatland habitat, particularly where biodiversity and carbon gains would be maximised.
15. Establish peatland restoration demonstration sites on land in public or private ownership with agreement of the landowner.

Strategic Objective 3

Supporting Sustainable Peatland Management

Target: By 2040 – High Priority degraded peatlands in Northern Ireland are under sustainable management.

Priority Actions

16. Develop Land Management schemes through new, post CAP, agricultural policies, which provide targeted support to underpin the appropriate management of all peatlands.
17. Develop a practical infrastructure for delivery of peatland restoration, building on current specialist knowledge, skills and experience providing best value restoration and maximising impact of the investment.
18. Provide funding to facilitate restoration and appropriate management on peatlands with multiple ownership.
19. Commit to Landscape scale peatland restoration partnerships, funded by e.g. Heritage Lottery Fund, LIFE, Peace Plus and ensure match funding is available to enable delivery.
20. Support and where necessary require, landowners to deliver land uses that are compatible with healthy peatlands e.g. sustainable grazing regimes and proactively enable a smooth transition via support for innovation in farming methods and machinery and market development of alternative peat products.

21. Encourage the reduction and cessation of the use of peat by all statutory bodies and agencies by end of 2022.
22. Seek to phase out the use, import and sale of peat compost in Northern Ireland by 2025.
23. Conduct a review on the potential for a ban on peat extraction on all publicly owned land by 2022.

Strategic Objective 4

Knowledge Sharing & Research

Target: By 2025, stakeholders understand the need for peatland conservation and restoration and have the capacity to deliver the Strategic Objectives and Actions contained within the Northern Ireland Peatland Strategy.

Priority Actions

24. Develop a Knowledge Exchange Network to share good practice with other peatland stakeholders via conferences, workshops and site visits.
25. Develop bespoke training courses for landowners/organisations involved in peatland conservation and restoration.
26. Build capacity and develop practical skills training courses for peatland restoration contractors.
27. Commission and fund research into the vulnerability of Peatlands in Northern Ireland to Climate Change, mitigation methods and impacts of peatland restoration.
28. Carry out research into peatland management which can support both biodiversity and farming outcomes at CAFRE Hill Farm and other demonstration sites.
29. Commission and fund research into the long-term effects of Nitrogen Deposition on Peatlands in Northern Ireland.

30. Compile evidence to inform the development of peatland restoration and management plans and identify evidence gaps that require further research.
31. Commission monitoring and evaluation of the restoration programme and citizen science projects.
32. Facilitate research at AFB/CAFRE into alternative growing media.

Strategic Objective 5

Communication, Education & Access

Target: Peatlands are recognised for their unique biodiversity and ecosystem services provision.

Priority Actions

33. Establish a long-term Peatland Communications campaign (in conjunction with other stakeholders) to boost awareness of peatlands, their role in ecosystem service provision and peatland heritage.
34. Peatland Land Managers to consider if possible, facilitating managed access to peatlands for recreation and education.
35. Recreation and education potential to be considered in any future peatland restoration plans. Upgrading traditional routes/old access roads could be considered to facilitate recreational access. Any installation of access facilities may not be desirable or feasible for every site and would need to be landowner led.

Strategic Objective 6

Governance, Implementation & Funding

Target: The necessary structures are in place to deliver on the Strategic Objectives and Actions contained within the Northern Ireland Peatland Strategy.

Priority Actions

- 36.** Develop an Implementation Plan and Reporting Framework for the Peatland Strategy by 2022 with delivery phases, scale and sources of funding and reporting metrics identified.
- 37.** Establish a Peatlands Partnership by 2022 – a multi-stakeholder group - to provide advice and support and to report to the DAERA Minister and the Northern Ireland Executive on the delivery of the Northern Ireland Peatland Strategy and the associated Implementation Plan.
- 38.** Carry out a 3-yearly review on progress with delivery of the Northern Ireland Peatland Strategy and the associated Implementation Plan.
- 39.** Secure long-term funding to implement Peatland SAC Management Plans and Peatland Restoration Plans for sites outside the Designated Site Network.
- 40.** Secure funding for landscape scale peatland restoration and deliver projects in partnership with local communities.
- 41.** Promote the Peatland Code and help facilitate privately-funded projects, working with businesses to take them forward. (Peatland Code is a voluntary certification standard for UK peatland projects wishing to market the climate benefits of peatland restoration).

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Cover photographs courtesy of Paul Corbett:

Front cover - Bog Pools at Cuilcagh Mountain, Co Fermanagh.

Back cover - Hares-tail Cottongrass Slieve Gullion, Co Armagh.

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