Northern Ireland Priority Habitat Guide: Intact and cut-over Lowland raised bog

What is Lowland raised bog?

Lowland raised bogs are peatland which develop primarily in lowland areas below 150m and are generally surrounded by mineral soils. Lowland raised bogs may develop from fen or, if the climate is sufficiently wet, by peat formation directly onto a bare substrate. Continued accumulation of peat elevates the bog surface above groundwater levels from a gently curving dome, from which the term 'raised' bog is derived. Peat depths are greater than 0.5m, but can exceed 12m.

The dome of the raised bog may be totally or partly surrounded by an area of shallow peat or mineral soil subject to ground water influence or periodic flooding, most commonly referred to the as the 'lagg'. Lowland raised bogs should be treated as single interdependent hydrological unit. However, all raised bogs have been subject to past peat-cutting and drainage which has affected natural processes and the extent of bog vegetation. Intact surfaces and cut-over surfaces should be managed for peat-forming active bog vegetation which is the focus of this habitat descriptor. Extensive areas of cut-over bog can also contain areas lacking bog vegetation and should be managed as fen, grassland or woodland priority habitats.

Table 1: Linking Habitat types with Annex 1 features, ASSI features and NI Priority Species

Northern Ireland Priority Habitat type: Lowland raised bog		
Habitat Directive Annex 1 habitats (SAC feature)	**ASSI features**	**NI priority species**
H7110 Active raised bogs H7120 Degraded raised bogs still capable of natural regeneration H7150 Depressions on peat substrates of the *Rhynchosporion*	Lowland raised bog	Irish Hare, Red Grouse, Curlew, Cuckoo, Skylark, Large Heath Butterfly, Marsh Fritillary Butterfly, Bordered Grey Moth, and Marsh Club Moss.

Additional N2K features, ASSI features and NI Priority Habitats and Species may be linked to non-bog habitats found on cut-over lowland raised bogs.

Definition

Lowland raised bog in Northern Ireland is defined as:

- Peatland which have develop primarily in lowland areas below 150m and are generally surrounded by mineral soils.
- Peat depth normally greater than 0.5 m.
- Hydrological units which contain significant (or potentially significant) areas of vegetation dominated by 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 T*richophorum cespitosum* and Purple-moor Grass *Molinia caerulea.*
- Intact lowland raised bog occurs in areas subject that have largely not been subject peat-cutting.
- Cut-over Lowland raised bogs includes areas which have been subject to peat-cutting and may support other priority habitat types.

Lowland raised bog can be confused with Blanket bog where peat is able to form on slopes in marginal upland areas. It can be distinguished by degree of isolation the bog has from adjoining peatlands. Intact and cut-over raised bog should be first considered in the role that it serves in supporting the maintenance of bog vegetation. However, significant areas of cut-over lowland raised bogs sites have little or no active bog vegetation and should be considered as lowland fen, grassland or woodland and managed as such.

The National Vegetation Classification (NVC) codes are useful in determining which habitat types fall within lowland raised bog. NVC codes are provided in the Appendix 2.

Where are they found?

Lowland raised bogs were formerly found in low lying areas throughout Northern Ireland. Many have been cut-over and reclaimed and the main concentrations of intact Lowland raised bogs remaining occur in the Lough Neagh basin, north Antrim and major river valleys such as the Foyle system.

DAERA hold priority habitat and species data on the NIEA Natural Environment Map Viewer. See https://appsd.daera-ni.gov.uk/nedmapviewer/ (and link to video tutorial). Note that the Map Viewer indicates areas which hold NIEA records of habitat / species data, but does not infer the complete coverage of these environmental assets in Northern Ireland.

Why are they important to wildlife?

Lowland raised bogs support a wide range of plants and animals some of which are largely restricted to this habitat. It is important for a number of Northern Ireland priority species including Curlew, Cuckoo and Skylark and the carabid beetle *Carabus calthratus*.

The variety and abundance of flowering plants within semi-natural habitats provide good sources of pollen and nectar for many of our pollinating insects such as bumblebees, hoverflies, butterflies and moths. For further information on habitat management for pollinators, refer to the All-Ireland Pollinator Plan resources: www.pollinators.ie.

Pressures & Threats

The quality and functioning of Lowland raised bog is dependent upon the following conditions: hydrology (any increase in water loss will destabilise the system which must be managed as single hydrological unit); low nutrient levels and surface vegetation integrity, as destruction or alteration of the vegetation will have significant implications on the habitat. Factors which have led to the decline of Blanket bog include, but are not limited to:

- Peat cutting – the extraction of peat for both fuel and horticulture has negative impacts on both the vegetation and water levels and often causes irreparable damage
- Drainage – Lowland raised bogs are impacted by both though lowering regional water tables or local drainage
- Mineral extraction – the extraction of underlying minerals beneath the peat deposits
- Burning/flailing –these can result in simplification of the vegetation structure and the elimination of sensitive species, especially *Sphagnum* bog mosses
- Agricultural improvement – cutover bog in-filled and topped with soil has frequently been converted to pasture in the past and can be of local significance
- Grazing – rough grazing occurs on some lowland raised bogs and is frequently accompanied by drainage, trampling, burning and surface contamination with feed and dung
- Forestry – in addition to the direct hydrological and physical impacts of existing plantations on deep peat, mature trees act as an invasive seed source in neighbouring lowland raised bog areas.
- Scrub encroachment – Downy birch scrub and woodland which frequently develops in cut-over Lowland raised bog and can encroach onto the intact surface, especially where the hydrological integrity of the bog has been damaged resulting in drying of the surface peat
- Recreation and game management – such as clay pigeon shooting or Pheasant rearing is usually very limited in extent and confined to the margins of the raised bog. Localised surface trampling and contamination with lead, feed and droppings can occur
- Waste disposal - cut-over bogs have been used as designated waste disposal sites in the past and are frequently used for illegal dumping of agricultural and domestic waste.
- Pollution – contamination from adjacent landfill or agricultural drainage, fertiliser drift during its application, or localised dumping or fly-tipping, may be significant at certain sites
- Nutrient enrichment – nitrogen enrichment caused by atmospheric deposition could lead to significant vegetation changes, especially bryophyte and lichen interest. Any change to *Sphagnum* mosses in particular, would have wider implications for the whole bog.
- Planning developments – land reclamation for urban expansion, rural dwellings, energy infrastructure and development of the road network, may affect some Lowland raised bogs with long-term repercussions on the stability of the ecosystem
- Climate change – predictions of increased temperature and rainfall and the possibility of more extreme weather events could result changes to the climatic conditions required for formation, maintenance and restoration of lowland raised bog.

Favourable management of Lowland raised bog

Lowland raised bog should be protected and maintained where it occurs, and should be restored where its condition has declined. Some of our most important sites are protected through National and International legislation. In the wider countryside, lowland raised bog is protected from development and increased agricultural productivity through planning policies and legislation such as the Environmental Impact Assessment Regulations.

Lowland raised bog is a climax habitat which can generally be maintained indefinitely without agricultural management. However, in most areas unfavourable past management requires that more favourable management should be established.

Lowland raised bog is managed best with a prohibition on grazing and damage through peat-cutting. In areas where the Lowland raised bog has been damaged, such as by drainage or by peat-cutting, removing scrub and blocking drains to restore water levels, may be required.

In areas of cut-over Lowland raised bog with habitats such as fen, wet grassland or woodland, other management may be more applicable. This may include light grazing, woodland management, or the reduction of aerial nutrient enrichment or fire risk. It may require measures to address particular species such as Marsh Fritillary and breeding waders.

How do we determine the "health" or condition of Lowland raised bog?

The conservation status can be determined by the condition of the habitat. Favourable condition is defined by setting targets or target ranges for a series of different attributes. These are components or characteristics of the vegetation that are relatively easy to measure, but which are reliable indicators of the "health" of the habitat.

NIEA has developed Rapid Condition Assessments for several broad habitat types (grassland, moorland, woodland, coastal and wetlands). These will be made available online in the future. In the interim copies can be requested by contacting NIEA by E-mail: NIEA.EFSHigher@daera-ni.gov.uk.

Appendix 1: Lowland raised bog Indicator species

These indicators are for intact lowland raised bog and active cut-over lowland raised bog.

Positive Indicators:

Andromeda polifolia	Bog Rosemary
Calluna vulgaris	Heather
Cladonia spp.	Bushy lichens
Drosera spp.	Sundews
Erica tetralix	Cross Leaved-heath
Eriophorum angustifolium	Common Cottongrass
Eriophorum vaginatum	Hare's-tail Cottongrass
Menyanthes trifoliata	Bogbean
Narthecium ossifragum	Bog Asphodel
Rhynchospora alba	White-beaked Sedge
Sphagnum denticulatum	Cow-horn Bog-moss
Sphagnum capillifolium subsp. rubellum	Red Bog-moss
Sphagnum cuspidatum	Feathery Bog-moss
Sphagnum fuscum	Rusty Bog-moss
Sphagnum austinii	Austin's Bog-moss
Sphagnum magellanicum	Magellanic Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum pulchrum	Golden Bog-moss
Sphagnum tenellum	Soft Bog-moss
Trichophorum germanicum	Deergrass
Vaccinium oxycoccos	Cranberry

Negative Indicators:

Scrub/Trees
Agricultural weeds
Agricultural grasses

Appendix2: National Vegetation Classification codes

Lowland raised bog in Northern Ireland encompass a range of plant communities that broadly reflect a number of those communities described in the National Vegetation Classification (NVC) of Great Britain (Rodwell, 1991a) where descriptions and codes are given to associations of plants that are characteristic of particular environmental and management conditions.

In Northern Ireland, the four main NVC communities which make Lowland raised bog are:

- **M2 -** *Sphagnum cuspidatum/recurvum* bog pool community
- **M1-** *Sphagnum auriculatum* bog pool community
- **M17 –** *Scirpus cespitosus – Eriophorum vaginatum* blanket mire
- **M18 –** *Erica tetralix – Sphagnum papillosum* raised and blanket mire

A number of additional NVC communities are characteristic of lowland raised bog which has been subject to some disturbance such as drainage or peat-cutting. These include:

Mire communities

- **M15 –** *Scirpus cespitosus – Erica tetralix* wet heath
- **M20 –** *Eriophorum vaginatum* blanket and raised mire

Fen and swamp communities

A wide range of communities may be present

Grassland communities

- **M23** - Soft Rush *Juncus effusus /* Sharp-flowered Rush *Juncus acutiflorus* – Marsh Bedstraw *Galium palustre*
- **M25 –** *Molinia caerulea– Potentilla erecta mire*
- **MG10** - Yorkshire Fog *Holcus lanatus* – Soft Rush *Juncus effusus* rush pasture

Woodland communities

- **W4 –** *Betula pubescens – Molinia caerulea* Wet woodland