# European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

## Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the habitat:

**H91D0 - Bog woodland**

NORTHERN IRELAND

## IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this habitat, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this habitat is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was only relevant at UK-level (sections 10 Future prospects and 11 Conclusions).
- For technical reasons, the country-level future trends for Range, Area covered by habitat and Structure and functions are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

# Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

## NATIONAL LEVEL

### 1. General information

| | |
|---|---|
| 1.1 Member State | **UK (Northern Ireland information only)** |
| 1.2 Habitat code | **91D0 - Bog woodland** |

### 2. Maps

| | |
|---|---|
| 2.1 Year or period | 2013-2018 |
| 2.3 Distribution map | Yes |
| 2.3 Distribution map Method used | Complete survey or a statistically robust estimate |
| 2.4 Additional maps | No |

## BIOGEOGRAPHICAL LEVEL

### 3. Biogeographical and marine regions

| | |
|---|---|
| 3.1 Biogeographical or marine region where the habitat occurs | **Atlantic (ATL)** |
| 3.2 Sources of information | Cooper, A. & McCann, T. (2001). The Northern Ireland Countryside Survey 2000. Environment and Heritage Service, Belfast<br>Cooper, A., McCann, T. and Rogers, D. (2009) Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007. Northern Ireland Environment Agency. Northern Ireland Environment Agency Research and Development Series No. 09/06. Belfast. 58 pp.<br>McCann, T., Rogers, D. and Cooper, A. (2009) Northern Ireland Countryside Survey 2007: Field methods and technical manual. Northern Ireland Environment Agency. Northern Ireland Environment Agency, Research and Development Series No 09/07. Belfast.<br>Murray, R., McCann, T. and Cooper, A. (1992). A Land Classification and Landscape Ecological Study of Northern Ireland. Department of the Environment NI and Department of Environmental Studies, University of Ulster, Coleraine.<br>Rodwell, J.S. (1991). British Plant Communities. Volume 1, Woodlands. Cambridge: Cambridge University Press<br>NIEA. Internal Condition Assessment Reports (various sites and years).<br>Rodwell, J.S., Dring, J.C., Averis, A.B.V., Proctor, M.C.F., Malloch, A.J.C., Schaminee, J.H.J & Dargie, T.C.D. 1998. Review of Coverage of the National Vegetation Classification. Lancaster: Unit of Vegetation Science report to the Joint Nature Conservation Committee.<br>Data on aerial Nitrogen deposition taken from Air Pollution Information System website - http://www.apis.ac.uk/<br>NIEA. Internal Survey Reports (various sites and years).<br>Graham, T. (1975). Private Woodland Inventory of Northern Ireland. (1975). Forest Service, Belfast.<br>Forest Service woodland register - data available online https://www.daera-ni.gov.uk/articles/forest-service-woodland-register<br>McCracken, E. 1971. The Irish Woods Since Tudor Times: Their Distribution and Exploitation. Insititute of Irish Studies, Belfast.<br>Rackham, O. 1995 Looking for Ancient Woodland in Ireland in Woods, Trees and Forests in Ireland, pp. 1-12. Pilcher, J.R. and Mac an tSaoir, S. S. (eds). Royal Irish Academy, Dublin.<br>Rodwell, J. & Dring, J. 2001. European significance of British woodland types. English Nature Research Report No. 460 (Volumes 1-2). English Nature, |

# Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

Peterborough.

## 4. Range

| | | | |
|---|---|---|---|
| 4.1 Surface area (in km²) | | | |
| 4.2 Short-term trend Period | | | |
| 4.3 Short-term trend Direction | Stable (0) | | |
| 4.4 Short-term trend Magnitude | a) Minimum | b) Maximum | |
| 4.5 Short-term trend Method used | | | |
| 4.6 Long-term trend Period | | | |
| 4.7 Long-term trend Direction | | | |
| 4.8 Long-term trend Magnitude | a) Minimum | b) Maximum | |
| 4.9 Long-term trend Method used | | | |
| 4.10 Favourable reference range | a) Area (km²) | | |
| | b) Operator | | |
| | c) Unknown | No | |
| | d) Method | | |
| 4.11 Change and reason for change in surface area of range | No change | | |
| | The change is mainly due to: | | |
| 4.12 Additional information | | | |

## 5. Area covered by habitat

| | | | |
|---|---|---|---|
| 5.1 Year or period | 2013-2018 | | |
| 5.2 Surface area (in km²) | a) Minimum 0.15 | b) Maximum 0.25 | c) Best single value 0.2 |
| 5.3 Type of estimate | Best estimate | | |
| 5.4 Surface area Method used | Complete survey or a statistically robust estimate | | |
| 5.5 Short-term trend Period | 2007-2018 | | |
| 5.6 Short-term trend Direction | Stable (0) | | |
| 5.7 Short-term trend Magnitude | a) Minimum | b) Maximum | c) Confidence interval |
| 5.8 Short-term trend Method used | Complete survey or a statistically robust estimate | | |
| 5.9 Long-term trend Period | 1994-2018 | | |
| 5.10 Long-term trend Direction | Stable (0) | | |
| 5.11 Long-term trend Magnitude | a) Minimum | b) Maximum | c) Confidence interval |
| 5.12 Long-term trend Method used | Complete survey or a statistically robust estimate | | |
| 5.13 Favourable reference area | a) Area (km²) | | |
| | b) Operator | | |
| | c) Unknown | No | |
| | d) Method | | |
| 5.14 Change and reason for change in surface area of range | No change | | |
| | The change is mainly due to: | | |
| 5.15 Additional information | | | |

## 6. Structure and functions

# Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

| | | | | | |
|---|---|---|---|---|---|
| 6.1 Condition of habitat | a) Area in good condition (km²) | Minimum | 0.061 | Maximum | 0.061 |
| | b) Area in not-good condition (km²) | Minimum | 0.02 | Maximum | 0.02 |
| | c) Area where condition is not known (km²) | Minimum | 0.119 | Maximum | 0.119 |
| 6.2 Condition of habitat Method used | Based mainly on extrapolation from a limited amount of data | | | | |
| 6.3 Short-term trend of habitat area in good condition Period | 2007-2018 | | | | |
| 6.4 Short-term trend of habitat area in good condition Direction | Stable (0) | | | | |
| 6.5 Short-term trend of habitat area in good condition Method used | Complete survey or a statistically robust estimate | | | | |
| 6.6 Typical species | Has the list of typical species changed in comparison to the previous reporting period? | | No | | |
| 6.7 Typical species Method used | | | | | |
| 6.8 Additional information | | | | | |

## 7. Main pressures and threats

7.1 Characterisation of pressures/threats

| Pressure | Ranking |
|---|---|
| Agricultural activities generating air pollution (A27) | H |
| Waste management practices in agriculture (A24) | M |
| Other invasive alien species (other then species of Union concern) (I02) | H |
| Intensive grazing or overgrazing by livestock (A09) | M |
| Increases or changes in precipitation due to climate change (N03) | M |
| Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01) | M |
| Modification of hydrological flow (K04) | M |
| Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01) | M |
| Burning for agriculture (A11) | M |

| Threat | Ranking |
|---|---|
| Agricultural activities generating air pollution (A27) | H |
| Waste management practices in agriculture (A24) | M |
| Other invasive alien species (other then species of Union concern) (I02) | H |
| Intensive grazing or overgrazing by livestock (A09) | M |
| Increases or changes in precipitation due to climate change (N03) | H |
| Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01) | H |
| Modification of hydrological flow (K04) | M |

| | |
|---|---|
| Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01) | M |
| Burning for agriculture (A11) | M |

7.2 Sources of information

7.3 Additional information

## 8. Conservation measures

| | | |
|---|---|---|
| 8.1 Status of measures | a) Are measures needed? | Yes |
| | b) Indicate the status of measures | Measures identified and taken |
| 8.2 Main purpose of the measures taken | | Maintain the current range, population and/or habitat for the species |
| 8.3 Location of the measures taken | | Both inside and outside Natura 2000 |
| 8.4 Response to the measures | | Medium-term results (within the next two reporting periods, 2019-2030) |

8.5 List of main conservation measures

| |
|---|
| Management, control or eradication of other invasive alien species (CI03) |
| Implement climate change adaptation measures (CN02) |
| Reduce/eliminate air pollution from agricultural activities (CA12) |
| Adapt mowing, grazing and other equivalent agricultural activities (CA05) |
| Other measures related to agricultural practices (CA16) |
| Reduce impact of multi-purpose hydrological changes (CJ02) |

8.6 Additional information

## 9. Future prospects

9.1 Future prospects of parameters

a) Range

b) Area

c) Structure and functions

9.2 Additional information

## 10. Conclusions

10.1. Range

10.2. Area

10.3. Specific structure and functions (incl. typical species)

10.4. Future prospects

10.5 Overall assessment of Conservation Status

10.6 Overall trend in Conservation Status

10.7 Change and reasons for change in conservation status and conservation status trend

a) Overall assessment of conservation status

No change

The change is mainly due to:

| | |
|---|---|
| | b) Overall trend in conservation status |
| | No change |
| | The change is mainly due to: |
| 10.8 Additional information | |

## 11. Natura 2000 (pSCIs, SCIs, SACs) coverage for Annex I habitat types

| | |
|---|---|
| 11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region) | a) Minimum<br>b) Maximum<br>c) Best single value 0.081 |
| 11.2 Type of estimate | Best estimate |
| 11.3 Surface area of the habitat type inside the network Method used | Complete survey or a statistically robust estimate |
| 11.4 Short-term trend of habitat area in good condition within the network Direction | Stable (0) |
| 11.5 Short-term trend of habitat area in good condition within network Method used | Complete survey or a statistically robust estimate |
| 11.6 Additional information | |

## 12. Complementary information

| | |
|---|---|
| 12.1 Justification of % thresholds for trends | |
| 12.2 Other relevant information | |

# Distribution Map

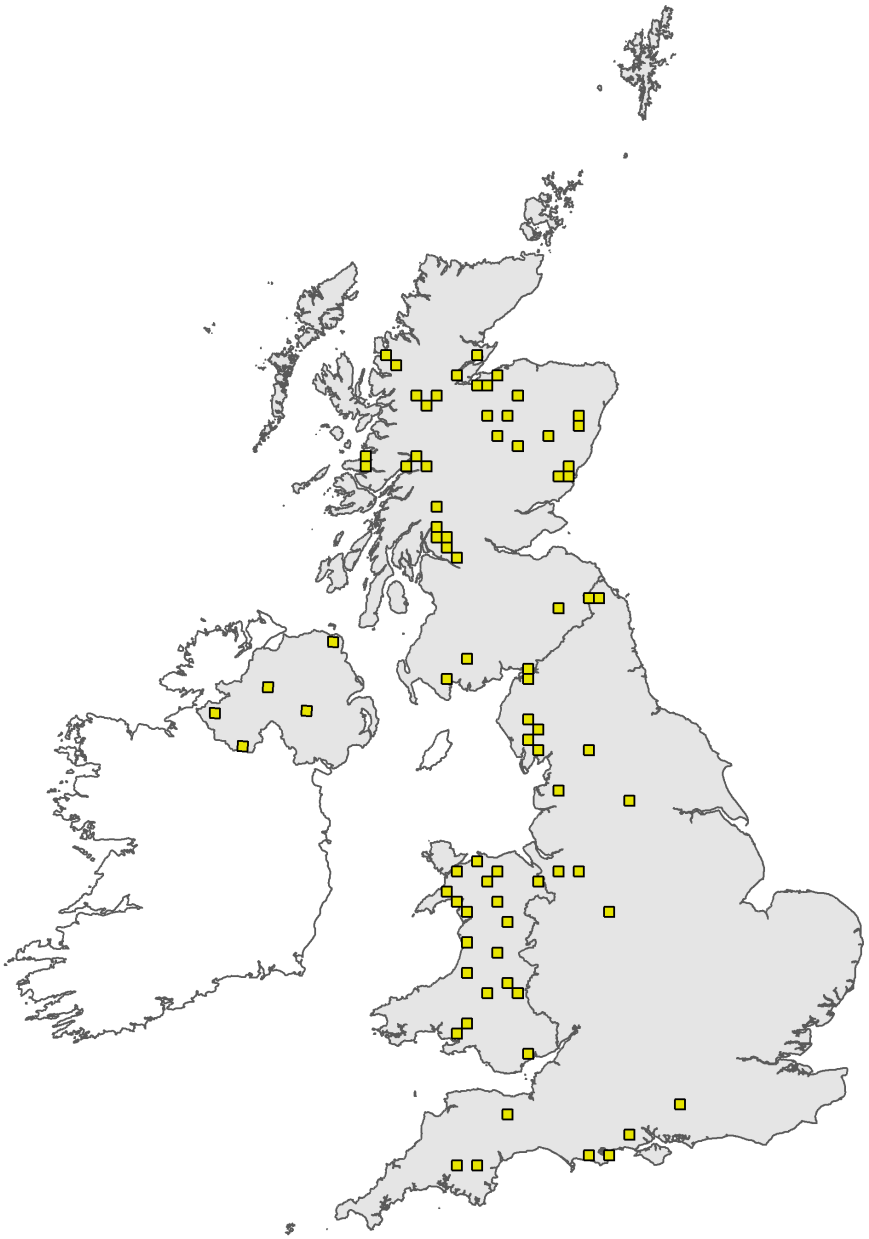

Figure 1: UK distribution map for H91D0 - Bog woodland. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available habitat records which are considered to be representative of the distribution within the current reporting period. For further details see the 2019 Article17 UK Approach document.

# Range Map

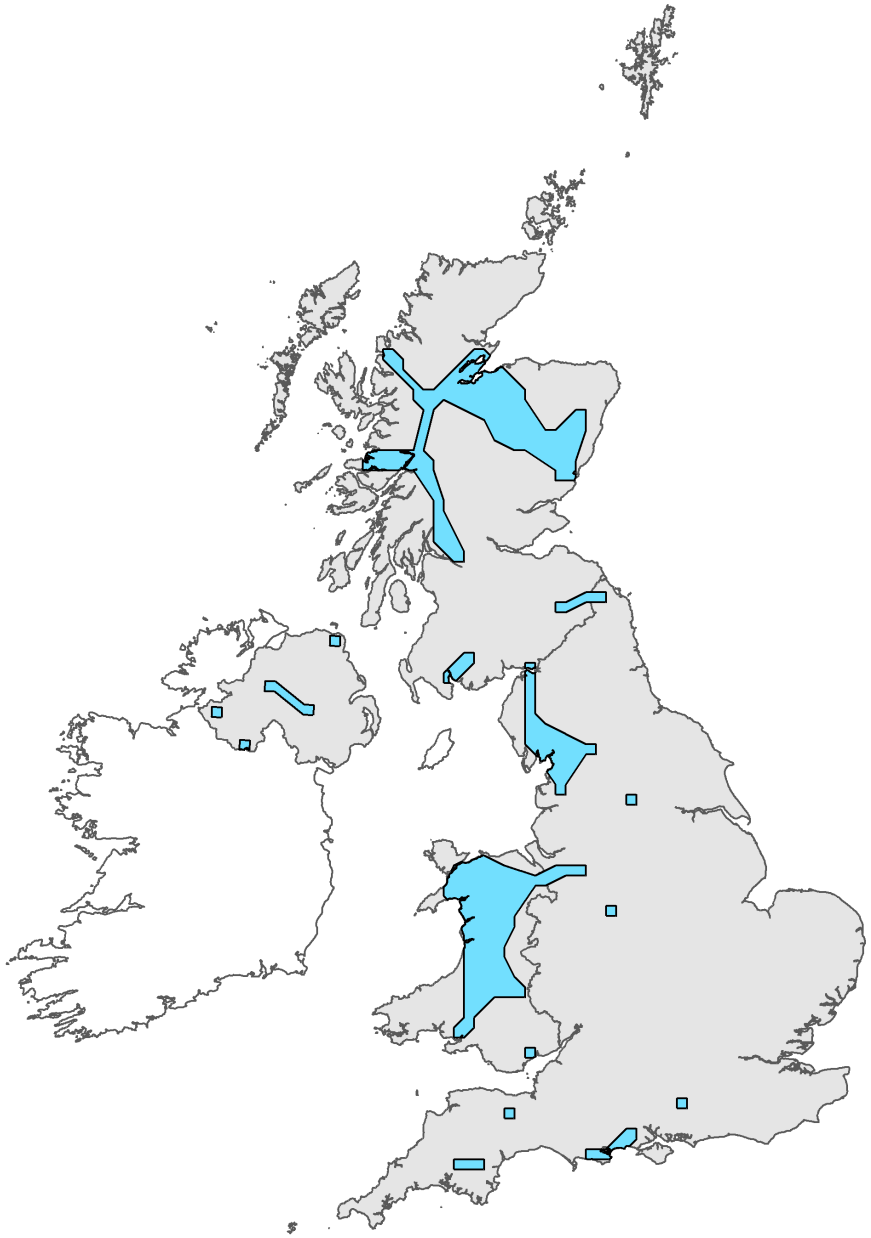

Figure 2: UK range map for H91D0 - Bog woodland. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this habitat was 25km. For further details see the 2019 Article 17 UK Approach document.

# Explanatory Notes

**Habitat code: 91D0**

| Field label | Note |
|---|---|
| 2.2 Distribution map | Under rare conditions in the UK, scattered trees can occur across the surface of a bog, in a relatively stable ecological relationship as open woodland, without the loss of bog species. This true Bog woodland is a much rarer habitat than the secondary colonisation of bogs by trees and shrubs following changes in the drainage pattern - which leads eventually to the loss of the bog community. The habitat type has not previously been well described in the UK, and consequently knowledge of its ecological characteristics is limited. Pine bog woodland types are likely to be intermediate in character between NVC type W18 Pinus sylvestris - Hylocomium splendens woodland and more open mire types such as M18 Erica tetralix - Sphagnum papillosum mire or M19 Calluna vulgaris - Eriophorum vaginatum blanket mire. The other variant, where birch or willow predominates, are likely to be closest to NVC type W4c Betula pubescens - Molinia caerulea woodland Sphagnum sub-community or, possibly, W2b Salix cinerea - Betula pubescens - Phragmites australis woodland Sphagnum sub-community. Examples of this unusual habitat type are found in areas of Scotland where summer drying may permit the establishment and growth of tree roots in the upper peat layers. The structure and function of this habitat type is finely balanced between tree growth and bog development. Tree growth, however, is always slow (or the trees would take over the bog); the trees are likely to be widely-spaced (because much of the surface area is too wet for them to establish), and dead trees may be common even among the fairly small individuals (because their weight depresses the peat locally leading to waterlogging and death). The principal tree species in this form of Bog woodland is Scots pine Pinus sylvestris. Although stunted in form these trees may be of considerable age, with the oldest individuals in bog woodland in Scotland estimated at 350 years old. The birch or willow bog woodland variant occurs in long-term stable combinations with bog vegetation. Very small fragments occur on New Forest valley bogs and on the fringes of some peat bogs and mere sites in hollows within oakwoods, and other examples in Scotland have developed on M17 Scirpus cespitosus - Eriophorum vaginatum blanket mire vegetation. In NI the habitat is limited to a few small stands, where naturally waterlogged acid waters dominated by Sphagnum spp have been colonised by an open canopy of Birch and Willows. Some of these occur as tiny fragments within Oakwoods; only one (at Peatlands Park) occurs more extensively on an acid basin that has developed over an old infilled lake (Schwingmoor-type situation). |
| 2.3 Distribution map; Method used | Map based upon fieldwork by NIEA staff at SACs and ASSIs. During the reporting period, NIEA staff have generally visited SACs and ASSIs Habitat in the wider countryside believed to be very rare. |

**Habitat code: 91D0 Region code: ATL**

| Field label | Note |
|---|---|
| 10.6 Overal trend in Conservation Status | see comments under 9.1 |
| 4.1 Surface area | Although survey work has covered the known areas of Bog Woodland in NI, the complete resource has not been surveyed. However, there is no reason to believe that there has been a loss in range; certainly no loss in range has been recorded in the habitat on SACs or ASSIs since the condition assessment programme was introduced in 2002, and the habitat is a very restricted one in terms of its required ecological parameters. |
| 4.5 Short term trend; Method used | Based upon regular condition monitoring of protected Bog Woodland sites. These cover the main sites that are known for the habitat in NI. |

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|---|---|
| 5.2 Surface area | Area of bog woodland has been estimated at 1174 ha - based on NI Countryside Survey data. The statistical analysis behind this was undertaken using a combination of field mapped parcels and a quadrat sampling programme. The overall estimate for NICS W47 - Bog woodland is 88.02 km2 (S.E. 30.87 km2). There were 45 (100m2) quadrats allocated proportional to area, and of which 6 were identified as 'active' using species composition i.e. cover of Sphagnum spp. Therefore: 8802ha x 6 / 45 = 1174ha. However, this refers to a much broader woodland type than H91D0 - and the figures are overwhelmingly dominated by secondary woodland growth on cutover bog - which is specifically excluded from the habitat definition. Given the fact that H91D0 is such a scarce type, we have decided to continue to use the estimate from the 2007 Report of 20 ha (range 15-25 ha). |
| 5.6 Short term trend; Direction | Short-term trend believed to be stable; during the period there was no evidence of loss from any SACs designated for the feature and all relevant sites were visited. |
| 5.8 Short term trend; Method used | Trend based upon survey of protected sites for the period 2012-2018. |
| 5.10 Long term trend; Direction | The Northern Ireland Countryside Survey (NICS) is a sample survey of Northern Ireland vegetation communities used to estimate the extent and distribution of broad habitats such as broad-leaved, semi-natural woodland, including oakwood (of which H91A0 is a subset). Repeat surveys are used to assess land-use change. The first phase in the process was A land classification and landscape ecological study of Northern Ireland carried out in 1988 (Murray et al, 1992). The NICS 2000 (Cooper & McCann, 2001) repeated the survey in 1998. NICS (2000) indicates an 9% increase in the extent of woodland and scrub between 1988 and 1998. This estimated increase of 11,211 ha is a result of tree planting, both broad-leaved and coniferous, and natural regeneration. Within this broad habitat, broad-leaved semi-natural woodland (which includes both oakwoods and mixed ashwoods, in addition to some wet woodlands) increased by 1,249 ha and now covers 1.7% (23,027 ha) of Northern Ireland (Cooper et al., 2002). This trend has accelerated, with an estimated increase of 28% in Broadleaved Mixed and Yew woodland between 1998 and 2007. Bog woodland is a tiny subset of this broad habitat, and it is not possible to provide a definitive estimate of long-term trend in area. However, given the overall increase in woodland during the period, it is likely that the area of H91D0 has remained stable since 1988. |
| 6.1 Condition of habitat | The known areas of Bog Woodland in NI have been designated as SAC. Beneficial management regimes have been put in place in some/parts of some sites specifically aimed at maintaining and enhancing the features for which they are designated, and to address some of the threats and pressures listed. Recent condition assessment data for the SACs that contain Bog Woodland as a selection feature show that much of the habitat is currently in favourable condition. |
| 6.2 Condition of habitat; Method used | Condition has been largely assessed from data taken from the most recent condition assessment on SACs that contain Bog Woodland. However, part of the resource lies outside the designated site network - and the condition is unknown. |

| | |
|---|---|
| 7.1 Characterisation of pressures/ threats | The main pressures and threats to Bog Woodland are similar to other woodland types - i.e. Grazing in woodland (including domestic livestock feral goats and deer); hydrological impacts; non-native invasive species; water pollution and insensitive forestry operations. In this particular woodland habitat, wildfires may be a risk where they adjoin areas of bogland where burning may take place accidentally or maliciously. Other important factors include Climate change, which is considered a major threat to the future condition of this habitat, especially in the long term. Although there is a high degree of uncertainty in defining future climate threats on habitats and species, the potential for increased periods of drought could upset the delicate water balance of this woodland type. Air pollution is also a major threat - the critical load for atmospheric Nitrogen for the habitat is estimated to be between 5-10 kg N/ha/year. All three SACs listed for the habitat are well above this level (i.e. Drumlea and Mullan Woods 24.22 kg N/ha/yr; Breen Wood 24.78 kg N/ha/yr; Peatlands Park 32.2 k N/ha/yr). |
| 7.2 Sources of information | Threats and pressures assessed from the most recent Common Standards Monitoring of the habitat at SACs, in addition to data from assessments of other woodland types, and the NI Countryside Survey. Threats based upon current pressures and expert judgement on future trends. |
| 7.2 Sources of information | Threats and pressures assessed from the most recent Common Standards Monitoring of the habitat at protected sites (SACs and ASSIs), in addition to data from the NI Countryside Survey and expert judgement to assess pressures in the wider countryside. Threats based upon current pressures and expert judgement on future trends. |
| 8.1 Status of measures | Recent monitoring shows that the habitat within SACs is largely in favourable condition. Management plans for some of the sites which contain the habitat are being prepared, and it is likely that measures will be put in place through several delivery mechanisms - e. g. direct management intervention on those woods that NIEA manages (such as Peatlands Park and Breen Woods SACs), the use of NIEA's Environment Fund and Management of Special Sites Scheme (MOSS) to encourage proactive management on other sites, and the Environmental Farming Scheme (EFS) administered by DAERA. |
| 8.2 Main purpose of the measures taken | Measures aimed at reducing damaging impacts from current pressures and future threats. The habitat is very limited in its extent and geographical distribution in NI. Hence this is reported as Maintain the structure and functions, including the status of typical species (related to 'Specific structure and functions'). |
| 8.3 Location of the measures taken | Management measures have been taken at a number of woodland sites containing the habitat (e.g. control of invasive alien species at Peatlands Park and Breen Wood SACs). In addition, Rural Development Plan (RDP) funds are being used to develop Conservation Management Plans at other SACs that may contain Bog Woodland. Other areas of Bog Woodland across NI - both within designated sites and outside - may be entered into the Environment Farming Scheme (EFS), which aims to implement sympathetic management. |
| 9.1 Future prospects of parameters | Although range and extent appear Favourable, and positive management measures are in place on designated sites, these potential improvements must be offset against the potential impacts of climate change, and in particular by the threat posed by continued atmospheric Nitrogen deposition. Hence an assessment for Structure and Function Future Prospects of Negative - slight/moderate deterioration. |
| 10.1 Range | In NI, although there have been huge historical woodland losses (as in the rest of Britain and Ireland) - generally to felling and conversion to agriculture - it is not believed that these have had any impact on the range of the Bog Woodland habitat in the recent past. It is naturally constrained by very narrow environmental factors. Available evidence from survey and monitoring work, suggests that the range has remained stable since 1988 and therefore assessed as Favourable. |

| | |
|---|---|
| 10.2 Area | Despite large historical losses in all woodland types, it is likely that the area of Bog Woodland in NI has not declined in extent since the Habitats Directive was adopted. The habitat is limited in distribution and extent by its very narrow range of environmental parameters. Hence extent judged to be Favourable. |
| 10.3 Specific structure and functions | The resource is reported as Unfavourable Inadequate for structure and function. Within the SAC network, the bulk of the habitat is in Favourable condition. However, outside the SAC network condition is largely unknown. |
| 10.4 Future prospects | Despite the protected sites network being largely Favourable and with conservation measures both already in place and planned for the future, the structure and function of the habitat is Unfavourable Inadequate. Future prospects are uncertain in the light of potential impacts from climate change, but the added potential impact of atmospheric Nitrogen deposition make this attribute Unfavourable Bad. |
| 10.5 Overall assessment of Conservation Status | Range and Extent are Favourable, with Structure and Function currently Unfavourable Inadequate. Future prospects are bad and unknown, with climate change impacts currently unpredictable and atmospheric Nitrogen deposition a major threat. Hence an overall bad assessment. |
| 11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network | There are 3 SACs for Bog Woodland in NI. These cover around 8 ha of the habitat. This represents a high proportion of the estimated extent of the habitat in NI. |
| 11.3 Surface area of the habitat type inside the network; Method used | Area estimates for SACs have been refined by field survey. CSM of SACs is undertaken on a regular basis and no recent loss in extent has been recorded. |
| 11.4 Short term trend of habitat area in good condition within the network; Direction | The assessment of stable is based upon recent condition assessment data, with the majority of the habitat in the SAC network reported as favourable. |
| 11.5 Short term trend of habitat area in good condition within the network; Method used | Assessment based upon recent condition assessment data. Note that a significant amount of the habitat in SACs is currently in favourable status, and management measures to tackle some of the pressures are in place at some of these sites. |