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:

H7140 - Transition mires and quaking bogs

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	**7140 - Transition mires and quaking bogs**

2. Maps

2.1 Year or period	2013-2018
2.3 Distribution map	Yes
2.3 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
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 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. 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. 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. Rodwell, J.S. (1991). British Plant Communities. Volume 2, Mires and heaths. Cambridge: Cambridge University Press NIEA. Internal Condition Assessment Reports (various sites and years). 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. Data on aerial Nitrogen deposition taken from Air Pollution Information System website - http://www.apis.ac.uk/ NIEA. Internal Condition Assessment Reports (various sites and years). NIEA. Fen Survey Of Counties Down and Armagh

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		

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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 d) Method	No	
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	b) Maximum	c) Best single value 0.5
5.3 Type of estimate	Best estimate		
5.4 Surface area Method used	Based mainly on expert opinion with very limited data		
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	Based mainly on extrapolation from a limited amount of data		
5.9 Long-term trend Period			
5.10 Long-term trend Direction	Unknown (x)		
5.11 Long-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.12 Long-term trend Method used			
5.13 Favourable reference area	a) Area (km²) b) Operator c) Unknown d) Method	No	
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

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum	0.23	Maximum	0.23
	b) Area in not-good condition (km²)	Minimum	0.192	Maximum	0.192
	c) Area where condition is not known (km²)	Minimum	0.078	Maximum	0.078
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	2013-2018				

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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	Based mainly on extrapolation from a limited amount of data
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
Extensive grazing or undergrazing by livestock (A10)	H
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H
Agricultural activities generating air pollution (A27)	H
Active abstractions from groundwater, surface water or mixed water for agriculture (A30)	M
Wind, wave and tidal power, including infrastructure (D01)	M
Droughts and decreases in precipitation due to climate change (N02)	H
Agricultural activities generating point source pollution to surface or ground waters (A25)	H
Drainage for use as agricultural land (A31)	M

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	H
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H
Agricultural activities generating air pollution (A27)	H
Active abstractions from groundwater, surface water or mixed water for agriculture (A30)	M
Wind, wave and tidal power, including infrastructure (D01)	M
Droughts and decreases in precipitation due to climate change (N02)	H
Agricultural activities generating point source pollution to surface or ground waters (A25)	H
Drainage for use as agricultural land (A31)	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

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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	

Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures (CA04)

Reduce/eliminate point pollution to surface or ground waters from agricultural activities (CA10)

Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)

Reduce/eliminate air pollution from agricultural activities (CA12)

Adapt/manage renewable energy installation, facilities and operation (CC03)

Manage drainage and irrigation operations and infrastructures in agriculture (CA15)

Implement climate change adaptation measures (CN02)

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

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

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)	a) Minimum b) Maximum c) Best single value	0.422
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

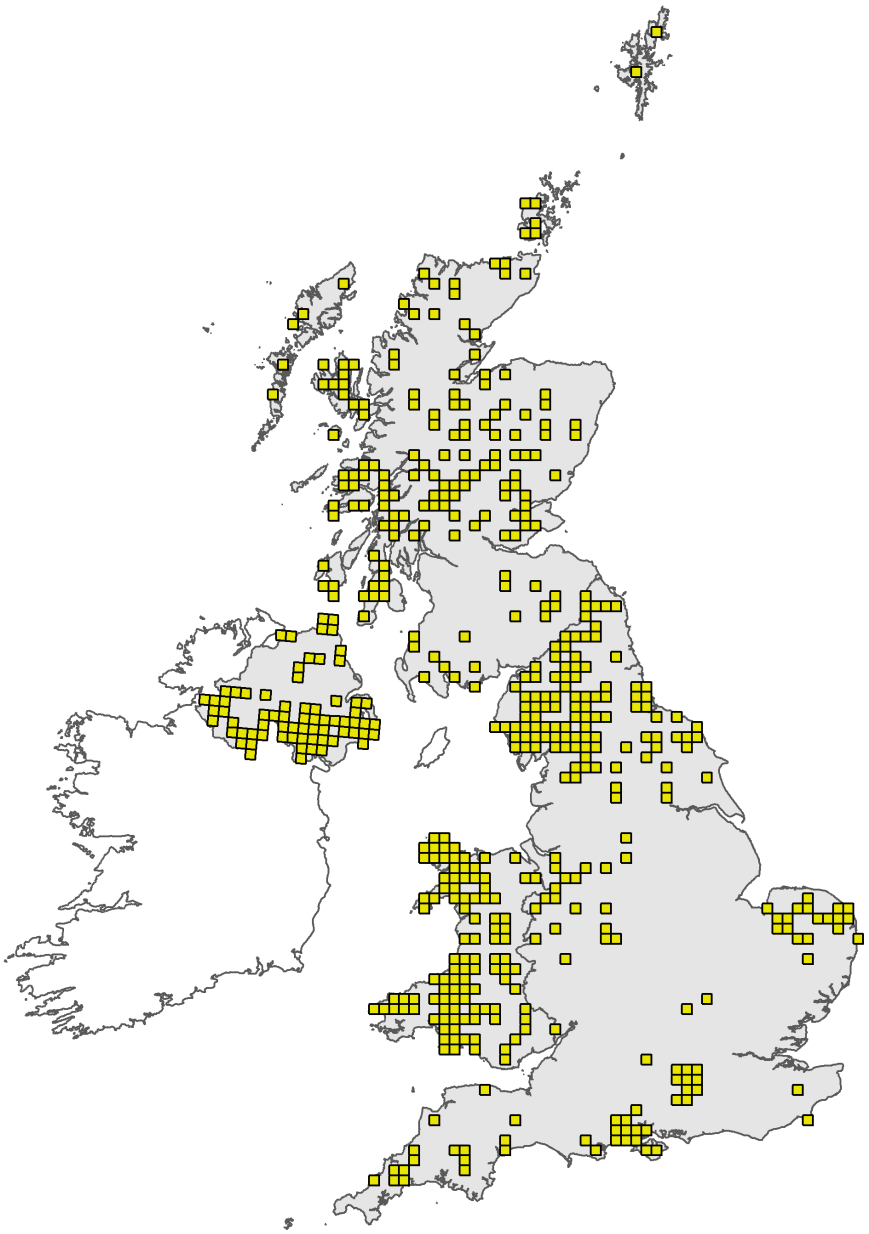

Figure 1: UK distribution map for H7140 - Transition mires and quaking bogs. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

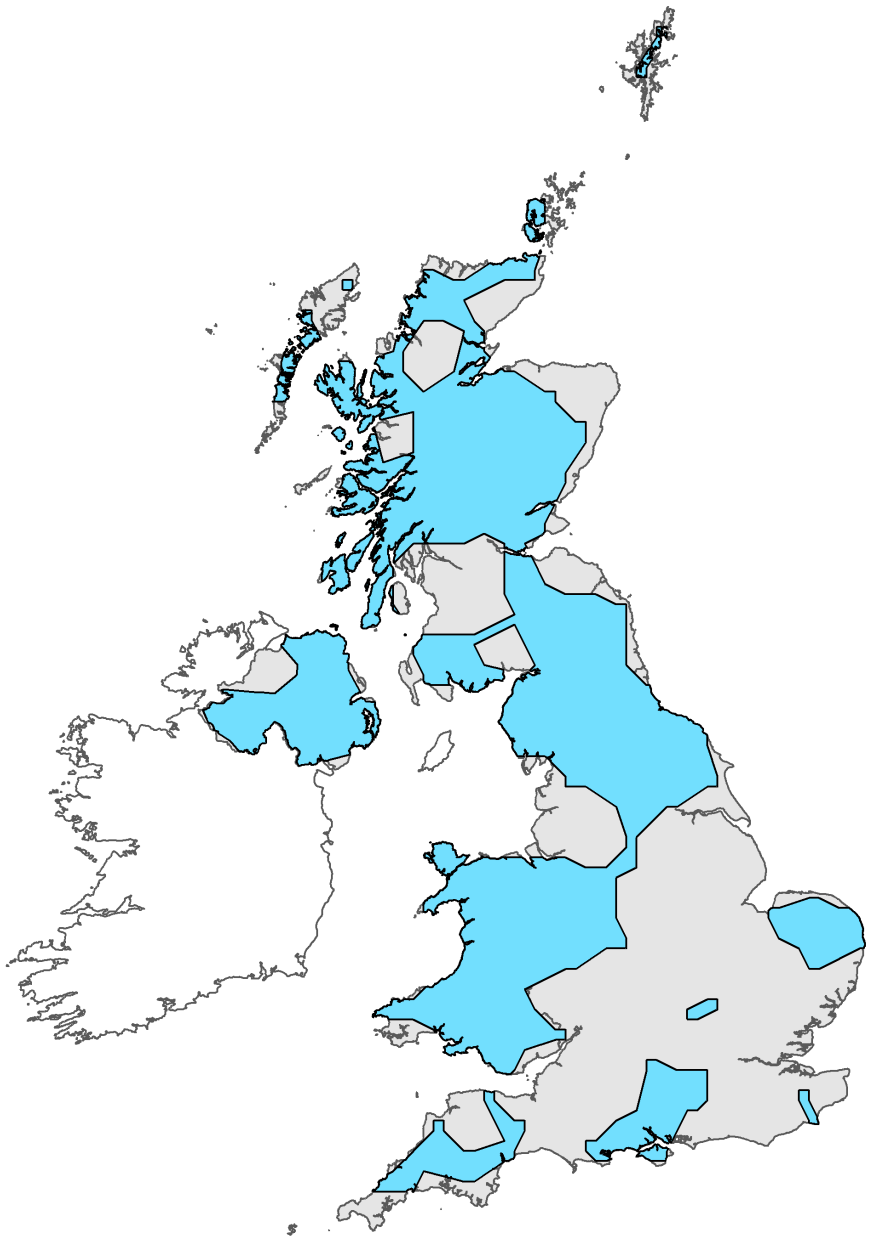

Figure 2: UK range map for H7140 - Transition mires and quaking bogs. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: 7140

Field label	Note
2.2 Distribution map	The term 'transition mire' relates to vegetation that in floristic composition and general ecological characteristics is transitional between acid bog and 7230 Alkaline fens, in which the surface conditions range from markedly acidic to slightly base-rich. The vegetation normally has intimate mixtures of species considered to be acidophile and others thought of as calciphile or basophile. In some cases the mire occupies a physically transitional location between bog and fen vegetation, as for example on the marginal lagg of raised bog or associated with certain valley and basin mires. In other cases these intermediate properties may reflect the actual process of succession, as peat accumulates in groundwater-fed fen or open water to produce rainwater-fed bog isolated from groundwater influence. Many of these systems are very unstable underfoot and can therefore also be described as 'quaking bogs'. Transition mires and quaking bogs can occur in a variety of situations, related to different geomorphological processes. Transition mires and quaking bogs are a widespread but local habitat type in the UK. It has a predominantly northern and western distribution and occurs in a wide range of hydromorphological contexts. The habitat is present in NI in a variety of locations, both in fen situations in the lowlands, and on blanket bog (the latter as areas of quaking mire within the blanket bog landscape). The habitat is not well recorded in NI, but the best examples of the base-rich/acid bog transition are represented at Derryleckagh and Turmennan SACs in Co Down. Garron Plateau SAC in Co Antrim is an upland example of quaking bog within an expanse of blanket bog. The habitat is also present on several ASSIs - one of the most notable examples being Kebble Marsh on Rathlin Island Co Antrim.
2.3 Distribution map; Method used	Much of the information on the distribution of the habitat comes from fen surveys undertaken by NIEA, either in-house or through contract (e.g. Fen Survey of Down and Armagh). During the reporting period, NIEA staff have generally visited SACs and ASSIs containing the habitat. Coverage of the habitat in the wider countryside is patchy, especially as separating transition mire from wider fen communities may be difficult.

Habitat code: 7140 Region code: ATL

Field label	Note
4.1 Surface area	No loss in range has been recorded in the habitat on SACs or ASSIs since the condition assessment programme was introduced in 2002. It is believed that the range has been unchanged since 1994.
4.5 Short term trend; Method used	Based upon regular condition monitoring of protected sites containing the habitat. Although there may have been some losses in habitat extent over the time period, it is believed that the range has been unchanged since 1994 - hence recorded as stable.
5.2 Surface area	The surface area of this habitat has been estimated very approximately at 50 ha. This is in the absence of any definitive data from outside the SAC series and the Kebble and Kinramer ASSI. Transition mire was not separated in the NI Countryside Survey from other - more extensive - fen communities, so there are no accurate estimates of its extent in the wider countryside, outside the protected sites network. The habitat occurs in both the lowlands and uplands. Given past fen survey work in Down, Armagh, Tyrone and Fermanagh, knowledge of the resource in the lowlands is more comprehensive than in the uplands, where the extent of the resource is not well-known.

5.4 Surface area; Method used	The habitat is regularly monitored on SACs and ASSIs, but with only very limited data from outside the protected sites network. Hence reported as Based mainly on extrapolation from a limited amount of data
5.6 Short term trend; Direction	Regular monitoring of protected sites has not noted any decline in extent of transition mire - or indeed the overall wetland area. Hence reported as Stable, but Based mainly on extrapolation from a limited amount of data.
5.10 Long term trend; Direction	The overall extent of the habitat is not known and although regular monitoring of protected sites has not noted any decline in extent of transition mire, over the longer time period it is impossible to indicate a trend - hence reported as unknown.
6.1 Condition of habitat	Data based upon condition assessment of the 3 SACs designated for the habitat. Results showed 23 ha Favourable (Garron Plateau) and 19.2 ha Unfavourable (Turmennan and Derryleckagh). The habitat is also present at a number of wetland ASSIs (notably Rathlin Island - Kebble and Kinramer), but it is not possible to provide a breakdown of condition by area for these sites, as the wetland communities have not been assessed separately.
6.2 Condition of habitat; Method used	Data based upon condition assessment of 3 SACs which include the habitat. The habitat is also present at c. 6-8 ASSIs and an unknown number of locations in the wider countryside. Hence Based mainly on extrapolation from a limited amount of data
7.1 Characterisation of pressures/ threats	This habitat is dependent upon a relatively delicate water balance (with elements of groundwater in close juxtaposition with rainwater-fed plant communities) and low levels of nutrient enrichment. In addition, the vegetation generally requires low-intensity management (such as grazing) to prevent encroachment by rank growth and scrub. In the past, there was significant loss of habitat extent through drainage and conversion to intensive agriculture, although it is believed that this is no longer a significant threat. Both over-grazing and particularly in more recent times, under-grazing have been recorded as reasons for adverse condition of H7140 in the SAC series. As in most wetland ecosystems, when combined with a lack of grazing, the effects of succession can lead to drying, scrub encroachment and succession to woodland, with subsequent loss of characteristic species. As Transition Mires are susceptible to agricultural run-off within their catchment area, eutrophication of water can result in substantial adverse changes to key plant communities. Some transition mires may be dependent upon groundwater for at least part of their water supply. In such cases, transition mires may be impacted by eutrophication of groundwaters, in addition to lowered water tables through water abstraction. With a critical load of 10-15 kg/N/ha/yr, the habitat is very sensitive to aerial Nitrogen deposition (predicted average for Derryleckagh 26.7 kg N/ha/yr; predicted average for Turmennan 22 kg N/ha/yr; predicted average for Garron Plateau 17 kg N/ha/yr) and the thresholds are exceeded at all SACs for the habitat. Hence, air pollution is considered to be a significant threat to the condition this habitat. In upland settings, the development of wind farms has the potential to disrupt water flows and impact the habitat. Climate change is still difficult to predict, but any tendency for precipitation to become more unpredictable - with extremes of drought and heavy rainfall - is likely to affect the delicate water balance that the habitat is dependent upon.
7.2 Sources of information	Threats and pressures assessed from the most recent Common Standards Monitoring of transition miress and similar wetland habitats 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 - particularly from the APIS website. Threats based upon current pressures and expert judgement on future trends.

8.1 Status of measures	Recent monitoring of transition mires on SACs and fen communities including this habitat on ASSIs has shown that the majority of the habitat is in unfavourable condition. Remedial management to improve the condition of the habitat has already been put in place at Turmennan SAC, and further measures at this and other sites will be put in place under the Interreg Va programme, and the Environmental Farming Scheme (EFS). In addition, the Department is developing a road map to reduce atmospheric Nitrogen from agricultural sources.
8.2 Main purpose of the measures taken	Measures aimed at reducing damaging impacts from current pressures - such as lack of management - and future threats. 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	The main pressures and threats to the habitat are in lowland settings, and the Interreg Va project will be developing conservation management plans and implementing management measures at Turmennan SAC, in addition to the upland blanket bog at Garron Plateau SAC. Rural Development Plan (RDP) funds are being used to develop similar Conservation Management Plans at other wetland SACs including Derryleckagh SAC. Several areas of fen across NI - both within designated sites and outside - have been entered into the Environment Farming Scheme (EFS), which aims to implement sympathetic management.
9.1 Future prospects of parameters	Future Prospects for Range and Area reported as Overall Stable. Recent monitoring on SACs and ASSIs has shown that much of the habitat is in unfavourable condition. Specific site conservation measures have been put in place at several SACs and ASSIs to improve condition, and further measures will be put in place under the Interreg Va programme and the Environmental Farming Scheme (EFS). However, much of the habitat is receiving levels of atmospheric deposition of Nitrogen that are above the critical thresholds. With a critical load of 10-15 kg/N/ha/yr, the habitat is very sensitive to aerial Nitrogen deposition (predicted average for Derryleckagh 26.7 kg N/ha/yr; predicted average for Turmennan 22 kg N/ha/yr; predicted average for Garron Plateau 17 kg N/ha/yr) and the thresholds are exceeded at all SACs for the habitat. Hence, air pollution is considered to be a significant threat to the condition this habitat. Although the Department is developing a road map to reduce atmospheric Nitrogen from agricultural sources, until this initiative is implemented and its impacts evaluated, advice from JNCC is that the assessment of future prospects for Structure and Function should be assessed as Negative.
10.1 Range	Within NI there have been large historic losses in extent of wetland habitats in which Transition Mire occurs, but there are no indications that the range of these habitats has declined since 1988 - hence Range assessment for H7140 is Favourable.
10.2 Area	As 10.1 - Within NI there have been large historic losses in extent of wetland habitats in which Transition Mire occurs; based upon monitoring of protected sites, there are no indications that the extent of this habitat has declined since 1988, but the resource has not been fully surveyed across NI, particularly in the uplands. Hence the judgement is Unknown.
10.3 Specific structure and functions	CSM data for SACs in NI suggest that around half of the area of Transition Mire is unfavourable, with a pronounced difference between lowland and upland examples. In the absence of any accurate estimate of the total area of the habitat in NI, we believe that this is representative of the overall NI resource. This suggests a judgement of Unfavourable - Bad for the structure and function parameter for H7140.
10.4 Future prospects	There are concerns about the current condition of the habitat, particularly in the lowlands, largely as a result of lack of grazing. It is proving difficult to restore appropriate management to this habitat. Given the uncertain future impacts of air pollution and climate change, future prospects are predicted as Unfavourable Bad.

10.5 Overall assessment of Conservation Status	Range is Favourable. Extent has been assessed as Unknown. Structure and function is Unfavourable Bad, based on largely upon lack of management and hydrological issues. Future prospects are Unfavourable Bad, with climate change impacts currently unpredictable and atmospheric Nitrogen deposition still a major threat. Hence an overall Unfavourable Bad assessment.
11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	The habitat is represented at 3 SACs in NI - lowland examples occur at Derryleckagh (16.6 ha) and Turmennan (4.6 ha) in Co Down. An upland example is present at Garron Plateau (23 ha) in Co Antrim.
11.3 Surface area of the habitat type inside the network; Method used	The habitat has been mapped on the 2 lowland SACs. The largest area of the habitat has been mapped on the Garron Plateau SAC, although it is possible that smaller areas of the habitat occur elsewhere. Reported as Complete survey.
11.4 Short term trend of habitat area in good condition within the network; Direction	Assessment of stable based upon recent condition assessment data for the habitat on SACs, which has not changed since the previous assessments. Again, it should be noted that the Condition Assessment methodology is generally not sensitive in detecting the impacts of atmospheric Nitrogen deposition on the habitat.
11.5 Short term trend of habitat area in good condition within the network; Method used	Assessment based upon recent condition assessment data from the 3 SACs. There is a significant difference in condition bwteen upland (largely favourable) and lowland examples (largely unfavourable). It should be noted, however, that the Condition Assessment methodology is generally not sensitive in detecting the impacts of atmospheric Nitrogen deposition.