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

WALES

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 (Wales information only)**
1.2 Habitat code	**7140 - Transition mires and quaking bogs**

2. Maps

2.1 Year or period	1987-2012
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	Birch, K.S. (in prep.). Lowland Peat Survey Site Report for SH64/27P Llyn Hafod-y-llyn. Natural Resources Wales, Bangor Bosanquet, S.D.S. (2013). Lowland Peat Survey Site Report for SH61/14P Cors Gregennan. Natural Resources Wales, Bangor. Bosanquet, S.D.S. (2015). Lowland Peat Survey Site Report for SH61/14aP Llynnau Cregennan. Natural Resources Wales, Bangor. Drewett, D. (2012). Colwyn Brook Marches SSSI: Features Monitoring Report, September 2012. Natural Resources Wales. Gilman, K., Meade, R., Wheeler, B.D. & Shaw, S.C. (2008). Assessment of options for achieving nutrient reduction and hydrological control objectives at Crymlyn Bog, South Wales. Countryside Council for Wales Regional Report CCW/WW/09/10. Guest, D. 2012. Assessing N deposition as a pressure for Article 17 reporting on habitats. CCW HQ internal document. JNCC (2018). Nitrogen exceedance of Annex I habitats in SACs. Excel spreadsheet provided 29 May 2018. Jones, P.S., Bosanquet, S.D.S. (2010). Lowland Peat Survey Site Report for SH38/06P Salbri. Countryside Council for Wales / Natural Resources Wales, Bangor. Jones, P.S., Bosanquet, S.D.S., Reed, D.K., Birch, K.S., Stevens, J. & Turner, A.J. (2011). The habitat composition and conservation of Welsh lowland mires: preliminary results from the Lowland Peatland Survey of Wales. In: Proceedings of a Memorial Conference for Dr David Paul Stevens 1958-2007: Grassland Ecologist and Conservationist. Eds: Blackstock, T.H., Howe, E.A., Rothwell, J.P., Duigan, C.A & Jones, P.S. pp. 103-115. CCW Staff Science Report 10/03/05, Countryside Council for Wales, Bangor. Jones, P.S., Stevens, J., Bosanquet, S.D.S., Turner, A.J., Birch, K.S. & Reed, D.K. (2012). Distribution, extent and status of Annex I wetland habitats in Wales: supporting material for the 2013 Article 17 assessment. Countryside Council for Wales, Bangor. Kay, L. (2018). N deposition extent of exceedance of CL for article 17 all habitats 2018, Excel s/s/. Natural Resources Wales, Bangor. Lovering, T. (undated). Transition Mire (at Cors Caron - results of monitoring in October 2003). Unpublished CCW Document.

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

Milner, R. (2018). H7140_area_results_R-Millner_final. Excel s/s. Natural Resources Wales, Bangor.
NRW (2016). N2K Wales LIFE Natura 2000 Programme for Wales (LIFE11 NAT/UK/000385). FINAL Report Covering the project activities from 01/09/2012 to 30/09/2015. Report to the EU, NRW, Bangor.
NRW (2018a). SAC and SPA Monitoring Programme Results 2013-2018. Internal NRW Dataset (Excel spreadsheet).
NRW (2018b). SAC & SPA Monitoring Programme planning spreadsheet 2013 - 2018. Internal NRW Dataset (Excel spreadsheet).
NRW (2018c). Actions Database. Internal NRW Database.
Reed, D.K. (2011). Lowland Peat Survey Site Report for SN66/50P Comins Pen-y-banc. Countryside Council for Wales / Natural Resources Wales, Bangor
Sherry, J. (2007). Lowland Heathland in Wales - A review and assessment of National Vegetation Classification Survey Data 1993-2002. Countryside Council for Wales Staff Science Report No. 07/3/1. CCW, Bangor.
Stevens, D.P., Smith, S.L.N., Blackstock, T.H., Bosanquet, S.D.S. & Stevens, J.P. (2010). Grassland of Wales: A survey of lowland species-rich grasslands, 1987 - 2004. University of Wales Press, Cardiff.
Stevens, J. (2012a). GIS layer - data processing notes - A17 reporting 2012 H7140. Internal file note, Countryside Council for Wales.
Stevens, J. (2012b). Art17 2012 H7140 Transition mires.lyr. ARC GIS Data layer.

4. Range

4.1 Surface area (in km²)			
4.2 Short-term trend Period			
4.3 Short-term trend Direction	Unknown (x)		
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	1987-2012			
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value	3.38
5.3 Type of estimate	Minimum			
5.4 Surface area Method used	Based mainly on extrapolation from a limited amount of data			
5.5 Short-term trend Period	2007-2018			
5.6 Short-term trend Direction	Unknown (x)			

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

5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.8 Short-term trend Method used	Insufficient or no data available		
5.9 Long-term trend Period	1994-2018		
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	Insufficient or no data available		
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

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum	0.858	Maximum	0.858
	b) Area in not-good condition (km²)	Minimum	1.57	Maximum	1.57
	c) Area where condition is not known (km²)	Minimum	0.95	Maximum	0.95
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	Unknown (x)				
6.5 Short-term trend of habitat area in good condition Method used	Insufficient or no data available				
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
Abandonment of management/use of other agricultural and agroforestry systems (all except grassland) (A07)	H
Problematic native species (I04)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Drainage (K02)	H

Agricultural activities generating diffuse pollution to surface or ground waters (A26)	M
Agricultural activities generating point source pollution to surface or ground waters (A25)	M
Deposition and treatment of waste/garbage from household/recreational facilities (F09)	M
Plants, contaminated or abandoned industrial sites generating pollution to surface or ground water (F13)	M

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	H
Abandonment of management/use of other agricultural and agroforestry systems (all except grassland) (A07)	H
Problematic native species (I04)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Drainage (K02)	H
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	M
Agricultural activities generating point source pollution to surface or ground waters (A25)	M
Deposition and treatment of waste/garbage from household/recreational facilities (F09)	M
Plants, contaminated or abandoned industrial sites generating pollution to surface or ground water (F13)	M
Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F01)	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, but none yet taken

8.2 Main purpose of the measures taken

8.3 Location of the measures taken

8.4 Response to the measures

8.5 List of main conservation measures

Maintain existing extensive agricultural practices and agricultural landscape features (CA03)
Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Restore habitats impacted by multi-purpose hydrological changes (CJ03)
Manage drainage and irrigation operations and infrastructures in agriculture (CA15)
Reduce impact of mixed source pollution (CJ01)

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

Management of habitats (others than agriculture and forest) to slow, stop or reverse natural processes (CL01)

DO NOT USE Management, control or eradication of other alien species (CI04)

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

Reduce/eliminate air pollution from agricultural activities (CA12)

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 b) Maximum c) Best single value 1.17
11.2 Type of estimate	Best estimate
11.3 Surface area of the habitat type inside the network Method used	Based mainly on extrapolation from a limited amount of data
11.4 Short-term trend of habitat area in good condition within the network Direction	Unknown (x)
11.5 Short-term trend of habitat area in good condition within network Method used	Based mainly on expert opinion with very limited data

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

11.6 Additional information

12. Complementary information

12.1 Justification of % thresholds for trends

12.2 Other relevant information

Distribution Map

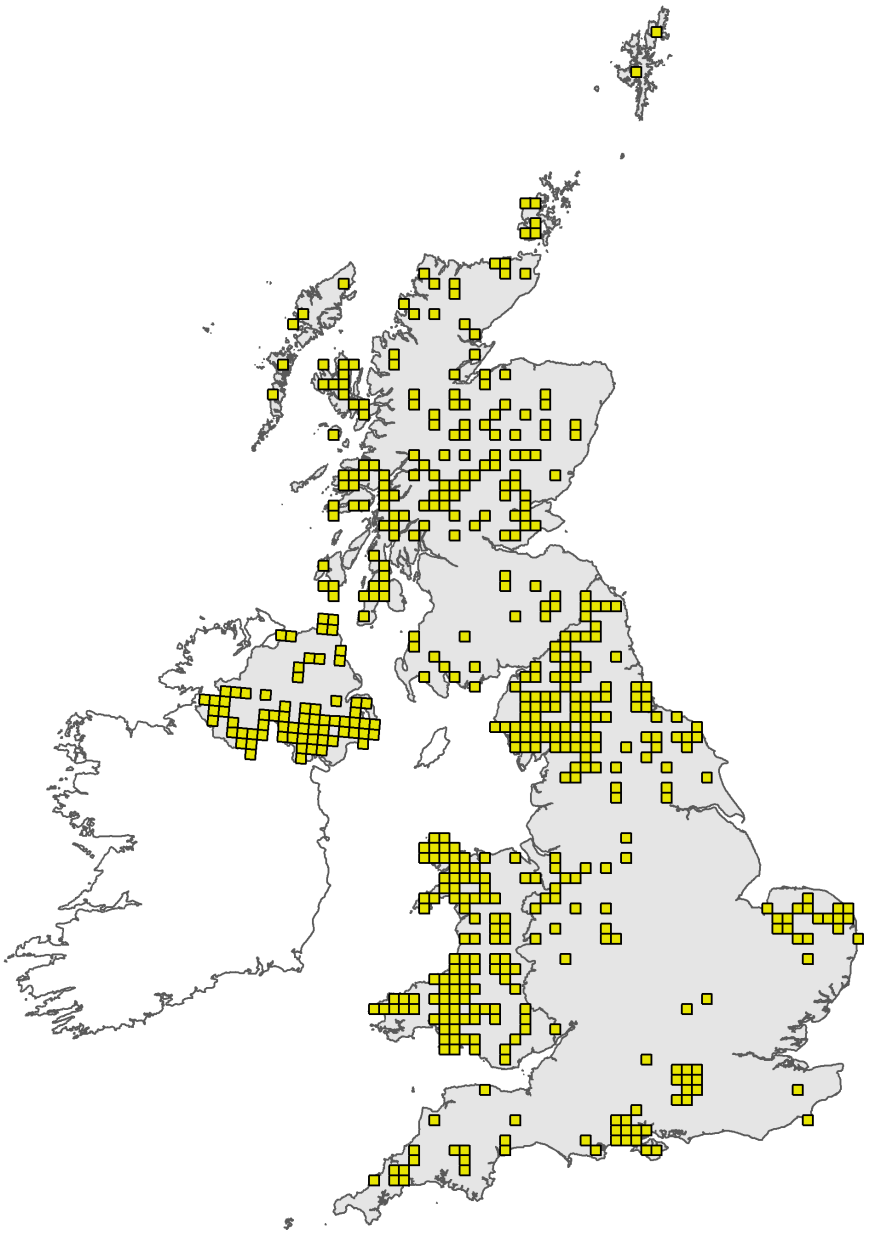

Figure 1: UK distribution map for H7140 - Transition mires and quaking bogs. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

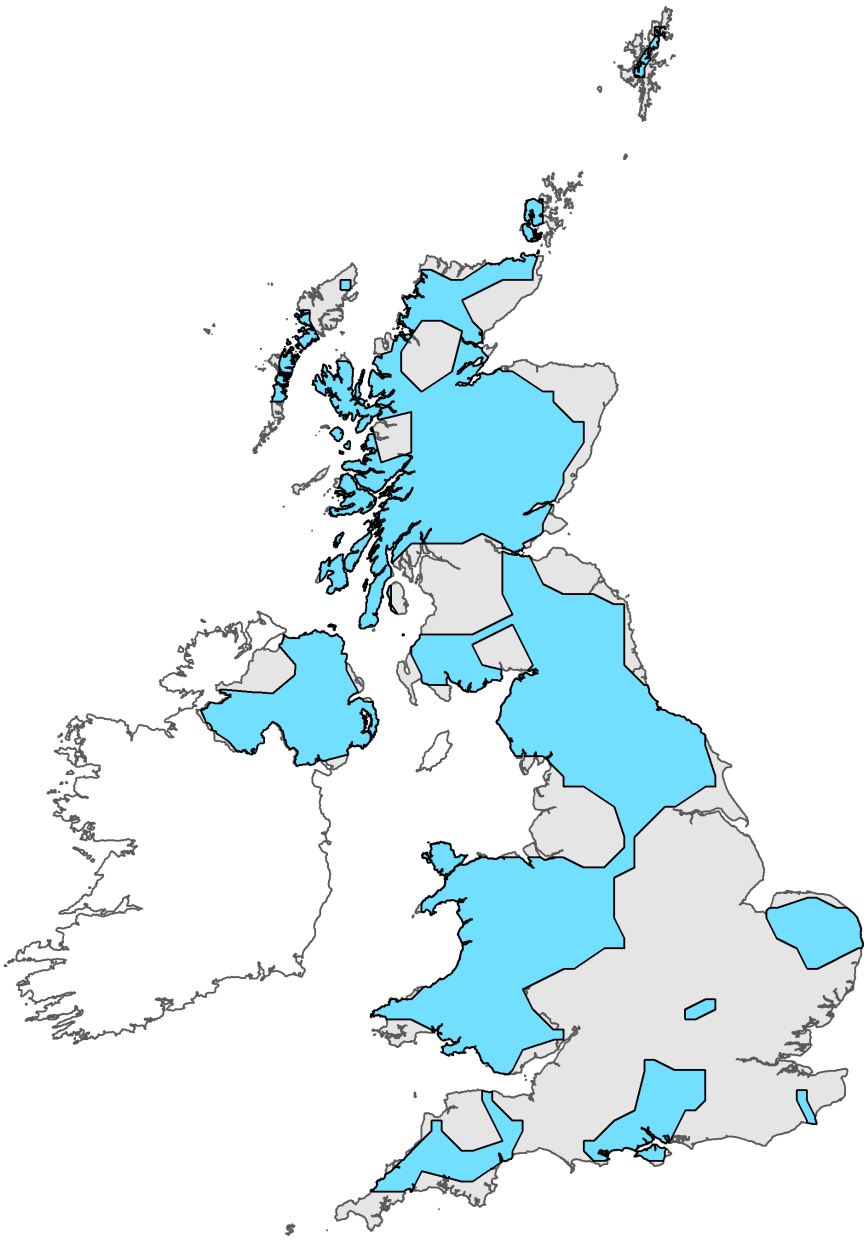

Figure 2: UK range map for H7140 - Transition mires and quaking bogs. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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
2.3 Distribution map; Method used	The distribution map provided for this habitat is the same as that used for the 2013 Article 17 reporting round (Stevens, 2012a) - this was a new map prepared for the 2013 Article 17 reporting round. The definition of this habitat is described in outline in the Habitat Statement and considered in more detail in Stevens (2012a) and Jones et al (2012). There are 103 hectad records for this habitat based on the 2013 assessment and this is likely to give a fair overall impression of the distribution of this habitat in Wales, though further survey would fill in gaps and may extend the overall range. Inclusion of data collected since 2013 has not been possible for this round, but these data include important Welsh sites for H7140, including Cors Gregennen & Llynnau Cregennen (SH61, Bosanquet [2013,2015]) and Llyn Hafod-y-llyn (SH64, Birch in prep.). The distribution map is based on GIS analysis of Phase 2 (plant community level) data. Phase 1 data is of limited use for this habitat because its recognition relies on specific floristic information which unless covered by a target note would not be reflected in the habitat mapping categories employed by Phase 1. Phase 2 mapping yields polygon records assigned to NVC communities/sub-communities and non-NVC units mapped to 1:2500 and transferred to a Mapinfo and then subsequently an ArcGIS platform. Polygons (whether relating to individual vegetation types or mosaics) and some point records for plant communities/sub-communities judged as conforming to this habitat have been selected and used to create a GIS inventory for this habitat. Plant communities judged as conforming to this include M2, M4, M5, M8, M9, M15, M17-M21, M29, M30, S27 and several non-NVC types, with the contexts in which they apply described by Jones et al (2012). A total of 12,259 polygon records for this habitat have been used to create the distribution map, with (in decreasing order of number of records) 10,819 records coming from the Lowland Peatland Survey of Wales (2004 to current - , see Jones et al., 2011), 817 from the Lowland Grassland Survey of Wales (1987-2004 - see Stevens et al., 2010), 448 from the survey of Mynydd Preseli undertaken by the Lowland Peatland Survey team between 2004 and 2005, 132 from Phase 2 upland surveys of Bwlch Corog, Carneddau extensions, Eastern Carneddau, Elenydd, Glydeiriau, Glyder extensions, Rhinog and the Western Carneddau, and finally from the Lowland Heathland Survey of Wales (1993-2001 - see Sherry, 2007). No point records for this habitat are included in the distribution map.

Habitat code: 7140 Region code: ATL

Field label	Note
4.3 Short term trend; Direction	Changes to the 10km square distribution and linked range of H7140 in Wales are considered relatively unlikely to have occurred, requiring either the loss of all examples of the habitat in a given hectad or its creation/re-establishment in a square where it was previously absent. However, the relatively fragmentary distribution of the habitat in many areas make it relatively sensitive to range changes and in the absence comprehensive surveillance data, the short-term range trend is considered unknown.
4.11 Change and reason for change in surface area of range	The distribution data submitted in 2013 has not been updated. Changes in surface area or range may actually have occurred since the last reporting period, but NRW has no system in place for monitoring or recording such changes.

5.1 Year or period	The extent estimate for H7140 is based on the GIS inventory developed by Stevens (2012b) and described under section 4 above - this amounts to 336.11 ha. All data were collected between 1987 and 2012 and re-interpreted in 2012 to produce a GIS Inventory. Data for 69.9% of the area (234.8 ha) date from 2004 or later as a result of survey by the Lowland Peatland Survey of Wales. Formal condition monitoring of SAC's supporting H7140 as a habitat feature has only been undertaken on one site to-date since 2012 (Rhos Goch - see NRW 2018a) but is planned for three other sites in 2018 (NRW, 2018b) - thus the continued presence of the habitat has only been assessed formally at one site. An additional 2 ha has been added to the extent data site based on site condition monitoring at Colwyn Brook Marshes SSSI (Drewett, 2012).
5.2 Surface area	Inevitable uncertainty surrounds the extent estimate of 3.38 km2 -this is due to the following issues: 1. Extent data for several of the SAC sites supporting this habitat as a C/D graded feature have not been included - these include the Y Berwyn and Cors Caron SACs. The distribution map may not record all occurrences of H7140 on these sites. Lovering (undated) suggests that the core area of transition mire at Cors Caron may only amount to 0.35 ha - this is much less than the N2K data form figure. 2. The extent figure above excludes a number of known locations for H7150 surveyed since the last reporting round. There are likely to be sites which still support H7150 which remain un-surveyed. 3. Some of the extent data for this habitat date from surveys undertaken over 20 years ago. Revisits to these sites are required to determine any changes in extent and their causation. For these reasons the extent estimate of 3.38 km2 has to be regarded as a minimum figure. A wide range of plant communities are regarded as conforming to this habitat in Wales (many assignments are context dependent) and the GIS inventory of Stevens (2012b) records the following ha totals for communities/groups of communities: - M15 (including M15, M15a, M15b, M15d, M15b/d, M15 'swampy variant') 25.3 ha; - M17 (including M17, M17 species-poor, M17 Sphagnum fallax variant, M17a, M17a Carex rostrata variant, M17a Sphagnum fallax variant, M17a/c, M17a/c Sphagnum cuspidatum variant, M17c, M17c Carex rostrata variantM17c Sphagnum fallax variant) 11.2 ha; - M18 (including M18a, M18a Sphagnum fallax variant, M18b) 0.5 ha; - M21 (including M21, M21 'swampy variant', M21a, M21b, M21b Polytrichum commune variant, M21b 'swampy variant') 44.6 ha; - M2 (including M2, M2a, M2a/b, M2b, M2b Eriophorum vaginatum variant, M2b Sphagnum riparium variant, M2b 'swampy variant') 9.4 ha; - M29 (including M29, M29 Carex rostrata variant, M29 Menyanthes trifoliata, M29 Myrica gale) 19.1 ha; - M30 (including M30, M30 Carex rostrata variant) 1.6 ha; - M4 (including M4, M4 Equisetum fluviatile variant, M4 Eriophorum vaginatum variant) 25.5 ha; - M5 (including M5, M5 Equisetum fluviatile variant, M5 Sphagnum contortum variant, M5 Sphagnum innundatum variant) 16 ha; - M8 (including M8, M8a) 0.14 ha; - M9 (including M9, M9a, M9b, M9/S27) 7.3 ha; - Menyanthes - Narthecium vegetation 0.18 ha; - Mosaics including TMQB communities 33.7 ha; - Mosaic with M21b 1.3 ha; - Narthecium dominated vegetation 0.26 ha; - Nodum 19 vegetation - all forms 72 ha; - Potentilla palustris - Menyanthes trifoliata mire 0.05 ha; - Potentilla palustris - Sphagnum mire 0.94 ha; - S27 all forms 59.1 ha; - Species-rich Carex rostrata mire 7.9 ha; - Potentilla palustris - Sphagnum mire 0.06 ha. The significant floristic range of these communities highlights the need for accurate survey information in characterising the resource and thus understanding its management requirements and providing a guide to objective setting and monitoring. The significance of non-NVC units is also noteworthy, with units at the level of communities alone (and thus excluding non-NVC variants) amounting to 81.2 ha (24% of the resource); this highlights the need for the ongoing development of the NVC.
5.6 Short term trend; Direction	There is no quantitative evidence on which to assess changes in range or surface area over the short or long term.

5.14 Change and reason for change in surface area	The assessment of 'no' is based on use of the 2012 data with no inclusion of recent survey data coupled with lack of evidence of genuine change due to lack of a system for monitoring and recording changes in the extent of Annex 1 habitats.
6.1 Condition of habitat	The figure of 'Good' is based on SAC Condition Monitoring for the 0.35 ha of this feature estimated to be within the Cors Caron SAC (Lovering, Undated) and 85.4 ha of this habitat assessed as favourable during the 2012/13 reporting round (Jones et al., 2012) on sites surveyed by the Lowland Peatland Survey (and excluding data for any sites included in the SAC analysis above): this assessment was a subjective judgement based on the experience of the surveyors. The figure of 'Not good' is the total extent of this habitat on the five SACs for which reliable extent data are available from the GIS inventory described above and for which SAC monitoring data is available from the second or third reporting rounds with a judgement of unfavourable recorded: these sites are (with data in brackets indicating the feature grade, the extent of the feature from Phase 2 survey, and the most recent reporting assessment) Corsydd Eifionydd (B feature, 20.5 ha, 2012), Cors Crymlyn (B, 24.96 ha, 2012), Gweunydd Blaencleddau (C, 4.28, 2012), North West Pembrokeshire Commons (B, 9.87, 2012), and Rhosgoch (B, 7.09, 2015). For the purpose of this assessment it is assumed that this condition judgement relates to the whole resource on each site, which totals 66.7 ha. The not good figure also includes the 2 ha of H7140 noted at Colwyn Brook Marches SSSI as being in unfavourable condition (Drewett, 2012), making 68.7 ha in total. The final component of the Not Good figure is the 88.5 ha of H7140 assessed as unfavourable during the 2012/13 reporting round (Jones et al., 2012) on sites surveyed by the Lowland Peatland Survey (and excluding data for any sites included in the SAC analysis above): this assessment was a subjective judgement based on the experience of the surveyors. This makes a total of 157.2 ha of habitat assessed as 'Not good'. The area assessed as 'unknown' (95 ha) is the difference between the total area noted under 5 above and the area assessed as in 'Not Good' and 'Good' condition.
6.2 Condition of habitat; Method used	Assessment of structure and function within SACs is based on the results of common standards monitoring visits undertaken between 2009 and 2012 (NRW, 2018a). The spreadsheet cited as NRW (2018a) has been analysed to extract monitoring data for SAC sites for the Transition Mire feature (global grades C-B). The related spreadsheet NRW (2018b) has then been checked to see if any monitoring results have been reported which do not figure in NRW (2018a). The assessments from the Lowland Peatland Survey of Wales (Jones et al., 2012) are subjective assessments based on the experience of the surveyors who assessed the H7140 feature at each site. These data are based wholly on the 2012/13 assessment. These data are based on the assumption that the whole extent of a feature at a site is either favourable or unfavourable and thus ignores variations in condition within a feature. In reality, H7140 stands at stands will often be a mixture of areas in favourable and unfavourable condition (e.g. Jones et al., 2010; Reed, 2011).
6.5 Short term trend of habitat area in good condition; Method used	The 7 SACs supporting H7140 as a C or B feature have all received two rounds of monitoring (the first and second rounds), with Rhos Goch the only site to date to be monitored in the current round - hence the assessment of 'insufficient or no data available'. However, between the first and second reporting rounds, the status of this feature showed no change at 6 of the 7 SACs, with Berwyn (improving) the exception. No information on the condition of this feature outside the N2K series has been collated since the last reporting round, and little if any is believed to exist.

7.1 Characterisation of pressures/ threats

Overview Analysis of Pressures and Threats has utilised a number of data sources, with NRWs Action Database (NRW, 2018c) serving as a critical resource. This provides information on 'issues' affecting habitats and species within the protected sites series in Wales and contains a total of 184 management issue entries against the 'Transition mires & quaking bogs' feature description, of which 130 management issues remain categorised as 'C' ('needs control') and requiring ongoing control, with 53 categorised as 'under control' or 'withdrawn'. The 130 issues categorised as 'C' apply across a total of 37 management units (many units have more than one management issue recorded) on 12 SSSI, including all of the SACs for which this habitat has a qualifying (C grade) presence or better (7 sites). Restricting the search term to 'Transition mire & quaking bog' means that only data for SAC sites are reported here, with the exception of a single additional SSSI (Colwyn Brook Marshes). These data are thus not wholly representative of the wider resource as it is to be expected that conservation measures would better mitigate pressures and threats inside the SAC series. However, use of the more general relevant peatland SSSI feature search term (in this case 'fen - topogenous mire') would lead to many more records and applying to peatland habitats other than H7140. The Prioritised Improvement Plans (PIPs) for Welsh SACs (NRW, 2016) have also been consulted for all SACs supporting H7140 as a C grade feature or higher. These score pressures according to priority and urgency, using High, Medium and Low scores (NRW, 2016). Pressures: A07. Abandonment of management/use of other agricultural and agroforestry systems (all except grassland) & A10 Extensive grazing or undergrazing by livestock . Insufficient grazing is noted as a high or medium priority issue and of medium or high urgency for this feature in the Prioritised Improvement Plans for the Cors Crymlyn, North West Pembrokeshire Commons, Gweunydd Blaencleddau and Corsydd Eifionydd SACs (NRW, 2016); the closely related issue of grazing type and/or timing is a medium priority and high urgency issue in the PIP for Cors Caron. Insufficient grazing is a current issue across 22 management units (59.4% of the total number of management units for which current issues are cited) for 9 SSSI in NRWs Actions Database (NRW, 2018c), with grazing type and/or timing issues cited for 9 units (24.3%) on 3 SSSI. For the 2012/13 reporting round, insufficient grazing was considered a significant issue for 56% sites supporting this feature (121 sites) and surveyed as part of the Lowland Peatland Survey of Wales (see Jones et al., 2012), with a slightly higher proportion (60%) of SSSI sites affected compared to non-statutory sites (52%): grazing type and/or timing was assessed as affecting 26% of sites in this assessment. I04. Problematic native species Scrub invasion is cited as a high or medium priority issue for the Cors Crymlyn, Cors Eifionydd and Cors Caron SACs and features as a medium or high urgency for these sites and also Gweunydd Blaencleddau. It is cited in NRWs Actions Database as a current issue for 16 units (43% of the total) on 5 sites and was noted as an issue on 30% of the 121 Lowland Peatland Survey of Wales sites supporting H7140 in the 2012/13 assessment (Jones et al., 2012). This pressure is closely linked to A07 and A10 above. JO3 Mixed source air pollution, air-borne pollutants Air pollution is cited as a high priority issue of medium urgency in all PIPs for the 7 SACs supporting H7140 as a C grade feature or higher (NRW, 2016). It is cited in NRWs Actions Database as a current issue for 13 units (35%) across 7 sites. The extent of the H7140 resource in Wales subject to N deposition in excess of the critical load for this habitat (10 kg N/ha/yr) has been assessed using the approach of Guest (2012) and using updated deposition data. Using a data overlay method in ARC GIS (Kay, 2018), 97% of the habitat by area (polygon data) was recorded at or above the relevant lower Critical Load limit. K02 Drainage (including some A31. Drainage for use as agricultural land) Drainage was noted as an issue for 26% of the 121 sites supporting H7140 and included in the Lowland Peatland Survey of Wales (Jones et al., 2012); these data also show a significant difference between the incidence of this issue on protected sites (15.9%) as opposed to non-statutory sites (36.2%). Drainage is cited as a high priority issue in the PIP for Berwyn (NRW, 2016). The related issue of 'water levels' is cited as a high priority and high urgency issue in the Cors Crymlyn and Corsydd Eifionydd PIPS, but this may

relate as much to the need to regulate flooding as excessive drainage. The issues of water levels and drainage are cited as current for 7 (19%) and 4 (11%) of units on 4 and 3 SSSI respectively in NRWs Actions Database (NRW, 2018c). A26 Agricultural activities generating diffuse pollution to surface or ground waters Diffuse water pollution is cited as a current issue for 8 units on 3 sites in NRWs Actions Database (NRW, 2018), but this may under-estimate the significance of this pressure as this issue was assessed as affecting 17 of the 121 sites supporting this habitat and included in the Lowland Peatland Survey programme (Jones et al., 2012). Water pollution from diffuse sources is cited as a high priority and high urgency in the Prioritised Implementation Plan for Cors Crymlyn (NRW, 2016) and a medium priority/urgency issue for Corsydd Eifionydd. A25. Agricultural activities generating point source pollution to surface or ground waters. Point source pollution is is cited as a current issue for 8 units on 3 sites in NRWs Actions Database (NRW, 2018) and was assessed as affecting 5 sites supporting this habitat and included in the Lowland Peatland Survey programme (Jones et al., 2012). F09. Deposition and treatment of waste/garbage from household/recreational facilities. This is reflected in the pressure 'Waste impacts - dumping spoil, leachate, sludge, etc' cited as a high priority/high urgency issue in the PIP for Cors Crylyn (NRW, 2016): this PIP pressure also relates to F13 below. This relates to ongoing nutrient pressures which are suspected to arise from former tipping activity within the catchment of Cors Crymlyn SAC (Gilman et al., 2008). Waste F13. Plants, contaminated or abandoned industrial sites generating pollution to surface or ground water. This is reflected in the pressure 'Waste impacts - dumping spoil, leachate, sludge, etc' cited as a high priority/high urgency issue in the PIP for Cors Crymlyn (NRW, 2016): this PIP pressure also relates to F109 above. This relates to ongoing suspected nutrient pressures resulting from historical oil spills and the deposotion of energy generation waste at Cors Crymlyn SAC (Gilman et al., 2008). F1. Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions). This pressure affects just one SAC, Cors Crymlyn, and concerns an extensive housing development on the western side of the site. I02 Other invasive alien species (other then species of Union concern) Terrestrial non-native species feature as a medium priority high urgency issue in the PIP for Corsydd Eifionydd - this chiefly concerns Rhododendron. This pressure is also cited for Rhosgoch Common and Gweunydd Blaencleddau in NRWs Actions Database (NRW, 2016c). N02 - Droughts and decreases in precipitation due to climate change N01 - Temperature changes (e.g. rise of temperature & extremes) due to climate change There is no specific evidence indicating impacts due to these pressures at the present time, though any such effects would be similar to the widely observed consequences of dereliction. Threats: A07. Abandonment of management/use of other agricultural and agroforestry systems (all except grassland), I04. Problematic native species & A10 Extensive grazing or undergrazing by livestock . Threats related to insufficient management or management neglect (A07, A10 & I04) will continue for the foreseeable future due to the following principal factors: (i) lack of resources for promoting and funding management agreements on statutory sites under third party management, (ii) the inadequacy of current mechanisms for promoting and where necessary enforcing the sustainable management of examples outside the protected sites series, particularly where these occur as small elements within otherwise intensively farmed contexts, and (iii) post-Brexit changes in agri-environment support. JO3 Mixed source air pollution, air-borne pollutants Despite modest projected reductions in the overall deposition rates for atmospheric nitrogen in the UK, air pollution is expected to remain a High pressure (threat) to the habitat in Wales. A provisional analysis using projected exceedance data for 2030 indicates that the area of SAC (on which H7140 is a feature) which falls in areas where deposition is above the relevant critical load will only fall by c. 6% from the 2013-2015 estimate by 2030 (JNCC, 2018). A26 Agricultural activities generating diffuse pollution to surface or ground waters Resolution of this threat requires comprehensive catchment-level integration of

	a range of existing and new measures aimed at reducing and mitigating nutrient inputs, coupled with much more intensive monitoring of groundwater and shallow marginal seepage pathways to determine the effectiveness of measures. This intervention is not currently underway or planned. A31. Drainage for use as agricultural land & K02 Drainage Drainage will continue as a threat to this habitat due to lack of resources for funding and negotiating management agreements and the difficulty associated with tackling this issues off protected sites.
8.5 List of main conservation measures	While the majority of the most important measures required to restore/maintain this habitat to FCS in Wales have been identified, the bulk have not yet been fully implemented. At the last reporting round a total of 182.7 ha of this habitat was assessed as being included within SSSI supporting a qualifying fen (topogenous mire) feature, and this feature is unlikely to have changed significantly. The total extent included within SAC was 116.9 ha in 2012. Glastir Advanced agreements only cover a maximum possible area of 41.5 ha of this habitat (Milner, 2018 - this figure assumes no overlap in prescriptions), with Glastir Entry covering a maximum possible area of 7.8 ha. Actions to address grazing (CA03 and CA05) are already completed for 9 and 5 units across 6 and 4 SSSI respectively (NRW, 2018c), with actions to address scrub invasion completed on 3 units on 3 SSSI. Actions addressing diffuse and point source water pollution impacts have been completed on 2 and 6 units across 2 and 4 sites respectively. NRW management agreements extend to just 4.5 ha, indicating the scale of the challenge which remains across the priority areas of countering drainage activity, reducing terrestrial nutrient income, and securing appropriate grazing. In terms of N deposition (CC10 and CA12), national regulations are in place but have been insufficient to prevent continued high levels of N deposition nationally (CC10) and local sources (CA12). The area of this habitat subject to critical load exceedance is not expected to reduce between now and 2030. Focussed monitoring/research is required to understand the impacts of nitrogen deposition on the habitat and implement effective mitigation. Measures to address diffuse terrestrial pollution (CA11) could be an effective means of reducing the impact of air pollution (CJ01) by reducing overall nutrient loading - this requires only localised action given the relatively small catchment area of most sites supporting H7140 in Wales. Action at the scale of a LIFE project is required to restore this habitat in Wales, with a focus on the four SACs where H7140 is a primary reason for selection and is currently in poor condition (namely Corsydd Mon, Corsydd Eifionydd, Rhosgoch and North-west Pembrokeshire Commons). This project would necessarily focus on three main issues: (i) restoring the hydrological conditions required by H7140, (ii) measures to reduce/remove terrestrial sources of nutrient enrichment and mitigate the effects of enrichment within sites, and (iii) action to restore derelict stands of H7140 through sustainable grazing and scrub removal. Ongoing notification activity is regarded as essential for H7140 given that of the 121 high quality sites selected for survey by the Lowland Peatland Survey of Wales, some 58 lie outside the SSSI series (Jones et al., 2012).
9.1 Future prospects of parameters	9.1a Future prospects of -range. No significant change in range is expected, though the discovery of new locations may add elements to the existing range map. 9.1b Future prospects of -area The area of H7140 is judged likely to decline slightly due to losses resulting primarily from scrub encroachment due to under-management: losses through the expansion of other wetland plants communities is also possible - including communities expanding as a result of nutrient enrichment such as reedswamp and reedfen. 9.1c Future prospects of -structure and function This reflects the currently poor or unknown condition of the majority of the resource (see section 6) coupled with the very modest inclusion of this habitat in agri-environment and NRW management agreements. This assessment also reflects the nature of the threats described under section 7.

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	This is the estimate used for the 2012/13 reporting round.
11.4 Short term trend of habitat area in good condition within the network; Direction	The is assessed as unknown due to the lack of third round condition data for the SAC resource. The likelihood is that the area is decreasing to the pressures considered in section 7: this is the basis for the requirement for LIFE-scale intervention described under section 8 above.