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:

H7130 - Blanket 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	**7130 - Blanket bogs (* if active bog)**

2. Maps

2.1 Year or period	1979-2012
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	Blackstock, T.H., Howe, E.A., Stevens, J.P., Burrows, C.R. & Jones, P.S. (2010). Habitats of Wales: a comprehensive field survey, 1979-1997. University of Wales Press, Cardiff. 229 pp. Chamberlain, R. & Carris, H. (2016). Planned and restored peat WGWE. Excel spreadsheet. Natural Resources Wales, 2016. Daggett, J. (2016). Cutting Molinia to improve habitat for Golden Plover, Abergwesyn Common Sharing experience: An account of management techniques used and a critique of their usefulness. In: Managing Molinia? Proceedings of a 3-day conference 14-16 September 2015 in Huddersfield, West Yorkshire, UK. Ed. R. Meade. Pp 157-164. Emmett B.E. and the GMEP team (2017). Glastir Monitoring & Evaluation Programme. Final Report to Welsh Government. Contract reference: C147/2010/11. NERC/Centre for Ecology & Hydrology (CEH Projects: NEC04780/NEC05371/NEC05782) Evans, C., Rawlins, B., Grebby, S., Scholefield, P., Jones, P. (2015) Glastir Monitoring & Evaluation Programme. Mapping the extent and condition of Welsh peat. Welsh Government (Contract reference: C147/2010/11). NERC/Centre for Ecology & Hydrology (CEH Project: NEC04780). 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, D. (2015). A Review of the Contribution the Glastir Scheme provides in the Sustainable Management of Peatland. Welsh Government. 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. (2012b). Distribution, extent and status of Annex I wetland habitats in Wales: supporting material for the 2013 Article 17 assessment. Countryside Council for

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Perry, K. (2016) Changes in the grazing regimes on Elenydd Site of Special Scientific Interest and the experimental management of Molinia caerulea. In: Managing Molinia? Proceedings of a 3-day conference 14-16 September 2015 in Huddersfield, West Yorkshire, UK. Ed. R. Meade. Pp 165-184.
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observation in an integrated framework for assessing peatland habitat condition and its impact on greenhouse gas accounting. Final report to Defra, Project number MI07. Centre for Ecology & Hydrology, Bangor.

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	1979-2012		
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value 532
5.3 Type of estimate	Best estimate		
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)		
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			

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

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km^2)	Minimum 0	Maximum 0
	b) Area in not-good condition (km^2)	Minimum 199	Maximum 199
	c) Area where condition is not known (km^2)	Minimum 333	Maximum 333
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	Increasing (+)		
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
Problematic native species (I04)	H
Extensive grazing or undergrazing by livestock (A10)	H
Drainage for use as agricultural land (A31)	H
Intensive grazing or overgrazing by livestock (A09)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Replanting with or introducing non-native or non-typical species (including new species and GMOs) (B03)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams) (B27)	M
Wind, wave and tidal power, including infrastructure (D01)	M
Other human intrusions and disturbance not mentioned above (H08)	M

Threat	Ranking
Problematic native species (I04)	H
Extensive grazing or undergrazing by livestock (A10)	H
Drainage for use as agricultural land (A31)	H
Intensive grazing or overgrazing by livestock (A09)	M
Mixed source air pollution, air-borne pollutants (J03)	H

Replanting with or introducing non-native or non-typical species (including new species and GMOs) (B03)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams) (B27)	M
Wind, wave and tidal power, including infrastructure (D01)	M
Other human intrusions and disturbance not mentioned above (H08)	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

Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Restore habitats impacted by multi-purpose hydrological changes (CJ03)
Reduce/eliminate air pollution from agricultural activities (CA12)
Implement climate change adaptation measures (CN02)
Stop mowing, grazing and other equivalent agricultural activities (CA06)
Manage/reduce/eliminate air pollution from resource exploitation and energy production (CC10)
Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation (CB01)
Adapt/change forest management and exploitation practices (CB05)
Manage drainage and irrigation operations and infrastructures (CB14)
Management, control or eradication of other invasive alien species (CI03)

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

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

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 203.58
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	Insufficient or no data available
11.6 Additional information	

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

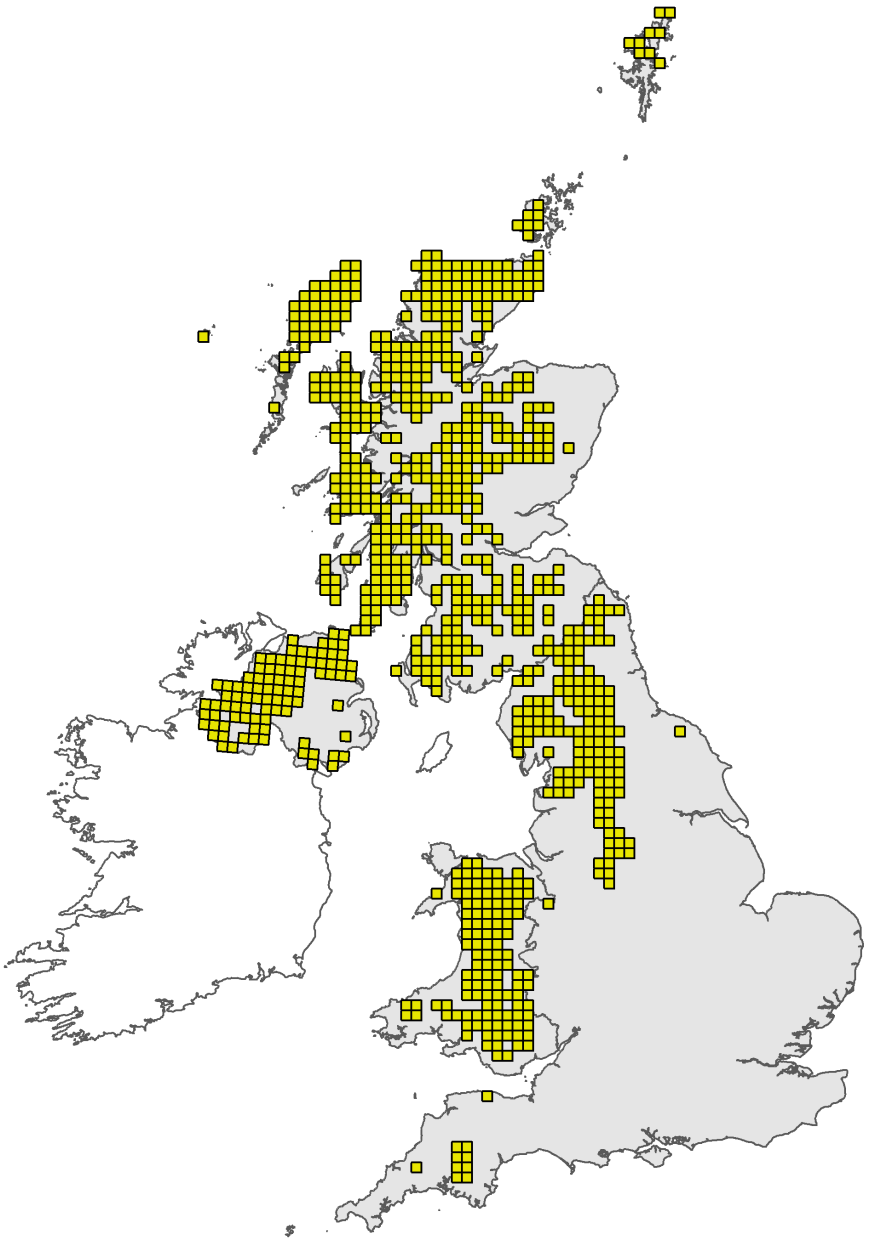

Figure 1: UK distribution map for H7130 - Blanket bogs. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

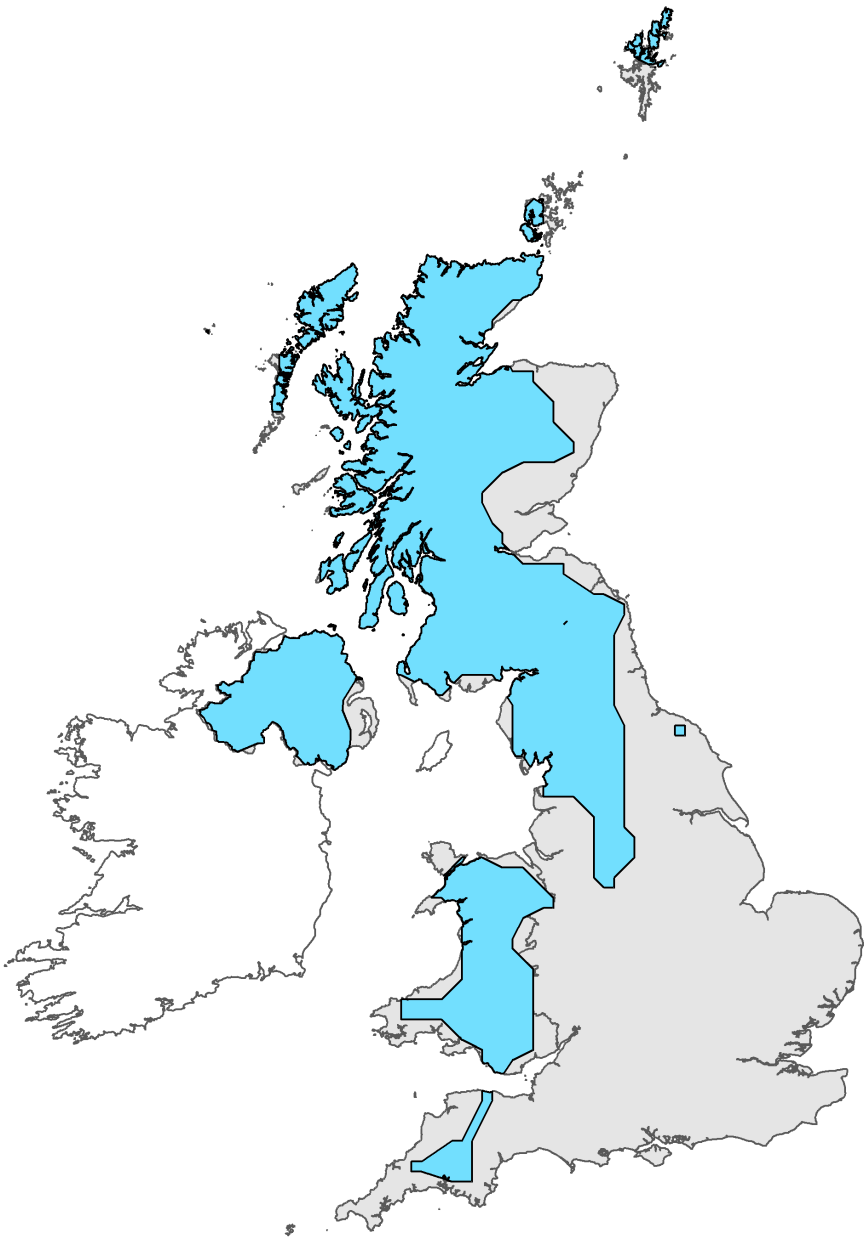

Figure 2: UK range map for H7130 - Blanket bogs. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: 7130

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. This was a new map prepared for the 2013 Article 17 reporting round (Stevens, 2012a). The general approach to collating data for the distribution map is described by Stevens (2012). NVC data from upland NVC surveys has been used wherever possible; data for uplands not covered by NVC survey has been taken from the Phase 1 1km square database where centroids of 1 km squares lie outside upland NVC site boundaries. Of the 6247 habitat records collated by Stevens & Jones (2012), 1994 are derived from the Phase 1 Habitat Survey of Wales (Blackstock et al., 2010) survey, 1664 from the Lowland Peatland Survey of Wales (Jones et al., 2011), with the remaining 2589 records coming from Phase 2 NVC surveys of the following upland blocks: Brecon Beacons (2004), Bwlch Corog (2005), Carneddau extensions (2001), Eastern Carneddau (2002), Elenydd (2002), Glyderiau (1996-1998), Glyder extensions (2002), Migneint-Dduallt (2002), Mynydd Llangatwg_Mynydd Llangynidr (2003), Mynydd Preseli SSSI (2004-2005), Pumlumon (2004), Rhinog SSSI (2003), Western Carneddau (2002)- see Turner (2011) for references and further details. This means that at least 68% of the records date from 1996 or later. There are 115 hectad records for this habitat in Wales, based on the 2012 data. Due to issues of commercial confidentiality, it has not been possible to include the now extensive plant community level data available for the many upland sites subject to windfarm applications in Wales. Further lowland records for this habitat are likely to arise leading up to completion of NRWs Lowland Peatland Survey of Wales programme. Together these sources provide a reasonably accurate impression of the distribution of this habitat but for the reasons identified here the overall dataset is not regarded as comprehensive. Stevens (2012) provides comprehensive notes on the approach taken to mapping the distribution of this habitat and reporting on its extent.

Habitat code: 7130 Region code: ATL

Field label	Note
4.3 Short term trend; Direction	There is no system in place for monitoring and recording losses and gains of blanket bog across Wales. Some localised loss of bog must inevitably have occurred during this period as a result of the growth/maturation of conifer crops planted just before or leading into this period. Modest losses have also occurred to windfarm infrastructure and also probably to agricultural improvement - particularly on upland margin examples. Conversely some gains in area since 2007 are likely following the permanent removal of conifers on parts of the Welsh Government Woodland Estate (see also 9.1); however, the area of peatland actually recovering as blanket bog in these contexts has not been assessed. These changes are relatively unlikely to have resulted in significant changes to the overall 10 km2 distribution or linked range (which would require either the loss of all examples within a given hectad or habitat recreation/restoration within a previously unoccupied square), however the possibility cannot be discounted.
4.11 Change and reason for change in surface area of range	The judgement is no change is because habitat distribution data from the last reporting period have been used and no changes made. Changes in surface area of range may actually have occurred since the last reporting period. Habitat range is determined by the Habitat Map (2.3) and therefore uses the same evidence sources.
5.2 Surface area	532 km2 This is based on the habitat inventory described under distribution and based on Stevens & Jones (2012).

5.8 Short term trend; Method used	There is no system in place for monitoring and recording losses and gains of habitat resources across Wales. Some gains in area since 2007 are likely as a result of the permanent removal of conifers on the Welsh Government Woodland Estate (see also 9.1); however the area of peatland actually recovering as blanket bog in these contexts has not been assessed.
5.10 Long term trend; Direction	NRW lacks a system for recording losses and gains of habitat in Wales.
5.14 Change and reason for change in surface area	The extent estimate is the same as that submitted in the 2013 report and is based on the same underpinning data (Stevens & Jones, 2012). It has not been possible to incorporate any additional data.
6.1 Condition of habitat	Good - 0 km2 Not good - 199 km2 Unknown - 333 km2 Condition assessments are available for all notified blanket bog SAC features in Wales. Collectively they include 199km2 of blanket bog, representing roughly 37% of the entire welsh resource. All of the features were assessed as being in unfavourable (not good) condition. It should, however, be noted that these Common Standards Monitoring assessments describe the overall condition of the entire feature within a protected site. These features are in some cases very extensive, covering 1000's of hectares of blanket bog, and will typically encompass significant variation in quality and structure and function.
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 2007 and 2016 (NRW, 2018a). These data indicate the following for blanket bog features within Welsh SACs: Berwyn (A), Unfavourable-Unclassified, Sept 2011,; Elenydd (B), Unfavourable - Unclassified, Aug 2012; Cadair Idris (C), Unfavourable - No change, Jun 2010; Eryri (C), Unfavourable - No change, Jul 2011; Gweunydd Blaencleddau (C), Unfavourable - Unclassified, Jul 2016; Migneint-Arenig-Dduallt (B), Unfavourable - No change, Oct 2012; Rhinog (C), Unfavourable-Unclassified, Jul 2011; Usk Bat Sites (C), Unfavourable-Unclassified, Sep 2010. All but one of these assessments pre-dates the last reporting round and all reported Unfavourable condition. The only assessment post-dating the last reporting round (for Gweunydd Blaencleddau - where blanket bog is a C feature) also returned an Unfavourable judgement. Remote sensing offers a potential means of assessing blanket bog condition. However, at the moment in the UK the technique is being focussed on assessing the representation of 'condition' states associated with specific green-house gas (GHG) emissions scenarios rather than condition sensu CSM, and as Williamson et al. (2018) report 'CSM reporting categories do not map well onto the condition categories from which GHG emissions and other peatland functions are determined'.
6.4 Short term trend of habitat area in good condition; Direction	Monitoring results from the Glastir Monitoring & Evaluation Scheme (GMEP; Emmett et al., 2017, Table GMEP-BD-OUTCOME-C-3 p. 45) indicate a statistically significant improvement in the condition of blanket bog between the 2013-16 data collection round and both 2007 and 1990 as determined using CSM (see also https://gmep.wales/biodiversity/, accessed on-line 1/5/18). However, the area of habitat in good condition sensu CSM is unknown.

7.1 Characterisation of pressures/ threats

Analysis of Pressures and Threats has utilised a number of data sources, with NRWs Action Database (NRW, 2018b) serving as a critical resource. A search has been conducted using the feature types 'blanket bog' (H7130) and the wider feature type 'blanket bog - other ombrogenous mire' because of the relatively close overlay between these feature types. The Actions Database (NRW, 2018b) provides information on 'issues' affecting habitats and species within the protected sites series in Wales and contains a total of 2664 management issue entries against the two feature types, of which 2174 remain categorised as 'C' and requiring ongoing control, with 432 'R' (resolved), 21 'W' (withdrawn) and 37 un-assigned. These apply across a total of 540 management units (many units have more than one management issue recorded) on 38 SSSI, including all of the SACs for which this habitat is a feature. Of the 38 SSSI, the feature 'blanket bog - other ombrogenous mire' is considered likely to be incorrect or at least dubious for 3 sites (namely Cors Bwlch-y-baedd, Llay Bog and Rhos-Rydd); data for these sites have been excluded in the following analysis. Double counting of pressures, as might occur for units with both features recorded, has been avoided by deleting any duplicate entries for current issues on units. The Prioritised Improvement Plans (PIPs) for Welsh SACs (NRW, 2016a) have also been consulted for all SACs supporting H7130 as a C grade feature or higher. These score pressures according to priority and urgency, using High, Medium and Low scores (NRW, 2016a). Pressures: I04. Problematic native species The pressure of problematic native-species centers around the over-dominance of Molinia caerulea and, increasingly, Calluna vulgaris in response to a range of past and current management issues and environmental pressures: these include past over-grazing and burning, drainage, and under- or inappropriate grazing coupled to atmospheric nitrogen deposition. Dominance by Molinia is most problematic in mid and south Wales, whilst Calluna dominance is becoming a major issue in north Wales where Calluna-Eriophorum bog is widespread, chiefly in response to reduced grazing levels and a decline in traditional heft-based grazing systems. See also A10. A10 Extensive grazing or undergrazing by livestock Insufficient grazing is recognised as a current issue for 63 units on 11 sites and is a high or medium priority issue in the PIPs for 4 SACs. Insufficient grazing and over-grazing are closely linked to the related pressure of 'grazing type/and or timing, which is listed as a current issue for 177 units on 20 SSSI: this is listed as an issue in the PIPs for all but one of the 8 blanket bog SACs, and a high or medium priority issue for five SACs. The issue of invasive 'Terrestrial - native and archaeophyte' is probably closely linked to extensive grazing and is a current issue for 20 units on 9 SSSI; scrub; the issue of scrub-invasion affects 30 units on 9 sites and links to pressure I04 problematic native species. The related issue of 'insufficient cutting/mowing' affects 27 units on 7 SSSI and relates in the main to the lack of sufficient cutting to enable grazing. A31 Drainage for use as agricultural land. Evans et al. (2015) estimate that drainage amounts to a total length of 1502 km on upland deep peat soils in Wales. This assessment only covered c. 73% of the unafforested upland deep peat resource, so the true figure is likely to be closer to 2057 km: a significant proportion of this is likely to be blanket bog. Up until 2016 it is estimated that only 742 km of drainage ditches on blanket bog had been blocked (NRW, 2016b). Thus this has been a significant pressure since the 2012/13 reporting round. Drainage remains cited as a current issue for 81 units across 9 SSSI and is noted in the PIPs as a High Priority issue for Migneint and the Berwyn. The closely related issue of ditch management is a current issue for 22 units on 9 SSSI, with water levels cited as a current issue for 3 units on 2 SSSI. Collectively, these three issues remain current for 106 units on 14 sites. Some hydrological pressures result from the forestry activity B27 Modification of hydrological conditions, or physical alternation of water bodies and drainage for forestry (including dams), but it has not been possible to assess how many reported hydrological pressures in the Actions Database are directly attributable to this. A09 Intensive grazing or overgrazing by livestock Over-grazing has remained an issue throughout the reporting period, being listed as a current issue on 74 units across 12 SSSI. It remains cited as a pressure (between low and high) for 4 of the SACs supporting this feature in NRWs

Prioritised Implementation Plans (NRW, 2016a). Intensive grazing is one of the main causal factors of peat erosion, which affects a minimum of 183 locations (chiefly upland blanket bog) in Wales, with erosion affecting c. 542 ha (NRW, 2016c). J03 - Mixed source air pollution, air-borne pollutants Air pollution (N deposition) (J03) is assessed separately using a defined approach (Guest, 2012), using updated (2013-2015) deposition data. Using a data overlay method in ARC GIS, 100% of the habitat by area (polygon data) was recorded at or above the relevant lower Critical Load limit (5 kg N/ha/yr). Atmospheric pollution has been identified as a current issue on 312 land management units across 14 SSSI (NRW, 2018b). This is cited as a high priority pressure in the Prioritised Action Plans for 6 of the 8 SACs supporting this feature (NRW, 2016); it should be recognised for the remaining two (Migneint and Elenydd). B03 Replanting with or introducing non-native or non-typical species (including new species and GMOs) The issue of Impacts from terrestrial non-native species is reported as current for 33 units on 9 SSSI in NRW (2018c) and some of this is attributable to the spread of self-sown conifers onto areas of blanket bog fringing conifer forestry. There is a close inter-relationship between this pressure and A10 as under-grazing and inappropriate grazing stock are a contributory factor. This is classed as a medium priority threat in the PIPs for three SAC. B01 Conversion to forest from other land uses, or afforestation (excluding drainage), & B27 Modification of hydrological conditions, or physical alternation of water bodies and drainage for forestry (including dams). Multiple issues relate to these pressures. The issue of 'tree planting past and present' is listed as a current issue for 6 units on 4 SAC and concerns the need to remove planted conifers and also address re-seeding. The issue of 'woodland management and tree felling' is listed as a current issue for 11 units of 4 sites and concerns the identified need for conifer removal within and adjacent to protected sites, coupled with removal of seedlings. H08 Other human intrusions and disturbance The issue of human access and use leading to erosion and disturbance is cited as a current issue for 24 units across 6 SSSI for the two blanket bog features, with the Eryri SAC registering the highest number of units. The closely related pressure of 'inappropriate vehicle use' currently affects 23 units on 9 SSSI. Taken together, these two issues currently affect 43 units on 11 SSSI. G08. Management of fishing stocks and game Included here are 'excessive cutting' (recognised as a current issue on 4 units on 2 SSSI) for game birds and avifauna conservation, and other issues relating to 'game management' which affect 6 units on 2 SSSI. D01. Wind, wave and tidal power, including infrastructure Wind-power generation poses two immediate pressures; loss of habitat beneath the footprint of infrastructure (including turbine footings, crane pads, tracks and quarries), and impacts on areas of bog adjacent to infrastructure posed by hydrological and fragmentation issues. A third potential pressure concerns the potential for wind-farm establishment to alter existing grazing etc management practices, though Habitat Management Plans can also represent positive impacts. This pressure affects multiple sites in Wales supporting H7130 (at least ten sites). A11 Burning for agriculture This remains as an issue for 14 units on 4 SSSI and is a medium or high priority issue in the PIPs for 4 SACs. 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 little specific evidence indicating impacts due to these pressures at the present time; any such impacts would, in any case, be difficult to disentangle from current drainage mediated impacts. Threats: A10 Extensive grazing or undergrazing by livestock & I04 problematic native species. Significant effort has been made to achieve satisfactory grazing levels, with 'grazing type and/or timing' resolved or withdrawn on 86 units on 19 SSSI, with the equivalent figures for 'insufficient grazing' being 17 units on 10 SSSI. Nevertheless, this issue is likely to remain significant for the foreseeable future, with uncertainty over the viability of upland grazing units in the post-Brexit era a further concern. 'Insufficient cutting/mowing' has been resolved or withdrawn on 10 units across 5 sites. A31 Drainage for use as agricultural land. The remaining open drains will remain as a threat to large areas of blanket bog during the next two reporting periods

as complete restoration of all blanket bog drains in Wales is unlikely to be completed within the next reporting round (drainage is only classified as resolved or withdrawn for 24 units on 4 SSSI, compared against its status as a current threat on 81 issues across 9 SSSI). Even where grips are blocked, peat shrinkage effects caused by drainage will persist for many decades, causing some ongoing drainage. A09 Intensive grazing or overgrazing by livestock Some progress has been made in resolving this as an issue based on the fact that it has been resolved or withdrawn as an issue for 55 units across 13 SSSI. Nevertheless, overgrazing has been and remains a severe issue for some parts of the resource, with the Carneddau Mountain range probably the most acute example in a Welsh context. Peat erosion, which is associated with past over-grazing as well as a range of other pressures, is a generally localised but sometimes very significant issue and will remain so during the next two reporting periods at least. 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 H7130 is a feature) which falls in areas where deposition is above the relevant critical load will not fall at all from the 2013-2015 estimate (JNCC, 2018). B03 Replanting with or introducing non-native or non-typical species (including new species and GMOs) The issue of terrestrial non-native species is reported as resolved on 9 units across 6 SSSI, but the spread of conifers onto blanket bog from adjacent conifers plantations will continue into the forseeable future. This requires a new approach to determining plantation boundaries in relation to semi-natural peatland habitats - aimed at improving peatland ecosystem resilience and delivering sustainable management. B01 Conversion to forest from other land uses, or afforestation (excluding drainage), & B27 Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams). This pressure will continue as a future threat. This is because there is at present no financial mechanism for making peatland restoration after afforestation an attractive prospect relative to replanting. Whilst NRW has a programme of peatland restoration for afforested sites on land under its own management, limitations in funding restrict this restoration to a small number of priority sites (Vanguelova et al., 2012). D01. Wind, wave and tidal power, including infrastructure This remains a threat both to sites where windfarms have been developed and also to sites at the proposal/planning stage. A11 Burning for agriculture Although resolved or withdrawn as an issue for 12 units on 9 SSSI, this issue remains as a threat and may increase with reduced grazing due to enhanced fuel load, though this should be offset to a degree by hydrological restoration actions. Burning of blanket bog vegetation is now only permitted in accordance with the Heather & Grass burning regulations (Welsh Government, 2008). H08 Other human intrusions and disturbance This issue is likely to be ongoing into at least the next reporting round based on the relatively modest number of units where these issues have been resolved, namely 7 units and 4 SSSI for 'Access/Use - erosion/disturbance/damage' and 1 unit on a single SAC for 'inappropriate vehicle use'. N02 - Droughts and decreases in precipitation due to climate change Modelling predicts that water table draw-down in peat bogs during summer will become more marked (Lindsay et al., 2014). Increased temperatures may lead to increased decomposition of peat-forming material in active, healthy bogs, although this is still an issue of debate. However, the resilience of ombrogenous bogs to climate change has been convincingly linked to the living surface (acrotelm) of 'active' bogs; thus restoration to sustain or restore this critical feature is the best approach for mitigating the effects of climate change.

8.5 List of main conservation measures	CA05. Adapt mowing, grazing and other equivalent agricultural activities. There is significant scope for the development of a major initiative (of the scale which might be elligible for LIFE funding for example) to achieve large-scale restoration of Molinia dominated blanket bog in south and central Wales. Initial trials (Daggett, 2016; Perry, 2016) indicate that cutting and grazing Molinia do achieve positive results, and that cut arisings can be used to promote vegetation recovery in eroded areas. This is the one of the main priorities for blanket bog restoration in Wales. The measure CS04 is also relevant here and is effectively the requirement for CA05. Extensive effort has been devoted to reducing stocking levels on Welsh blanket bogs, with 24,489 ha currently included in the Glastir Advanced additional management payment for reducing stocking levels (Milner, 2018), and 10,105 ha included in the 'Grazing management of open country' prescription (41a) - see Milner 2018. However, there is at the moment significant debate about whether near-natural blanket bog 'requires' any grazing at all (see Turner, in prep.) and this needs to be resolved in the near future. In the meantime, low level grazing is widely used as a means of maintaining structure and preventing scrub and conifer seedling encroachment. CJ03 Restore habitats impacted by multi-purpose hydrological changes & CJ02 Reduce impact of multi-purpose hydrological changes There is an obvious and urgent requirement to block the remaining sections of open active drains (grips) on Welsh blanket bogs: these are estimated to extend over a sum distance of at least 760 km (see A31 under section 7 above): this is identified as action BB1 in the proposed national action plan for Welsh peatlands (Jones, 2018). Currently some 278 ha of blanket bog is registered under the additional payment for rewetting option (option 403) of Glastir Advanced (Milner, 2018). A review of the inclusion of peatlands habitats in Glastir in 2015 (Jones, 2015) found that the total length of grips blocked under Glastir Advanced in deep peat areas was c.18.75km, suggesting that only c.4% of grips on peatland entered into Glastir Advanced had been blocked and only 1.5% of all grips on deep peat in Wales had been blocked using the Glastir Advanced area. Thus it seems that the potential of Glastir Advanced as a mechanism for achieving grip blocking has been under-utilised. CN02 Implement climate change adaptation measures Welsh blanket peatlands represent the largest terrestrial carbon resource in Wales and measures to restore mires to active status represents the best means of reducing carbon loss or even promoting net carbon uptake to these ecosystems. CA06. Stop mowing, grazing and other equivalent agricultural activities This measure is likely to be required in eroded areas, coupled with measures to restore water levels and stabilise and revegetate peat surfaces. This measure could be applied more widely on sites with fully restored hydrological regimes, though atmospheric deposition may impose a requirement for longer-term light grazing. CL04 Other measures related to natural processes This measure is included to address peat erosion which in may have arisen initially through natural processes before being exacerbated by over-grazing and or burning, together with atmospheric pollution. A national programme is required to restore peatland and where possible peat-forming vegetation to severly eroded areas. CC10 Manage/reduce/eliminate air pollution from resource exploitation and energy production, & CA12 Reduce/eliminate air pollution from agricultural activities. National regulations are in place but have been insufficient to prevent continued high levels of N deposition nationally (CC10) and locally increasing ammonia pollution from expansion of poultry units (CA12). The area of this habitat subject to critical load exceedance is not expected to reduce between now and 2030. CB05 Adapt/change forest management and exploitation practices & CB14 Manage drainage and irrigation operations and infrastructures (forestry). Significant scope exists for further prioritising conifer removal and peatland restoration at locations where this can make a tangible contribution to habitat expansion and increasing the resilience of peat bodies: this should not be limited to the current 'top ten' suite of sites (Vangeulova et al., 2012). A new mechanism is new urgently needed to offer realistic incentives to support restoration by the private sector. A comprehensive approach is needed to ensure that full hydrological restoration and

appropriate grazing management are implemented following tree removal. CI03. Management, control or eradication of other invasive alien species This measure is required to control the spread of conifer and rhododendron seedlings, in particular where areas of lightly or un-grazed bog adjoin or are relatively close to conifer plantations. CC03 Adapt/manage renewable energy installation, facilities and operation All existing windfarm sites on deep peat should be reviewed to ensure compliance with agreed Habitat Management Plans and also to determine if HMPs adequately mitigate windfarm infrastructure impacts and actually offer net gain in terms of biodiversity and greenhouse gas emissions reductions. Any new windfarms should adopt stringent best-practice in these regards. CA01 Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land Ongoing losses of habitat at the upland fringe have been noted within the last decade, and continued vigilance will be needed, with application of the EIA regulations where required (Welsh Government, 2017).

9.1 Future prospects of parameters	9.1a Future prospects of -range. Future trend: overall stable Significant changes to the 10km square distribution and linked range of blanket bog in Wales are considered unlikely to occur over the next 12 years. Localised gains and losses of habitat are anticipated (see section 9.1b below) but are unlikely to the result in a change to the underpinning 10km square distribution. 9.1b Future prospects of -area This assessment is based on predicted gains in peatland habitat area resulting from the removal of conifers from blanket peat, and includes work undertaken as part of NRWs Afforested Peat Programme. Under this programme, Chamberlain & Carris (2016) report that by December 2016, 65.9 ha of afforested peat had already been 'restored', with restoration of another 124.5 ha in progress and 589.5 planned. Note, however, that verification of whether sites have actually been restored (in the sense that key structures and functions have been restored) has not yet been undertaken. These figures are likely to be offset to a degree by some ongoing losses of habitat, but the overall trend is predicted to be positive. 9.1c Future prospects of -structure and function Substantial areas of H7130 are included within SAC (20,358 ha, Milner [2018]), with 32,461 included within SSSI and 3979 ha included in NRW Management Agreements according to Milner (2018). This last figure represents a significant drop on the 2012 estimate of 7192 ha (Stevens), though this may partly relate to the GIS overlay methodology employed in the current reporting round. Several large-scale habitat restoration projects have been completed between the previous and current reporting round, including RSPB's Active Blanket Bogs in Wales project (which among other outcomes resulted in the blocking of 459.5 km of grips over 7061 ha of bog, RSPB, 2012) and Welsh Government funded projects led by Snowdonia National Park. Substantial areas of this habitat are included in Glastir Advanced Agreements, with 24,489 ha included in the '411 Reduce Stocking' additional management payment (Milner, 2018) and 10,105 ha in the '41a Grazing Management of Open Country' option (there is likely to be significant overlap between these figures). However, some Glastir Advanced options are known to be being under-utilised - notably grip blocking (see Threats above). Although substantial areas of this habitat are included in protected sites and also covered by agri-environment scheme elements which would be expecting to yield improvements in condition, monitoring results from the Glastir Monitoring & Evaluation Scheme (GMEP; Emmett et al., 2017, Table GMEP-BD-OUTCOME-C-3 p. 45) indicate no change in the condition of blanket bog between land within the Glastir scheme compared to all Wales as determined using CSM (see also https://gmep.wales/biodiversity/, accessed on-line 1/5/18). The same study indicates a statistically significant improvement in the condition of blanket bog between the 2013-16 data collection round and both 2007 and 1990 as determined using CSM (see section 6.4 above). However, despite this apparent improvement in the habitat's condition since the 1990s, significant threats remain and in many areas are unlikely to be fully addressed by either planned or already instigated conservation measures; notably all areas of the habitat are currently subject to deposition rates of reactive nitrogen which are in excess of the Critical Load. Given the extent of ongoing N critical load exceedance the trend in the habitats structure and function is judged likely to be negative
11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	203.58 km2 This is a new figure (Milner, 2018) based on digital overlap of SAC boundaries on the 2012 inventory data of Stevens & Jones (2012).

11.4 Short term trend of habitat area in good condition within the network; Direction	SAC monitoring data (NRW, 2018a) show no clear trend of an improvement in condition based on comparison of the 1st and 2nd and (where available) 2nd and 3rd reporting rounds. The judgement of Unfavourable - recovering for this feature on Elenydd in September 02 was followed by a judgement of Unfavourable - unclassified at the second report round, whilst the initially favourable status of the feature on Rhinog in the first reporting round had changed to Unfavourable in the 2nd round. Set against this are the monitoring results from the Glastir Monitoring & Evaluation Scheme (GMEP; Emmett et al., 2017, Table GMEP-BD-OUTCOME-C-3 p. 45) which indicate a statistically significant improvement in the condition of blanket bog between the 2013-16 data collection round and both 2007 and 1990 as determined using CSM (see also https://gmep.wales/biodiversity/, accessed on-line 1/5/18). However, the area of habitat in good condition sensu CSM is unknown. Preliminary data from a survey of management compartments on theMigneint SAC (Reed, 2018*) suggest that of a survey area of 682 ha across 3 hefts on the Ysbyty (NT owned) section of the SAC, some 661 ha is in favourable condition in terms of vegetation composition, though all of it would be regarded as Unfavourable - recovering as a result of ongoing recovery of hydrological regimes following grip blocking. Overall, there is no satisfactory evidence base from which to assess a clear trend in condition across the SAC resource in Wales at the present time. *Note this work is part of a larger NT led study of bog condition on the Migneint Ysbyty estate, the results of which were not made available for this round of Article 17 reporting.