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:

H6410 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

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	**6410 - Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molin**

2. Maps

2.1 Year or period	1987-2012
2.3 Distribution map	Yes
2.3 Distribution map Method used	Complete survey or a statistically robust estimate
2.4 Additional maps	No

BIOGEOGRAPHICAL LEVEL

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs	**Atlantic (ATL)**
3.2 Sources of information	Anon. 2006. Monitoring the Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) (Habitat 6410) at Corsydd M00f4n / Anglesey Fens SAC. 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. Countryside Council for Wales. 2012. Interpretation of grassland Annex 1 habitats in Wales for 2013 Article 17 reporting. CCW HQ internal document. Drewett, D. 2016 Rhos Goch SAC Monitoring Report: Molinia meadows on calcareous, peaty or clayey silt-laden soils (Molinion caeruleae). Monitoring Round 2013 to 2018. Fowbert, J.A., Hopwood, G.A., Milner, K.E., Towers, J. & Lovering, T.A. 2010. Marshy grassland SSSI condition assessments - Ceredigion 2007-08. CCW Regional Report No. CCW/WW/10/1d Garrett, H. 2010. UK0030104 Cadair Idris SAC. H6410 Molinia Meadows on Clayey, Silt-laden or Peaty Soils (Molinion caeruleae). SAC Monitoring report monitoring cycle 2007 - 2012 Guest, D. 2012. Assessing N deposition as a pressure for Article 17 reporting on habitats. CCW HQ internal document. Harrison, T. & Creer, J. 2009. Halkyn Mountain / Mynydd Helygain SAC. 6410: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae). SAC Monitoring report 2009. Hudson, J. 2018. Yerbeston Tops SAC Monitoring Report. Molinia Meadows. Monitoring Round 2013 to 2018 Rodwell, J.S. (ed.). 1991. British plant communities Volume 2. Mires and heaths. Cambridge University Press, Cambridge. NRW. 2015. Natura 2000 Thematic Action Plan. Air pollution: Nitrogen deposition. LIFE Natura 2000 Programme for Wales. NRW. 2017. Actions Database. NRW internal database. NRW. 2018. Briefing Note. Article 17, 2013-18: Pressures, threats and conservation measures guidance. Internal NRW document. Ridding, L.E., Redhead, J.W. & Pywell, R.F. 2015. Fate of semi-natural grassland in England between 1960 and 2013: A test of national conservation policy. Global Ecology and Conservation 4: 516-525.

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Rodwell, J.S. (ed.). 1991. British plant communities Volume 2. Mires and heaths. Cambridge University Press, Cambridge.
Smith, S.L.N. 2012. An assessment of revisits to Lowland Grassland Survey of Wales sites with H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae). CCW, 2012.
Smith, S.L.N., Sutton, M.D. & Turner, A.J. In prep. An assessment of a selection of non-statutory priority grasslands in Wales. NRW Evidence Report.
Stevens, J. & Smith, S. 2012. H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae): Wales GIS inventory. CCW HQ dataset.
Stevens, D. P., Smith, S. L. N., Blackstock, T. H., Bosanquet, S. D. S. & Stevens, J. P. 2010. Grasslands of Wales. A survey of lowland species-rich grasslands, 1987-2004. University of Wales Press, Cardiff.
Welsh Government. 2018. Woodlands for Wales: The Welsh Government's Strategy for Woodlands and Trees.
Wilkinson, K. 2014. Aberbargoed Grasslands SAC UK (0030071). Feature code 6410: Molinia meadows. SAC Monitoring report 2014. Monitoring cycle 2013 - 2018.
Wilkinson, K. 2015. Glaswelltiroedd Cefn Cribwr/Cefn Cribwr Grasslands SAC Monitoring Report. Molinia meadows. Monitoring Round 2013 to 2018
Wilkinson, K. 2016a. Caeau Mynydd Mawr SAC Monitoring Report. Molinia meadows. Monitoring Round 2013 to 2018
Wilkinson, K. 2016b. Drostre Bank SAC Monitoring Report. Molinia meadows. Monitoring Round 2013 to 2018
Wilkinson, K. 2016c. Gweunydd Blaencleddau SAC Monitoring Report. Molinia meadows. Monitoring Round 2013 to 2018
Wilkinson, K. 2016d. North West Pembrokeshire Commons SAC Monitoring Report. Molinia meadows. Monitoring Round 2013 to 2018
Wilkinson, K. 2017. Cwm Cadlan SAC Monitoring Report. Molinia meadows. Monitoring Round 2013 to 2018.
Wilkinson, K. In prep. Gower Commons Molinia meadows SAC Monitoring Report and Performance Indicators Monitoring Round 2013 to 2018.

4. Range

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

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

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 5.156
5.3 Type of estimate	Best estimate		
5.4 Surface area Method used	Complete survey or a statistically robust estimate		
5.5 Short-term trend Period	2007-2018		
5.6 Short-term trend Direction	Decreasing (-)		
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	1994-2018		
5.10 Long-term trend Direction	Decreasing (-)		
5.11 Long-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.12 Long-term trend Method used	Based mainly on extrapolation from a limited amount of data		
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 0.087	Maximum 0.087
	b) Area in not-good condition (km²)	Minimum 1.586	Maximum 1.586
	c) Area where condition is not known (km²)	Minimum 3.483	Maximum 3.483
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	2004-2017		
6.4 Short-term trend of habitat area in good condition Direction	Uncertain (u)		
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

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Pressure	Ranking
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	H
Intensive grazing or overgrazing by livestock (A09)	H
Extensive grazing or undergrazing by livestock (A10)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	M
Burning for agriculture (A11)	M
Drainage for use as agricultural land (A31)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Drainage, land reclamation and conversion of wetlands, marshes, bogs, etc. to settlement or recreational areas (F26)	M

Threat	Ranking
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	H
Intensive grazing or overgrazing by livestock (A09)	H
Extensive grazing or undergrazing by livestock (A10)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	M
Burning for agriculture (A11)	M
Drainage for use as agricultural land (A31)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Drainage, land reclamation and conversion of wetlands, marshes, bogs, etc. to settlement or recreational areas (F26)	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

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8.4 Response to the measures

8.5 List of main conservation measures

Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land (CA01)
Maintain existing extensive agricultural practices and agricultural landscape features (CA03)
Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production (CA09)
Management of problematic native species (CI05)
Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures (CA04)
Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)
Reduce impact of mixed source pollution (CJ01)
Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation (CB01)

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

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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	1.642
11.2 Type of estimate	Minimum	
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	Decreasing (-)	
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

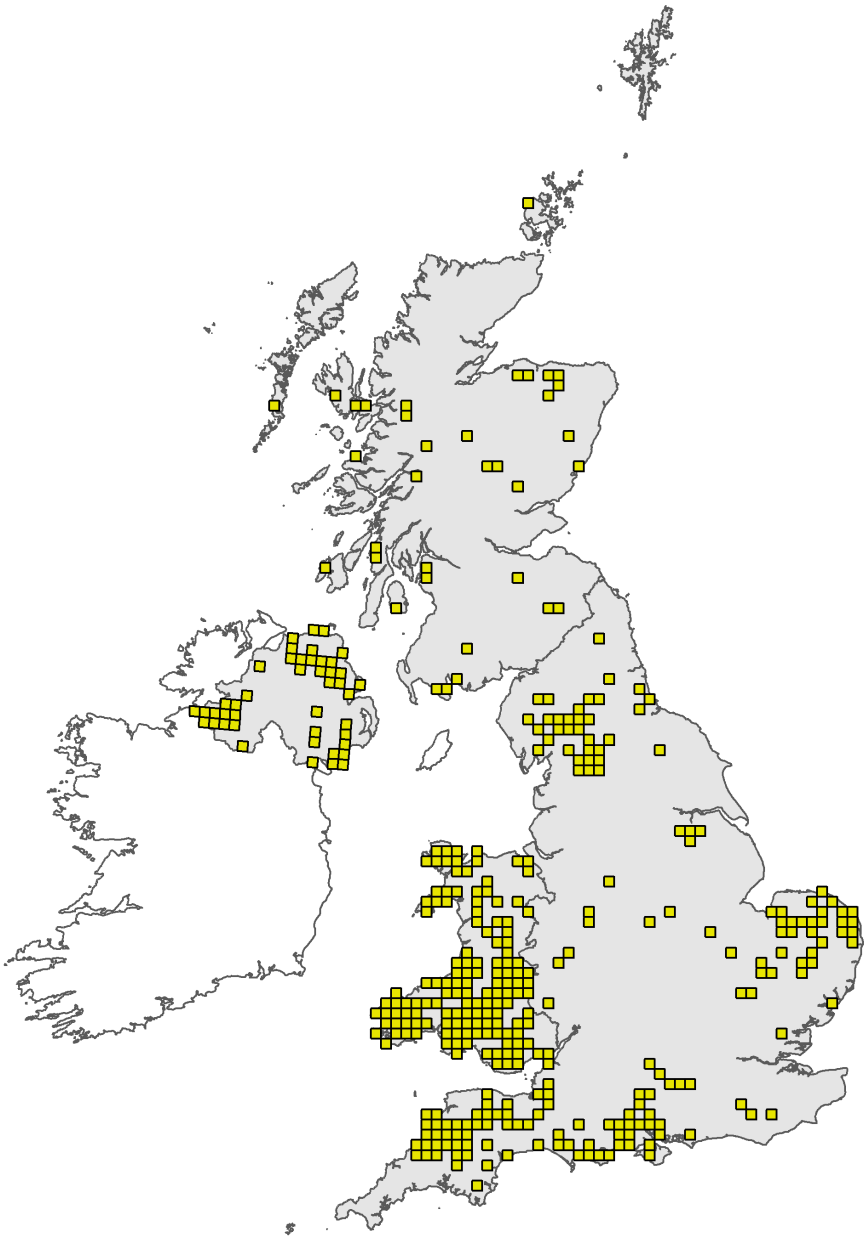

Figure 1: UK distribution map for H6410 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains 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

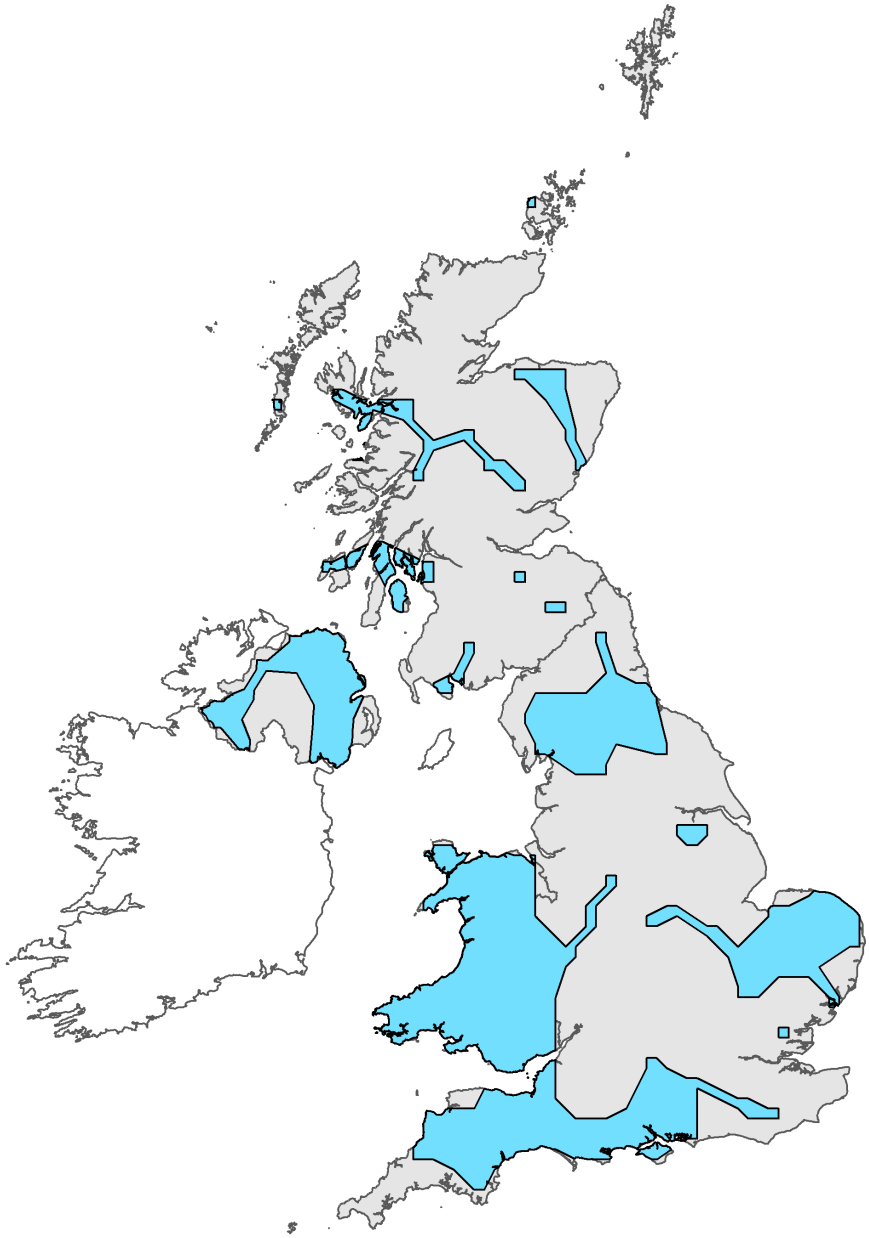

Figure 2: UK range map for H6410 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 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: 6410

Field label	Note
2.3 Distribution map; Method used	The distribution (and extent) of H6410 was calculated using three data sources, which are summarised below. A polygon-based GIS inventory for the habitat was produced for the previous Article 17 reporting round through pooling these data sources (Stevens & Smith, 2012), and this is presented again for this reporting round. The bulk of the underpinning habitat survey work summarised below was conducted before 2007, and it has not been possible to include any post-2012 updates to the datasets due to time constraints. Data source 1 (main data source): Lowland Grassland Survey of Wales (LGSW) (main tranche of survey: 1987 to 2004 (Stevens et al., 2010)). This is a targeted NVC (Rodwell (ed.), 1991) survey focussing on grasslands of high conservation interest in the Welsh lowlands. All LGSW occurrences of NVC M24 and M26 were included in the definition of H6410. The LGSW drew information from the Habitat Survey of Wales (Blackstock et al., 2010), a comprehensive field-by-field survey which provisionally identified stands of M24/M26 for more detailed survey. Data source 2: Lowland Peatland Survey of Wales (LPSW): 2004 to present. This is an ongoing NVC survey program, focussing on mire and fen habitats. All examples of M24 from this survey up to 2012 were included in the inventory where they do not correspond with habitat H7210, which is largely defined by the presence of Cladium mariscus (see CCW (2012) for details of habitat interpretation). No examples of M26 have been recorded by this survey. Data source 3: Lowland Heathland Survey of Wales (LHSW): 1993-2001. A third strategic NVC survey, focussed on lowland heathland sites. All M24 examples from this survey were included in the inventory (no M26 recorded). Although the data together are considered to give comprehensive coverage of the region, there are some minor potential deficiencies which may affect range: 1) Small stands of the habitat (under 0.5 ha) were not targeted for NVC survey unless they occurred in association with other semi-natural grassland/mire/heathland types of high conservation value. 2) Some examples of H6410 may have been overlooked during Phase 1 survey, as the habitat can be difficult to distinguish from related habitats, especially outside the peak survey season. Data/information compiled since 2012, although not included in the GIS inventory of the habitat, have been used to inform trends in the habitat. Post 2012 data/information includes: a) Smith (2012) collated information on 91 H6410 sites from revisits between 2007and 2012. b) Smith et al. (in prep.) revisited 14 H6410 sites between 2015 and 2017. c) SAC monitoring visits were undertaken to ten sites during the 2013-18 reporting period (Wilkinson, 2014; Wilkinson, 2015; Drewett, 2016; Wilkinson 2016a; Wilkinson, 2016b; Wilkinson, 2016c; Wilkinson, 2016d; Wilkinson, 2017; Hudson, 2018; Wilkinson, in prep.), a further three sites in the 2007-12 period (Fowbert et al., 2010; Garrett, 2010; Harrison & Creer, 2009), and one further site in 2006 (Anon, 2006). Both a) and b) above suggest recent decline in the habitat in Wales and this decline is more likely to have significant influence on range and extent than the minor potential deficiencies listed above in 1) and 2). For details of interpretation of H6410 in Wales see CCW (2012).

Habitat code: 6410 Region code: ATL

Field label	Note
4.3 Short term trend; Direction	See 4.11

4.11 Change and reason for change in surface area of range	The range and extent data provided in this reporting round are identical to that provided in 2013. Limited additional information on extent and distribution of the habitat is available (see 2.3) but has not been used in the range and extent assessments in this reporting round due to time constraints. The results of Smith (2012) and Smith et al. (in prep.) show decline in the area of the habitat since the bulk of the data used to derive range and extent were collected (before 2007), but the full extent of decline across the region and any effect on range are unclear.
5.3 Type of estimate	The data used to produce the total area figure are considered to provide good coverage of the region, but were mostly obtained before 2007 and entirely before 2012. They do not include extent changes recorded by the two revisit surveys and SAC monitoring: * Smith (2012) recorded loss of the habitat since the original survey at 41 out of 91 sites revisited, and a total loss of 40.8 ha across all the sites (27% of the extent originally mapped at the sites). * Smith et al. (in prep.) recorded a loss in extent of 1.7 ha out of 20.6 ha of the habitat investigated during revisits to 14 sites with the habitat. * SAC monitoring recorded loss of the habitat at one site during the current reporting round (Wilkinson, 2016a), and possible loss (to scrub expansion) at five additional sites during visits within the most recent two reporting rounds (Fowbert et al., 2010; Wilkinson, 2014; Wilkinson, 2015; Wilkinson, 2016b; Wilkinson, 2016c). Note also minor potential deficiencies in the data listed in 2.3.
5.4 Surface area; Method used	see 2.3
5.7 Short term trend; Magnitude	Rate of decrease unknown
5.8 Short term trend; Method used	The results of the site revisit assessments by Smith (2012) and Smith et al. (in prep.) both show decline in the extent of the habitat (see 5.3). Both assessments compare habitat extent between original survey and site revisits. As most of the original survey falls before the short-term trend period, it is not always clear if the loss occurred within or outside the short-term period. Therefore, the assessment of decline is extrapolated and an assessment of the magnitude of decrease not attempted. SAC monitoring within the most recent reporting round recorded loss of the habitat at one site (Wilkinson, 2016a) and possible loss (to scrub expansion) at four additional sites (Wilkinson, 2014; Wilkinson, 2015; Wilkinson, 2016b; Wilkinson, 2016c). It can be assumed that this loss did occur within the short-term period.
5.11 Long term trend; Magnitude	Rate of decrease unknown
5.12 Long term trend; Method used	The results of the site revisit assessments by Smith (2012) and Smith et al. (in prep.) both show decline in the extent of the habitat (see 5.3). Both assessments compare habitat extent between original survey and site revisits. As some of the original survey falls before the long-term trend period, at least some of the loss may have occurred outside the long-term period. Therefore, the assessment of decline is extrapolated and an assessment of the magnitude of decrease not attempted. SAC monitoring within the most recent two reporting rounds recorded loss of the habitat at one site (Wilkinson, 2016a) and possible loss (to scrub expansion) at five additional sites (Fowbert et al., 2010; Wilkinson, 2014; Wilkinson, 2015; Wilkinson, 2016b; Wilkinson, 2016c). It can be assumed that this loss occurred within the long-term period.
5.14 Change and reason for change in surface area	The extent data provided in this reporting round is identical to that provided in 2013. Decline in the extent of the habitat has been recorded (Smith, 2012; Smith et al., in prep.; Wilkinson, 2016a), but has not been used in the calculation of extent in this reporting round due to time constraints (see 2.3).

6.2 Condition of habitat; Method used	Thirteen SACs have been monitored across the period 2007-2017 (Wilkinson, 2014; Wilkinson, 2015; Drewett, 2016; Fowbert et al., 2010; Garrett, 2010; Harrison & Creer, 2009; Wilkinson 2016a; Wilkinson, 2016b; Wilkinson, 2016c; Wilkinson, 2016d; Wilkinson, 2017; Hudson, 2018; Wilkinson, in prep.). Twelve of these were assessed as unfavourable and one favourable during the most recent monitoring; of the unfavourable assessments, three were labelled declining and one recovering. A fourteenth SAC was last monitored in 2006 and assessed as unfavourable (Anon, 2006). Together these monitored SACs have 30% of the habitat extent in Wales. Monitoring has been undertaken on seven non-SAC SSSIs in the past monitoring round; two of these were considered favourable and five unfavourable. Although a limited amount is known about condition for about 68% of the habitat in Wales, Smith (2012) and Smith et al. (in prep.) suggest that non-statutory sites (comprising 39% of the habitat extent in Wales) are largely in poor condition.
6.3 Short term trend of habitat area in good condition; Period	These are the years between the most recent two monitoring visits to SACs with the habitat; comparative data are available for 13 SACs. There is no comparative data for other SSSIs and non-statutory sites with the habitat.
6.5 Short term trend of habitat area in good condition; Method used	Of the thirteen SACs with two sets of monitoring results within the trend period (Harrison & Creer, 2009; Fowbert et al., 2010; Garrett, 2010; Wilkinson, 2014; Wilkinson, 2015; Drewett, 2016; Wilkinson 2016a; Wilkinson, 2016b; Wilkinson, 2016c; Wilkinson, 2016d; Wilkinson, 2017; Hudson, 2018; Wilkinson, in prep.), eleven were assessed as unfavourable during both visits; one changed from unfavourable to favourable and one from favourable to unfavourable. Where classified further, three sites were considered to be declining during the most recent visits and one recovering. However, the monitored SACs comprise only 30% of the total area of the habitat in Wales and there is a lack of trend data for the remaining H6410 resource (SSSIs and non-statutory sites).

7.1 Characterisation of pressures/ threats	Pressures: Data held in NRW's Special Sites Actions Database (NRW, 2017), which provides information on 'issues' affecting habitats and species within the protected sites series in Wales, were used to provide a basis for quantifying pressures/threats relating to the habitat, following procedures outlined in NRW, 2018. The protected sites (SSSI and SAC) hold 61% of the H6410 in Wales by area. Using this method, the following are given a High ranking: A10 (under-grazing) is by far the commonest issue, recorded on 61% of units; L02 (Natural succession) affects 28% of units and relates to scrub expansion; A09 (over-grazing) is an issue on 12% of units; A06 (agricultural abandonment) is an issue on 5% of units. A06 was also highlighted by Smith et al. (in prep.), who noted it as an issue on 10 out of 61 (16%) of non-statutory lowland grassland sites, suggesting that statutory protection significantly increases the chance of some management, although the level of that management may often be insufficient. A02 (Conversion into intensive agriculture) is given a high ranking on the basis of the results from Smith et al. (in prep.), which recorded it at five out of 61 lowland grassland non-statutory sites (8%). This is downgraded to Medium ranking on the JNCC spreadsheet due to there being more than the permitted number of High rankings. A19 (application of natural fertilisers) and A20 (application of artificial fertilisers) are given Medium ranking from the results in Smith et al. (in prep.), as at least some of the five sites converted into intensive agriculture were thought to have included some fertiliser use, although the extent of this is impossible to assess retrospectively. A19 and A20 are downgraded to Low ranking for reporting purposes and consequently have not been formally reported as a pressure. A critical load level of 15-25 kg ha/year of atmospheric nitrogen has been formally allocated to this habitat. Air pollution (N deposition) (J03) is assessed separately using a defined approach (Guest, 2012), using updated deposition data. Using a data overlay method in ARC GIS, 61% of the habitat by area (polygon data) was recorded at or above the lower Critical Load limit and the habitat is given a High ranking. Using methods outlined in NRW, 2018, medium ranking was allocated to: A11 (Burning for agriculture), recorded as an issue on 5% of units; A26 (diffuse pollution from agriculture) on 7% of units; C01 (Extraction of minerals) on 5% of units; and A31 (Drainage for agriculture) on 5% of units. A26 and C01 are reduced to Low ranking for reporting purposes and consequently have not been formally reported as a pressure The assessment of non-statutory sites by Smith et al. (in prep.) indicates that F26 (conversion of marshes to recreational areas) should also be considered Medium ranking pressures. This refers to ponds dug in 5 out of the 61 lowland grassland sites (8%), two of which included direct loss of H6410 habitat. B01 afforestation was recorded at one site by Smith et al. (in prep.) and is given Medium ranking on this evidence and knowledge about other recent examples of planting on species-rich lowland grassland. Using methods outlined in NRW (2018), the following are cited as issues in a very small number of units and are assessed as Low ranking pressures for reporting purposes and consequently have not been formally reported as a pressure: A14 (Supplementary stock feeding); C14 (Water abstraction for resource extraction); D06 (Cables and pipelines); F07 (Sports, tourism & leisure activities), relating to off-road vehicle use; H04 (Arson); H08 (Waste impacts), relating to dumping of material; and I02 (Terrestrial non-native). From Smith et al. (in prep.), Low ranking is allocated to L04 (Natural acidification). Expert judgement is used to give the following Low ranking: A27 (Agricultural activities generating air pollution) F01 (conversion to housing/recreation areas); N02 (Droughts and decreases in precipitation due to climate change); and N03 (Increases in precipitation due to climate change). Threats: These were assessed in a similar way to pressures. However, issues in the Actions Database which were listed as 'complete ' or 'underway' were excluded from the assessment of threats. The results are very similar to those for Pressures, but A26 receives a Low ranking using the set criteria (NRW, 2018), reflecting some recent success in dealing with this issue on H6410 statutory sites. N02 is considered Medium ranking in view of projected increases in summer droughts which could impact this wet grassland habitat but ranked low for reporting purposes. Despite modest projected

	reductions in the overall deposition rates for atmospheric nitrogen, air pollution (J03) is expected to remain a High pressure (threat) to the habitat (Guest, 2012).
8.5 List of main conservation measures	Measures are neither identified nor taken for the majority of the habitat in Wales. Although 61% of H6410 by area is on SSSI, only 51% of SSSI management units with the habitat have an identified or planned action relevant to the habitat. Only about 6% by area of the habitat in Wales is covered by a relevant Glastir grassland option. 32% of H6210 total area occurs on SACs. On sites where the habitat is a SAC feature, Thematic Action Plans have been produced; these provide priorities for each theme. Two sites with small areas of the habitat have been notified as SSSIs since the previous reporting round. 29 additional sites with significant areas of the habitat have been prioritised for SSSI notification and await notification. Site protection has been shown to act as an effective mechanism in preventing conversion into agricultural land (CA01) and preventing or limiting fertiliser and chemical usage (CA09) (e.g. Stevens et al., 2010; Ridding et al. 2017). SSSI management agreements help to maintain extensive agricultural practices (CA03). The majority of Glastir options focused on the habitat are also essentially for maintenance of existing agricultural practise. (Pressure/Threat A02, A09, A10, A19 A20, L02). NRWs Actions Database (NRW, 2017) lists 37 management units with H6410 as a key feature and actions expected to have a positive impact on the habitat in the next 12 years (actions listed as Completed, Underway, Planned or Agreed in principle); 88% of these are listed as completed or underway. The most common actions are: CA05 (44% of all units), mainly adapting grazing management (Pressure/Threat A10); and CI05 (32%), management of problematic scrub species (Pressure/Threat L02 and A10). These are ranked as High. Measures to reduce diffuse pollution from agriculture (CA11) are in place on 7% of management units (Pressure/Threat A26) and CA04 tackling abandonment is listed for 4% of units; these are both ranked Medium. Some Glastir options also focus on restoration of the habitat and thus act to address abandonment (CA04), but the results of Smith et al. (in prep.) suggest that these measures are currently insufficient for non-statutory sites (Pressure/Threat A06). CJ01: The Natura 2000 Thematic Action Plan sets out the policy surrounding air pollution in Wales. There are various air quality strategies and initiatives in place to protect and enhance biodiversity. Air quality limit values set out in the Air Quality Strategy (AQS) are transposed into national legislation by the Air Quality Standards Regulations 2010. Nitrogen deposition, however, is still a major issue on semi-natural habitats in the UK. These regulations are not habitat-specific (NRW, 2015). (Pressure/Threat J03). CB01 Prevent conversion of (semi-) natural habitats into forests is ranked as a Medium. Guidance has been put in place aimed at protecting habitat land from tree planting under Glastir but planting on semi-natural grassland habitat is still occurring and further overarching policy guidance is planned (Pressure/Threat B01). The Actions Database lists a small number of actions for the following Conservation Measures, each given a Low ranking: CA15, management of drainage ditches (Pressure/Threat A31); CC01, relating to managing quarrying activities (Pressure/Threat C01); CF03, relating to recreational activities (Pressure/Threat F07); CF04, relating to control/prevention of dumping of various materials (Pressure/Threat H08); and CI03 management of problematic non-native (Pressure/Threat I02). Two additional Low ranking Conservation Measures are included: CA12, which refers to poultry units which have expanded in number greatly in Wales in recent years - national regulations are in place but have been insufficient to prevent locally increasing ammonia pollution from these units (Pressure/Threat A27); and CF01, which refers to management of developments through planning controls in the context of the enhanced biodiversity duty in the Environment (Wales) Act 2016 (Pressure/Threat F01)

9.1 Future prospects of parameters	A small reduction in range is likely over the next 12 years, given that some 10km squares contain only small areas of the habitat, more vulnerable in some cases by being on non-statutory sites, and given that there have been recent losses in this habitat (see 5.3). The key issue currently facing this habitat is clearly insufficient management, including low grazing levels and abandonment. This can result in loss of key species and often leads to the expansion of scrub across the habitat, thus causing loss of extent. Non-statutory examples of the habitat are being affected by a particularly wide range of Pressures/Threats, including agricultural intensification, drainage and afforestation, although the first two of these appear to have lessened. These Pressures/Threats can all lead to permanent loss of the habitat. About half of SSSI management units lack any conservation measures. Agri-environment coverage (only about 6% of the habitat) is currently inadequate to address management issues across the whole resource. Significant loss of extent of the habitat has been recorded over the long-term trend period (past 24 years) (Smith, 2012; Smith et al., in prep.). Short-term trend is less clear, but there is a strong suggestion of continued loss of lowland grassland on non-statutory sites. The condition on statutory sites is mostly poor, where it has been assessed (see 6.2), to a large extent due to undermanagement. Little is known about the condition of about 68% of the habitat resource, but undermanagement and abandonment appear to be the main issues affecting condition across the resource. Only 51% of SSSI management units have an identified or planned action to address poor condition and only 6% of the habitat in Wales is covered by a relevant Glastir agreement. 61% of the habitat area in Wales currently exceeds the critical load (CL) for atmospheric nitrogen deposition and only a modest projected decrease in total deposition in the Principality is projected over the next 12 years.
11.4 Short term trend of habitat area in good condition within the network; Direction	During the most recent monitoring visits, three SACs were considered to be declining and one recovering; condition was considered unfavourable at 12 out of 13 sites monitored twice in the trend period - one site had moved from favourable to unfavourable, and one from unfavourable to favourable. See 6.5 for details.
11.5 Short term trend of habitat area in good condition within the network; Method used	Thirteen out of the fourteen SACs with the habitat as a qualifying feature have been monitored twice within the trend period, giving a good picture of trend in condition on SACs.