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:

H6210 - Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)

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	**6210 - Semi-natural dry grasslands and scrubland facies on calcareous substra**

2. Maps

2.1 Year or period	1987-2017
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	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. British Geological Survey. 2003. Digital geology data layer DiGMapGB250. BGS dataset. Countryside Council for Wales. 2012. Interpretation of grassland Annex 1 habitats in Wales for 2013 Article 17 reporting. CCW HQ internal document. Creer, J. & Harrison, T. 2009. Halkyn Mountain / Mynydd Helygain SAC. 6210: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). Draft SAC Monitoring report. Creer, J. 2013a. Coedwigoedd Dyffryn Alyn / Alyn Valley Woods SAC UK 0030078. 6210: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) SAC Monitoring report. Creer, J. 2013b. Coedwigoedd Penrhyn Creuddyn / Creuddyn Peninsula Woods SAC UK0030124. 6210: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). SAC Monitoring report. Creer, J. & Green, H. 2013. Berwyn a Mynyddoedd de Clwyd / Berwyn and south Clwyd Mountains SAC. 6210: Semi-natural dry grassland and scrubland facies: on calcareous substrates (Festuco-Brometalia). SAC Monitoring report Creer, J. & Harrison, T. 2013. Pen y Gogarth / Great Orme's Head SAC UK 0014788. 6210: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). SAC Monitoring report Grime, J.P., Fridley, J.D. et al. 2008. Long-term resistance to simulated climate change in an infertile grassland. PNAS 105: 10028-10032. Guest, D. 2012. Assessing N deposition as a pressure for Article 17 reporting on habitats. CCW HQ internal document. Natural England and RSPB, 2014. Climate Change Adaptation Manual. Nature Conservancy Council (NCC). 1990. Handbook for Phase 1 habitat survey. Nature Conservancy Council, Peterborough. Reprinted by the Joint Nature Conservation Committee in 1993 and 2003 with minor amendments. 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.
Rodwell, J.S. (ed.). 1992. British plant communities. Volume 3. Grasslands and montane communities. Cambridge University Press, Cambridge.
Rodwell J.S., Dring J.C., Averis A.B.V., Proctor M.C.F., Malloch A.J.C., Schamin00e9e J.H.J & Dargie T.C.D. 1998. Review of Coverage of the National Vegetation Classification. Lancaster: Unit of Vegetation Science report to the Joint Nature Conservation Committee.
Smith S. 2012. An assessment of a selection of lowland calcareous grasslands in Wales from site visits and aerial photography. CCW HQ internal document.
Smith, S., Birch, K., Bosanquet, S., Guest, D., Westwood, S. Wilkinson, K. & Woodman, J. 2017. A vegetation survey and conservation assessment of the Gower limestone coast SS58/1. NRW Evidence Report no. 188.
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, C.J., Dise, N.B., Mountford, J.O. & Gowing, D.J. 2004. Impact of Nitrogen Deposition on the Species Richness of Grasslands. Science 303: 1876-1879.
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.
Stevens J. & Smith S. 2012. H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia): Wales GIS inventory. NRW HQ dataset Updated 2018.
Sutton, M. 2012. Survey of Stackpole NNR grasslands, heaths, dunes and coast. Natural Resources Wales internal report.
Van Den Berg, L.J.L, Vergeer, P, Rich, T.C.G., Smart, S.M., Guest, D & Ashmore, M.R. 2011. Direct and indirect effects of nitrogen deposition on species composition change in calcareous grasslands. Global Change Biology 17: 1871-1883
Wilkinson, K. 2012. Limestone Coast of South West Wales SAC. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) (known as calcareous grassland). Six sections. SAC Monitoring reports
Wilkinson, K. 2014. Limestone Coast of South West Wales SAC UK (0014787). Feature code (6210): Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). SAC Monitoring report

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	

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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	1987-2017			
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value	7.1279
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	Uncertain (u)			
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	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	0.162	Maximum	0.162
	b) Area in not-good condition (km²)	Minimum	2.6986	Maximum	2.6986
	c) Area where condition is not known (km²)	Minimum	4.2691	Maximum	4.2691
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	2005-2017				
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					

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6.8 Additional information

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Extensive grazing or undergrazing by livestock (A10)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Intensive grazing or overgrazing by livestock (A09)	H
Application of synthetic (mineral) fertilisers on agricultural land (A20)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Problematic native species (I04)	M
Application of natural fertilisers on agricultural land (A19)	M
Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	M
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	M

Threat	Ranking
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Extensive grazing or undergrazing by livestock (A10)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Intensive grazing or overgrazing by livestock (A09)	H
Application of synthetic (mineral) fertilisers on agricultural land (A20)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Problematic native species (I04)	M
Application of natural fertilisers on agricultural land (A19)	M
Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	M
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	M

7.2 Sources of information

7.3 Additional information

8. Conservation measures

8.1 Status of measures

a) Are measures needed? Yes

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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

Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land (CA01)
Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production (CA09)
Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Management of problematic native species (CI05)
Management, control or eradication of other invasive alien species (CI03)
Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures (CA04)
Maintain existing extensive agricultural practices and agricultural landscape features (CA03)
Reduce impact of mixed source pollution (CJ01)

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	2.1536
11.2 Type of estimate	Best estimate	
11.3 Surface area of the habitat type inside the network Method used	Complete survey or a statistically robust estimate	
11.4 Short-term trend of habitat area in good condition within the network Direction	Stable (0)	
11.5 Short-term trend of habitat area in good condition within network Method used	Based mainly on extrapolation from a limited amount of data	
11.6 Additional information		

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

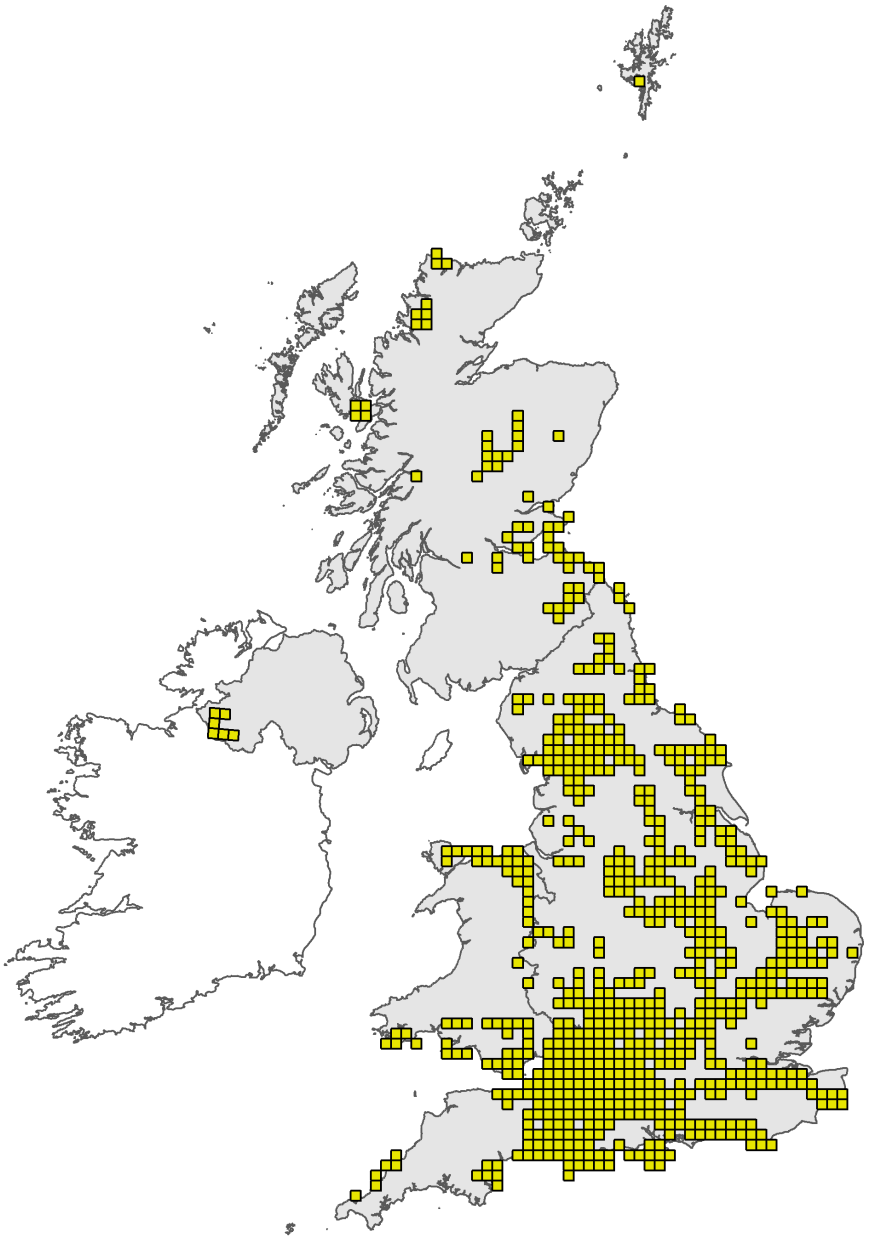

Figure 1: UK distribution map for H6210 - Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). 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

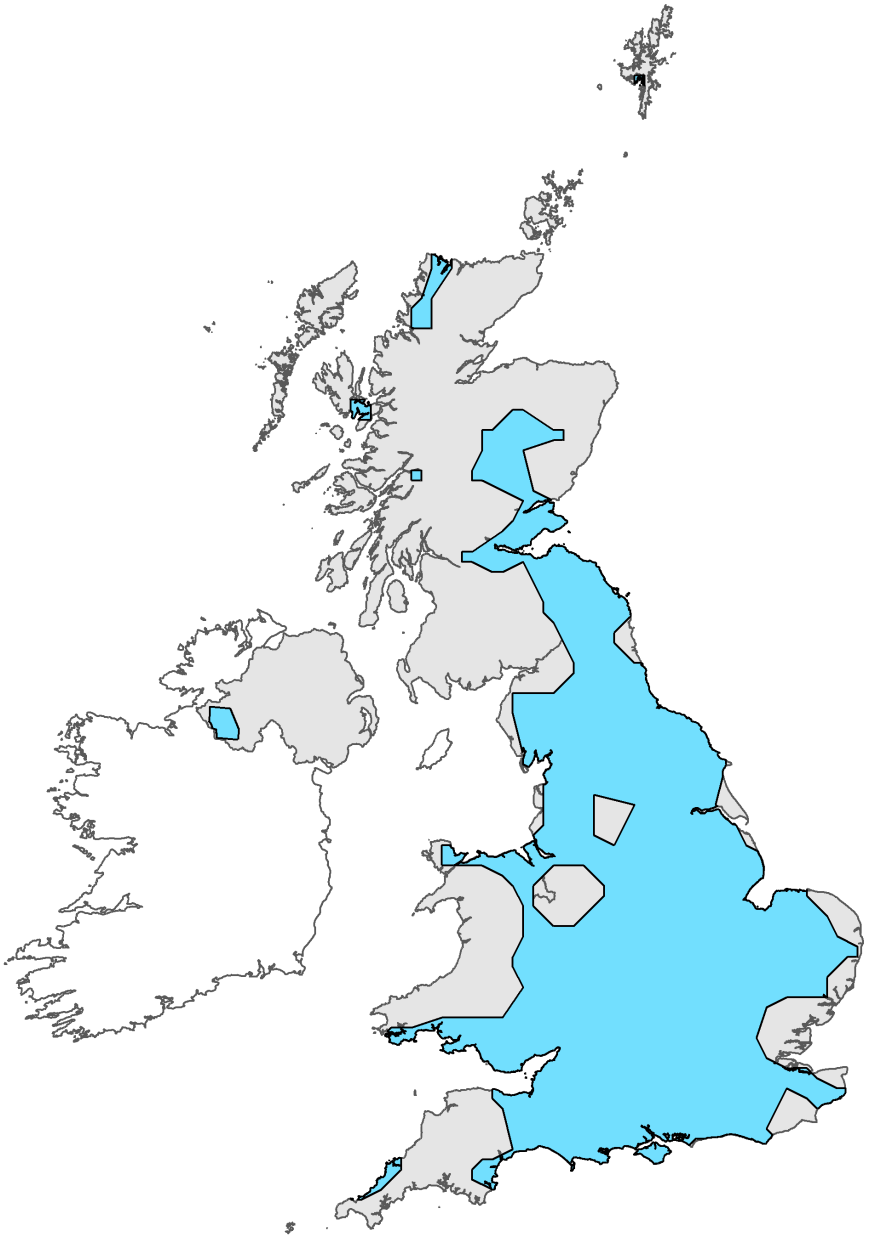

Figure 2: UK range map for H6210 - Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains 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: 6210

Field label	Note
2.3 Distribution map; Method used	The distribution (and extent) of H6210 has been calculated using several data sources, which are summarised below and listed on the 10km Habitat Data spreadsheet. A polygon-based GIS inventory for the habitat has been produced through pooling these data sources together (Stevens & Smith, 2012, with 2018 amendments). Data source 1 (MAIN DATA SOURCE): 'Phase 1' Habitat Survey of Wales (HSW) (Blackstock et al., 2010). This was a comprehensive field-by-field survey of the region; distribution data for this habitat come entirely from the lowland component of the survey, conducted between 1987 and 1997. Phase 1 codes (NCC, 1990) B3 (B.3.1 & B.3.2) calcareous grassland and D.7 dry heath/calcareous grassland mosaic were initially included where they overlie limestone bedrock as defined by British Geological Survey (2003). For D.7, the calcareous grassland area was calculated as 50% of each habitat patch (2 patches only). Further detail on the interpretation of H6210 in Wales can be found in CCW (2012). Data source 2 (MAIN DATA SOURCE): Lowland Grassland Survey of Wales (LGSW) (Stevens et al., 2010). This was a targeted NVC (Rodwell (ed.), 1992) survey focussing on grasslands of high conservation interest in the Welsh lowlands. Survey work was conducted between 1987 and 2004. All occurrences of CG1-9 (except the maritime sub-community CG1f which falls under H1230) on limestone bedrock were included in the definition of H6210, along with a sub-set of CG10 occurrences on limestone (Mesobromion form) and calcareous fringe or 'saum' vegetation with no NVC affiliation (Rodwell et al., 1998). For more details of interpretation of H6210 in Wales see CCW (2012). Data source 3: Amendments and updates to the LGSW database through resurveys and surveys of new sites 2008-2017 (LGSW database). Data source 4: A single locality from the Lowland Peatland Survey of Wales (2008) (LPSW database). Data source 5: Smith (2012) reassessed known 26 sites with the habitat using site visits and aerial photograph interpretation to detect whether any gross change had occurred. Data source 6: Areas of the habitat from a survey of Stackpole, Pembrokeshire (Sutton, 2012). Data source 7: A survey of Gower Limestone Coast using the NVC was undertaken in 2014 (Smith et al., 2017). Data source 8: SAC monitoring confirmed the continued presence and extent of the habitat within four sites during the 2013-18 reporting period (Creer, 2013a; Creer, 2013b; Creer & Green, 2013; Creer & Harrison, 2013; Wilkinson, 2014); two additional SACs were monitored in 2009 and 2012 (Creer & Harrison, 2009; Wilkinson, 2012). Data source 9: One locality surveyed by the LGSW was relocated during a site visit in 2016, when a small reduction in extent since the original survey was recorded (Smith et al., in prep.). Data source 10: Incidental record at one locality (pers. com. R. May, 2017). There are no recent data or information for the majority of localities. Notwithstanding the age of much of the information, together these data give good coverage of the region. Coverage is considered good, as examples of NVC CG1-9 of at least 0.5 ha (on a single site) were specifically targeted for detailed survey by the LGSW, although smaller areas were not always included in this survey.

Habitat code: 6210 Region code: ATL

Field label	Note
4.3 Short term trend; Direction	See 4.11

5.1 Year or period	The data used to produce the total area figure are considered to provide good coverage of the region. However, the data are predominantly from prior to 2007, the two main datasets being from 1987-1997 and 1989-2004. Post 2007 information includes a number of individual site surveys, revisits or interpretation of change using aerial photographs (Smith, 2012; Smith et al., in prep), and SAC monitoring at six sites. See 2.3 for details of datasets.
5.3 Type of estimate	See 2.3
5.3 Type of estimate	The area value provided here is likely to be an over-estimate of the current extent, as there is good evidence of a loss of grassland habitat in general on unprotected sites since the main surveys between 1987 and 2004, as indicated by two site revisit assessments in 2004 (Stevens et al., 2010) and 2017 (Smith et al., in prep). In addition, small losses of H6210 have been detected by Smith (2012) and from occasional site resurveys (see 2.3). However, there is no information on recent area change for most non-statutory examples of the habitat. In providing the estimate, it is not thought that significant numbers of sites have been overlooked, given the complete coverage together provided by the Phase 1 HSW (Blackstock et al., 2010) and Phase 2 LGSW (Stevens et al., 2010) surveys, although examples of the habitat less than 0.5 ha (0.005 km2) in area were not specifically targeted by the LGSW and stands less than 0.1-0.25 ha (0.001-0.0025 km2) were not mapped by the HSW.
5.8 Short term trend; Method used	SAC monitoring covered six SACs within the 2007-2018 period, which together support 29% of the habitat in Wales; no changes in extent were noted during this monitoring , although extent change across the whole feature at these sites was generally not thoroughly assessed (Creer & Harrison, 2009; Wilkinson, 2012; Creer, 2013a; Creer, 2013b; Creer & Green, 2013; Creer & Harrison, 2013; Wilkinson, 2014). Monitoring was undertaken at eight other (non-SAC) SSSIs during the 2007-12 period, one of which had declined slightly in extent (Smith et al., in prep.). Smith et al. (in prep.) noted loss of a broader range of priority lowland grassland habitats at 48% of non-statutory sites (29 out of 61 sites, visited between 2008 and 2017, with an average 9.7 year between visits), and increase in habitat at only 8% of sites, strongly suggesting a recent trend in decline of unprotected lowland grassland habitats generally; however, only a single lowland non-statutory site with H6210 was visited (it showed a decline in extent of the habitat of 0.002 km2),and thus overall it is considered that there is insufficient information on the H6210 habitat to make firm conclussions about recent trend in area.
5.11 Long term trend; Magnitude	Rate of decrease unknown
5.12 Long term trend; Method used	A long-term decrease in the area of the habitat outside statutory protected sites is suggested by three assessments of change at individual sites: 1) revisits to 96 lowland grassland non-statutory sites in 2004 recorded significant decline at 25% of sites (over an average 8-year period) (Stevens et al., 2010); 2) Smith (2012) assessed 26 H6210 sites (20% of the habitat resource by area) and noted loss of the habitat at five sites with disproportionately more loss on non-statutory sites; 3) Smith et al. (in prep.) recorded loss of priority grassland at 48% of non-statutory sites (see 5.8). There is no clear evidence of loss of extent of the habitat on statutory sites. No changes in extent were noted during SAC monitoring during the 1994-2018 period, although extent was generally not thoroughly assessed, and no additional extent changes have been noted during non-SAC SSSI monitoring during the longer period (aside from the decline in extent noted at one site in 5.8). Smith (2012) noted very small decreases in the area of the habitat at two out of 16 SSSIs, but increase in the habitat at three sites.

5.14 Change and reason for change in surface area	The gross reduction in surface area of 0.28 km2 is almost completely due to more accurate data, in particular from the survey of Gower coast (Smith et al., 2017), which recorded a much smaller area of the habitat than the HSW (Blackstock et al., 2010) on which the previous data for this area was based. Conversely, areas of additional habitat were recorded by a few individual site surveys, in particular Sutton (2012). Genuine change in area between reporting rounds is limited to small decreases in habitat recorded e.g. Smith et al. (in prep.) (see 5.3). No change in extent was noted during SAC monitoring (Creer & Harrison, 2009; Creer, 2013a; Creer, 2013b; Creer & Green, 2013; Creer & Harrison, 2013; Wilkinson, 2014), which covers 29% of the habitat in Wales, although extent was not formally assessed. Much of the habitat have had no assessment of change in extent over the short and long term periods (see 2.3 and 5.8).
6.2 Condition of habitat; Method used	The six SACs with the habitat as a qualifying feature (which together have 29% of the habitat extent in Wales) have been monitored across the period 2009-2017 (Creer, J. & Harrison, T. 2009; Wilkinson, 2012; Creer, J. 2013a; Creer, J. 2013b; Creer, J. & Green, H. 2013; Creer, J. & Harrison, T. 2013; Wilkinson, K. 2014), although in some cases only a minor part of the habitat on the site was covered. Each assessment was found to be in unfavourable condition. Monitoring of eleven non-SAC SSSIs with the habitat over the period 2004-13 found two sites in favourable condition and nine in unfavourable condition. There is very little information about habitat condition on non-statutory sites. A visit to one site in 2016 (Smith et al., in prep) noted decline in condition of the habitat (c.20 years since survey). Smith (2012) assessed condition of H6210 at five non-stautory sites, recording it as unfavourable at four sites and favourable at one. Condition is essentially unknown for almost all non-statutory sites and most SSSIs, meaning a lack of information for about 60% of the habitat in Wales.
6.3 Short term trend of habitat area in good condition; Period	These are the years between the most recent and the previous monitoring visits to the SACs with the habitat. There is little trend information for other SSSIs, due to lack of repeat visits, and there has been no structured monitoring on non-statutory sites.
6.5 Short term trend of habitat area in good condition; Method used	b) Based mainly on extrapolation from a limited amount of data The six monitored SAC features have all been assessed as being in unfavourable condition, both in the most recent and the previous monitoring rounds, although this is an indication of the feature in general, which in some cases was not wholly in poor condition. The feature on one out of the six SACs was considered 'declining' during the most recent monitoring and none was considered 'improving'. There is a lack of good trend data for the remaining H6210 resource (SSSIs and non-statutory sites), although the results of Smith (2012) and Smith et al. (in prep.) suggest an overall decline in condition of lowland grassland habitats in general over the past 10 to 15 years (see 5.3).

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 H6210 Wales resource by area. Using this method the following are given a High ranking:, L02 (natural succession) affected 48% of units, A10 (under-grazing) 33%, I02 (alien invasives) 25% and A09 (over-grazing) 11%. I04 (invasive natives, mainly bracken) affects 7% of units and is ranked Medium. As a maximum of only five High pressures are allowed, L02 is reduced to Medium ranking on the JNCC spreadsheet in view of the fact that in many cases 'scrub expansion' might better be included under A10. Information on a sample of non-statutory grassland sites is provided by Smith et al. (in prep.). They recorded cases of artificial fertiliser application (A20) at 5% of lowland grassland sites, and this is given a High ranking as it typically affects whole agricultural units or large areas and is highly destructive. Smith et al. (in prep.) also recorded, more rarely, cases of conversion to intensive production (A02) and Abandonment (A06) - these are given Medium ranking (although A06 has been downgraded to Low for UK reporting purposes, there being too many than the allowed number of Medium pressures). Two additional categories are given Medium ranking from expert opinion: A19 Application of natural fertilisers on agricultural land, as manure application is still common practice in Wales and can be highly destructive, and C01 Extraction of minerals (including quarry working and expansion), as active quarrying of limestone is still occurring in Wales. Air pollution (N deposition) (J03) is known to detrimentally affect the habitat (Stevens et al., 2004; Van Den Berg et al., 2011) and is assessed separately using a defined approach (Guest, 2012), using updated deposition data. Using a data overlay method in ARC GIS, 42% of the habitat by area (polygon data) was recorded at or above the relevant lower Critical Load limit. Lowland calcareous grassland appears to have relatively low sensitivity to climate change (N01, N02, N03) (Grime et al., 2008; Natural England & RSPB, 2014). Other categiories are given Low ranking using data from the Special Sites Actions Database NRW (2017) (A14 - supplementary stock feeding, D06 - dumping & H08 - laying and maintaining power lines), and Smith et al. (in prep.) (B01). Expert judgement is used for the following: Ongoing military activity (H01) is a low pressure on one site in south-west Wales; several of the larger sites with the habitat are affected by recreational pressure and trampling, although the effects are generally localised (F07); some non-statutory examples of the habitat abut built-up land and could be built on (F01). Threats: These were assessed in a similar way to pressures. However, issues in the Actions Database which had been 'completed' or were 'underway' were not included in the assessment of threats. The results are very similar to those for Pressures, but I02 receives a Medium ranking using the set criteria (NRW, 2018), reflecting the high prevalence of completed rather than pending actions tackling non-native species in the Actions Database. 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. A provisional analysis using projected exceedance data for 2030 indicates that the area of SAC (on which H6210 is a feature) which falls in areas where deposition is above the relevant critical load will fall by less than 1% by 2030. An evenly distributed 10% decline in deposition levels would see a fall in the area of exceedance from 42% to 36%.

8.5 List of main conservation measures	Measures are neither identified nor taken for most of the habitat in Wales. Although 61% of H6210 by area is on SSSI, only 59% of SSSI management units with the habitat have an identified action relevant to the habitat. Only about 5% by area of the habitat in Wales is covered by a relevant Glastir grassland option. 29% of H6210 total area is listed as a SAC feature. Thematic Action Plans have been produced for the SACs; these provide priorities for each theme. Two sites with the habitat have been notified as SSSIs since the previous reporting round; together these support 5% of the total extent of the habitat in Wales. Two 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). NRWs Actions Database (NRW, 2017) lists 95 management units with H6210 as a key feature with actions expected to have a positive impact in the next 12 years (actions listed as Completed, Underway, Planned or Agreed in principle); 87% of these are listed as completed or underway. The most common actions are: CI05, Management of problematic native species, mainly either scrub or bracken control (35% of all units with the habitat) (Pressure/Threat L02 and A10), CA05, mainly adapting grazing management (32%) (Pressure/Threat A10), and CI03 (control/eradication of invasive alien species), recorded for 17% of units (Pressure/Threat I02); these are all ranked as High. CA04 takling abandonment is listed for 3% of units and is ranked Medium as conservation measures are essential to prevent ecological succession on ungrazed sites (Pressure/Threat A06). CA03 maintain extensive agricultural practice is also ranked Medium. The large majority of Glastir optins focused on the habitat are essentially for maintenance of existing agricultural practise. Many of the specific actions on SSSIs also essentially also maintain extensive agriculture. (Pressure/Threat A02, A09, A10, A19 A20, L02) 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). The Actions Database lists actions for the following Conservation Measure, each given a Low ranking: CC01, relating to managing quarrying activities (Pressure/Threat C01), CF03, relating to recreational activities (Pressure/Threat F07), and CF04, relating mainly to control/prevention of fly tipping (Pressure/Threat H08). Two additional Low ranking Conservation Measures are included: CB01 (guidance is in place aiming to protect habitat land from tree planting under Glastir) (Pressure/Threat B04); CA12 (national regulations are in place but have been insufficient to prevent locally increasing ammonia pollution from expansion of poultry units.
9.1 Future prospects of parameters	A wide range of Pressures and Threats affect a large proportion of the habitat. Conservation measures to combat these are in place or intended for much, although not all, of the habitat on statutory sites. There is a general lack of known measures for the non-statutory sites, which form 39% of the resource. Glastir coverage is only c.5% of the total habitat. There is limited information on recent trend in area, but some mainly small losses of extent have been recorded on non-statutory sites (Smith, 2012; Smith et al., in prep.) and there is incomplete knowledge for the statutory sites (see 5.8). Overall it is likely that a slow decline in area will continue, but it is unclear if it is < or > 1% per year. Condition on statutory sites is generally poor (see 6.2) and there is limited structure and function information for non-statutory sites. Many Actions on statutory site units have been completed or are set to proceed, but 92 units have actions affecting the habitat which have been identified but are not currently being progressed. 42% 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.