Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A

**2019-2024**

Conservation status assessment for the habitat:

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

**Wales**

Cyfoeth Naturiol Cymru Natural Resources Wales

JNCC

**For further information please contact:**

Natural Resources Wales, Welsh Government Offices, Cathays Park, King Edward VII Avenue, Cardiff, CF10 3NQ. https://naturalresources.wales

JNCC, Quay House, 2 East Station Road, Fletton Quays, Peterborough, PE2 8YY. https://jncc.gov.uk

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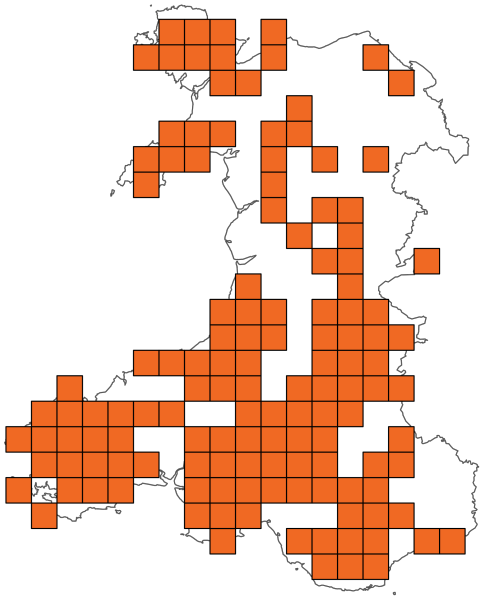
**Important note - Please read**

- The information in this document represents Wales Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A, for the period 2019-2024.
- It is based on supporting information provided by Natural Resources Wales, which is documented separately.
- The Habitats Regulations reporting 2019-2024 Approach Document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- Maps showing the distribution and range of the habitat are included.
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the assessments. Further underpinning explanatory notes are available in the related country reports.
- 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 not relevant to this habitat (section 11 National Site Network coverage for Annex I habitats).

Further details on the approach to the Habitats Regulations Reporting 2019-2024 are available on the JNCC website.

## Assessment Summary: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

### Distribution Map



### Range Map

**Figure 1:** Wales distribution and 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 10km grid square distribution map is based on available habitat records within the current reporting period.

**Table 1:** Table summarising the conservation status for H6410 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*). Overall conservation status for habitat is based on assessments of range, area covered by habitat, structure and functions, and future prospects.

### Overall Conservation Status (see section 10)

**Unfavourable-bad (U2)**

### Breakdown of Overall Conservation Status

| | |
|---|---|
| **Range** (see section 4) | **Favourable (FV)** |
| **Area covered by habitat** (see section 5) | **Unfavourable-bad (U2)** |
| **Structure and functions** (see section 6) | **Unfavourable-bad (U2)** |
| **Future prospects** (see section 9) | **Unfavourable-bad (U2)** |

# List of Sections

# National Level

## 1. General information

| | |
|---|---|
| **1.1 Country** | Wales |
| **1.2 Habitat code** | H6410 - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) |

## 2. Maps

| | |
|---|---|
| **2.1 Year or period** | 1987-2024 |
| **2.2 Distribution map** | Yes |
| **2.3 Distribution map; Method used** | Complete survey or a statistically robust estimate |

**2.4 Additional information**

No additional information

# Biogeographical Level

## 3. Biogeographical and marine regions

**3.1 Biogeographical or marine region where the habitat occurs** ATL

**3.2 Sources of information**

See section 13 References

## 4. Range

| | |
|---|---|
| **4.1 Surface area (km²)** | 19,384.61 |
| **4.2 Short-term trend; Period** | 2013-2024 |
| **4.3 Short-term trend; Direction** | Stable |
| **4.4 Short-term trend; Magnitude** | |

| | |
|---|---|
| **a) Estimated minimum** | |
| **b) Estimated maximum** | |
| **c) Pre-defined range** | |
| **d) Unknown** | |
| **e) Type of estimate** | |
| **f) Rate of decrease** | |
| **4.5 Short-term trend; Method used** | Complete survey or a statistically robust estimate |
| **4.6 Long-term trend; Period** | |
| **4.7 Long-term trend; Direction** | |
| **4.8 Long-term trend; Magnitude** | |
| **a) Minimum** | |
| **b) Maximum** | |
| **c) Rate of decrease** | |
| **4.9 Long-term trend; Method used** | |

**4.10 Favourable Reference Range (FRR)**

| | |
|---|---|
| **a) Area (km²)** | |
| **b) Pre-defined increment** | Current range is less than 2% smaller than the FRR |
| **c) Unknown** | No |
| **d) Method used** | Reference-based approach |
| **e) Quality of information** | moderate |

**4.11 Change and reason for change in surface area of range**

| | |
|---|---|
| **a) Change** | Yes |
| **b) Genuine change** | No |

| | |
|---|---|
| **c) Improved knowledge or more accurate data** | Yes |
| **d) Different method** | No |
| **e) No information** | No |
| **f) Other reason** | No |
| **g) Main reason** | Improved knowledge/more accurate data |

### 4.12 Additional information

No additional information

## 5. Area covered by habitat

| | |
|---|---|
| **5.1 Year or period** | 1987-2024 |
| **5.2 Surface area (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** | 2007-2024 |
| **5.6 Short-term trend; Direction** | Decreasing |
| **5.7 Short-term trend; Magnitude** | |
| **a) Estimated minimum** | |
| **b) Estimated maximum** | |
| **c) Pre-defined range** | |
| **d) Unknown** | Yes |
| **e) Type of estimate** | Best estimate |
| **f) Rate of decrease** | Decreasing <=1% (one percent or less) per year on average |
| **5.8 Short-term trend; Method used** | Based mainly on extrapolation from a limited amount of data |

| | |
|---|---|
| **5.9 Long-term trend; Period** | 1994-2024 |
| **5.10 Long-term trend; Direction** | Decreasing |
| **5.11 Long-term trend; Magnitude** | |
| **a) Minimum** | |
| **b) Maximum** | |
| **c) Confidence interval** | |
| **d) Rate of decrease** | Decreasing <=1% (one percent or less) per year on average |
| **5.12 Long-term trend; Method used** | Based mainly on extrapolation from a limited amount of data |
| **5.13 Favourable Reference Area (FRA)** | |
| **a) Area (km²)** | |
| **b) Pre-defined increment** | Current area is between 26% and 50% smaller than the FRA |
| **c) Unknown** | No |
| **d) Method used** | Reference-based approach |
| **e) Quality of information** | moderate |

**5.14 Change and reason for change in surface area of range**

| | |
|---|---|
| **a) Change** | No |
| **b) Genuine change** | |
| **c) Improved knowledge or more accurate data** | |
| **d) Different method** | |
| **e) No information** | |
| **f) Other reason** | |
| **g) Main reason** | |

### 5.15 Additional information

No additional information

## 6. Structure and functions

### 6.1 Condition of habitat (km²)

| | |
|---|---|
| **Area in good condition** | |
| **ai) Minimum** | 0.087 |
| **aii) Maximum** | 0.087 |
| **Area not in good condition** | |
| **bi) Minimum** | 1.586 |
| **bii) Maximum** | 1.586 |
| **Area where condition is unknown** | |
| **ci) Minimum** | 3.483 |
| **cii) 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** | 2004-2024 |
| **6.4 Short-term trend of habitat area in good condition; Direction** | Uncertain |
| **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

Typical species were not used directly in the assessment of conservation status for habitat structure and function as a comprehensive list of typical species for each habitat was not available. However, the status of typical species was considered when the condition of individual sites was assessed using Common Standards Monitoring Guidance. Common Standards Monitoring (CSM) data was used to assess the area of habitat in 'good' and 'not good' condition (field 6.1). Species were a component of the attributes assessed under CSM. Therefore, an assessment of species is considered to have formed part of the reporting under field 6.1 which supported the Habitats Structure and Function assessment (field 10.3).

## 7. Main pressures

### 7.1 Characterisation of pressures

**Table 2:** Pressures affecting the habitat, including timing and importance/impact ranking. Pressures are defined as factors acting currently and/or during the reporting period (2019–2024). Rankings are: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

| Pressure | Timing | Ranking |
|---|---|---|
| PA05: Abandonment of management/use of grasslands and other agricultural and agroforestry systems (e.g. cessation of grazing, mowing or traditional farming) | Ongoing and likely to be in the future | High (H) |
| PA08: Extensive grazing or undergrazing by livestock | Ongoing and likely to be in the future | High (H) |
| PK04: Atmospheric N-deposition | Ongoing and likely to be in the future | High (H) |
| PM07: Natural processes without direct or indirect influence from human activities or climate change | Ongoing and likely to be in the future | High (H) |
| PA17: Agricultural activities generating pollution to surface or ground waters (including marine) | Ongoing and likely to be in the future | High (H) |
| PA02: Conversion from one type of agricultural land use to another (excluding drainage and burning) | Ongoing and likely to be in the future | High (H) |
| PJ03: Changes in precipitation regimes due to climate change | Ongoing and likely to be in the future | High (H) |

| | | |
|---|---|---|
| PA07: Intensive grazing or overgrazing by livestock | Ongoing and likely to be in the future | Medium (M) |
| PA09: Burning for agriculture | Ongoing and likely to be in the future | Medium (M) |
| PA20: Live stock farming generating pollution | Ongoing and likely to be in the future | Medium (M) |
| PA22: Drainage for use as agricultural land | Ongoing and likely to be in the future | Medium (M) |
| PB01: Conversion to forest from other land uses, or afforestation (excluding drainage) | Ongoing and likely to be in the future | Medium (M) |
| PA13: Application of natural or synthetic fertilisers on agricultural land | Ongoing and likely to be in the future | Medium (M) |
| PL02: Drainage (mixed or unknown drivers) | Ongoing and likely to be in the future | Medium (M) |

### 7.2 Sources of information

See section 13 References

### 7.3 Additional information

No additional information

## 8. Conservation measures

### 8.1: Status of measures

| | |
|---|---|
| **a) Are measures needed?** | Yes |
| **b) Indicate the status of measures** | Measures identified and taken |
| **8.2 Main purpose of the measures taken** | Restore the structure and functions, including the status of typical species (related to ‘Specific structure and functions’) |
| **8.3 Location of the measures taken** | Both inside and outside National Site Network |
| **8.4 Response to measures** | Medium-term results (within the next two reporting periods, 2025–2036) |

### 8.5 List of main conservation measures

**Table 3:** Key conservation measures addressing current pressures and/or anticipated threats during the next two reporting periods (2025–2036). Measures are ranked by importance/impact: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

| Conservation measure | Ranking |
|---|---|
| MA01: Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land | High (H) |
| MA03: Maintain existing extensive agricultural practices and agricultural landscape features | High (H) |
| MA05: Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning) | High (H) |
| MA09: Manage the use of natural and synthetic fertilisers as well as chemicals in agricultural for plant and animal production | High (H) |
| MI05: Management of problematic native species | High (H) |
| MA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures | Medium (M) |
| MK01: Reduce impact of mixed source pollution | Medium (M) |
| MB01: Prevent conversion of (semi-) natural habitats into forests and of (semi-) natural forests into intensive forest plantation | Medium (M) |
| MA13: Manage agricultural drainage and water abstraction (incl. the restoration of drained or hydrologically altered habitats) | Medium (M) |

### 8.6 Additional information

Only part of the measures identified have been taken.

## 9. Future prospects

### 9.1a Future trends of parameters

| | |
|---|---|
| **ai) Range** | Negative - decreasing <=1% (one percent or less) per year on average |
| **bi) Area** | |

| | |
|---|---|
| | Negative - decreasing <=1% (one percent or less) per year on average |
| **ci) Structure and functions** | Very negative - important deterioration |

### 9.1b Future prospects of parameters

| | |
|---|---|
| **aii) Range** | Poor |
| **bii) Area** | Bad |
| **cii) Structure and functions** | Bad |

### 9.2 Additional information

No additional information

## 10. Conclusions

| | |
|---|---|
| **10.1 Range** | Favourable (FV) |
| **10.2 Area** | Unfavourable-bad (U2) |
| **10.3 Specific structure and functions (incl. typical species)** | Unfavourable-bad (U2) |
| **10.4 Future prospects** | Unfavourable-bad (U2) |
| **10.5 Overall assessment of Conservation Status** | Unfavourable-bad (U2) |
| **10.6 Overall trend in Conservation Status** | Deteriorating |

### 10.7 Change and reason for change in conservation status

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

### 10.7 Change and reason for change in conservation status trend

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

### 10.8 Additional information

No additional information

## 11. UK National Site Network (pSCIs, SCIs, SACs) coverage for Annex I habitat types

### 11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (km²)

| | |
|---|---|
| **a) Minimum** | |
| **b) Maximum** | |
| **c) Best single value** | 1.642 |
| **11.2 Type of estimate** | Minimum |
| **11.3 Habitat area inside the network; Method used** | Complete survey or a statistically robust estimate |
| **11.4 Short-term trend of habitat area within the network; Direction** | Decreasing |
| **11.5 Short-term trend of habitat area within the network; Method used** | Based mainly on extrapolation from a limited amount of data |
| **11.6 Short-term trend of habitat area in good condition within the network; Direction** | Decreasing |
| **11.7 Short-term trend of habitat area in good condition within the network; Method used** | Based mainly on extrapolation from a limited amount of data |

### 11.8 Additional information

No additional information

## 12. Complementary information

### 12.1 Justification of percentage thresholds for trends

No justification information

### 12.2 Other relevant information

No other relevant information

# 13. References

## Biogeographical and marine regions

### 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 Môn / 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.

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

Hammond, C. 2023. Cwm Cadlan SAC Purple moor-grass meadow desk-based evaluation 2023-03-31. NRW 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.

Rawlins, K. 2022. Cadair Idris SAC Purple moor-grass meadow desk-based evaluation 2022-03-02. NRW internal document.

Rodwell, J.S. (ed.). 1991. British plant communities Volume 2. Mires and heaths. Cambridge University Press, Cambridge.

Natural Resources Wales. 2015. Natura 2000 Thematic Action Plan. Air pollution: Nitrogen deposition. LIFE Natura 2000 Programme for Wales.

Natural Resources Wales. 2018. Briefing Note. Article 17, 2013-18: Pressures, threats and conservation measures guidance. Internal NRW document.

Natural Resources Wales. 2024a. Interpretation of Annex 1 grassland habitats in Wales for 2024 reporting. NRW internal document.

Natural Resources Wales. 2024b. SAFLE: NRW statutory sites actions database. Internal data source.

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.). 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.

Staddon, P.L., Thompson, P & Short, C. 2023. Re-evaluating the sensitivity of habitats to climate change. NECR478. Natural England.

Stevens, J. & Smith, S. 2012. H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae): Wales GIS inventory. CCW HQ dataset. Updated 2025.

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.

Sutton, M. 2022. NVC Survey of Cernydd Carmel, Carmel, Ammanford Carmarthenshire. Wyndrush Wild report for Natural Resources Wales.

Turner, A. 2013. GIS assessment of extent of Purple Moor-Grass and Rush Pasture habitat of principle Importance in Wales. NRW internal data.

UK Government. 2010. The Air Quality Standards Regulations 2010. Available from: https://www.legislation.gov.uk/uksi/2010/1001/contents

Welsh Government. 2023. The Agriculture (Wales) Act 2023. Available from: https://www.gov.wales/agriculture-wales-act-2023

Welsh Government. 2024a. The Clean Air Plan for Wales 2024. Available from: https://www.gov.wales/clean-air-plan-wales-healthy-air-healthy-wales

Welsh Government. 2024b. The Environment (Air Quality and Soundscapes) (Wales) Act 2024. Available from: https://www.legislation.gov.uk/asc/2024/2/contents

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.

## Main pressures

### 7.2 Sources of information

No sources of information

## 14. Explanatory Notes

| Field label | Note |
| --- | --- |
| 2.3: Distribution map; Method used | The distribution (and extent) of H6410 was calculated using four data sources, which are summarised below. A polygon-based GIS inventory for the habitat was produced for the previous two Article 17 reporting rounds through pooling these data sources (Stevens & Smith, 2012), and this was amended to account for additional H6410 records. The bulk of the underpinning habitat survey work summarised below was conducted before 2005.<br><br>Data source 1 (main data source): NRW Lowland Grassland Survey of Wales (LGSW) (main tranche of survey: 1987 to 2004 (Stevens et al., 2010); includes a few more recent sites). This is a targeted National Vegetation Classification (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.<br><br>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.<br><br>Data source 2: NRW 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 2024 were included in the inventory where they do not correspond with habitat H7210, which is largely defined by the presence of Cladium mariscus (see NRW, 2024) for details of habitat interpretation). No examples of M26 have been recorded by this survey.<br><br>Data source 3: Countryside Council for Wales 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).

Data source 4: NVC survey of Cernydd Carmel (Sutton, 2022).

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.

Incidental data/information on changes in H6410 habitat compiled since 2012 has not always 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 2007 and 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).<br><br>d) No SAC monitoring visits were undertaken in the current reporting round, but two H6410 'desk studies' were undertaken (Rawlins, 2022; Hammond, 2023).<br><br>Together, these data/information strongly 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).<br><br>For details of interpretation of H6410 in Wales see NRW (2024a). |
| 4.3: Short-term trend; Direction | See 4.11 |
| 4.11: Change and reason for change in surface area of range | The change in range is due to the recent location of some H6410 habitat outside the previously recorded range during NRW in-house grassland survey. |
| 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 2005, the main dataset being from 1989 and 2004. That and the more recent data used in the area assessment are summarised in 2.3, noting minor potential deficiencies in the different datasets used. Recent (post-2018) data are not included in the surface area figure due to time constraints. |
| 5.4: Surface area; Method used | See 2.3 |
| 5.7: Short-term trend; Magnitude | Rate of decrease uncertain but probably less than 1% per annum. |
| 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. 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 any loss occurred within or outside the short-term period. Smith (2012) recorded loss of M24 at 28 |

| | |
|---|---|
| | sites (37% of sites visited) following separate survey visits between 2001 and 2012, and a total area lost of 18.8ha.<br><br>Appearing to corroborate the above results, an assessment of change in area of marshy grassland habitat (which includes most H6410) using aerial photograph comparison by Turner (2013) estimated a loss of marshy grassland area of just under 22% over a 20 to 25 year period up to 2013, although rate of loss per year appeared to lesson, to around 0.5 ha, between 2006 and 2013.<br><br>Similarly, SAC monitoring within the last 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. No structured monitoring of H6410 in SACs has taken place in this reporting round. |
| 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 5.8). 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. Smith (2012) recorded loss of M24 at 42 sites (46% of sites visited) following separate survey visits between 1989 and 2012, and a total area lost of 40.8ha.<br><br>The assessment by Turner (2013) (see 5.8) encompasses most of the long-term period and estimates a loss of around 1% per annum of marshy grassland. As H6410 is better represented on statutory protected sites than marshy grassland as a whole (Smith, 2020), it is likely, although not certain, that loss of H6410 over that period is somewhat lower than 1% per year. |

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| | SAC monitoring within the two previous 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. No structured monitoring of H6410 in SACs has taken place in this reporting round. |
| 5.14: Change and reason for change in surface area | The same surface area as in 2018 is presented here due to lack of time to provide an update. |
| 6.2: Condition of habitat; Method used | Thirteen SACs with H6410 had structured monitoring 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). No structured monitoring on the habitat took place in the current reporting round; however, two SACs received 'desk-based assessments', both of which reached unfavourable conclusions (Rawlins, 2022; Hammond, 2023). Together these monitored SACs have 30% of the habitat extent in Wales.<br><br>A total of ten non-SAC SSSIs received 'light touch' monitoring of their marshy grassland feature (which included some H6410); eight of these had an unfavourable conclusion and two were recorded as 'unknown'.<br><br>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 |

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| | 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 years encompass the past two structured monitoring assessments and the most recent evaluations (including desk-base assessments). |
| 6.5: Short-term trend of habitat area in good condition; Method used | Of the thirteen SACs with two sets of full structured 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. Four sites were further classified either as declining (three sites) or recovering (one site) during the most recent visits.<br><br>Recent desk-based assessment of H6410 at two of the SACs also reached unfavourable conclusions (Rawlins, 2022; Hammond, 2023).<br><br>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 apart from 'light touch' assessments of marshy grassland (including some H6410) on ten SSSIs, eight of which reached unfavourable conclusions and two 'unknown'. |
| 7.1: Characterisation of pressures | Data held in SAFLE, NRW's statutory sites database (NRW, 2024), 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 relating to the habitat, following procedures outlined in NRW, 2018. The protected sites (SSSI and SAC) hold 66% of the H6410 in Wales by area. Using this method, the following are given a High ranking: PA08 (under-grazing) is by far the commonest issue, recorded on 79% of units (an increase from 61% in the last reporting round); PM07 (Natural succession) affects 42% of |

units and relates to scrub expansion (again up from 28% in the last reporting round); PA17 (agricultural source water pollution) is listed for 54 units (47%).

PA05 (abandonment) is only highlighted as an issue for 3% of management units, but 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 at least some management, although the level of that management may often be insufficient.

PA02 (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%).

A lower Critical Load level of 10 kg ha/year of atmospheric nitrogen has been formally allocated to this habitat. Air pollution (N deposition) (PK04) is assessed separately using the agreed approach and updated deposition data. Using a data overlay method in ARC GIS, 82% 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.

PJ03 (changes in precipitation regimes due to climate change) is also given a high ranking. Purple moor-grass and rush pasture habitats, of which H6410 forms a part, are assessed as having 'relatively high sensitivity to climate change', largely due to sensitivity to drought and hydrological changes (Staddon et al., 2023).

PA07 (over-grazing) is an issue on 4% of units, compared to 12% in the last reporting round, and is given medium ranking (high last time). PL02 (drainage – unknown drivers) is also given a medium ranking, in reference to inappropriate drainage (including insufficient drainage), recorded on 8% of units.

PA13 (application of fertilisers) is 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.

PA20 is given a medium ranking to reflect the impact of ammonia emissions from agriculture (particularly intensive poultry units and dairy) on semi-natural grassland habitats.

Using methods outlined in NRW, 2018, medium ranking was also allocated to: PA09 (Burning for agriculture), recorded as an issue on 11% of units; and PA22 (Drainage for agriculture) on 22% of units.

The assessment of non-statutory sites by Smith et al. (in prep.) indicates that PF13 (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.

PB01 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, including on H6410.

Using methods outlined in NRW (2018), the following are cited as issues in <5% of units and are assessed as low ranking pressures: PC01 (Extraction of minerals), PC12 (water abstraction), PF05 (leisure activities, including use of off-road vehicles), PH04 (arson), PI01 (INNS EU listed), PI02 (INNS non-EU listed), PI03 (problem native), PK05 (mixed source soil pollution).

Expert judgement is used to give the following low ranking: PA10 (in reference to supplementary feeding), PA18

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| | (Agricultural activities generating air pollution) and PF13 (conversion to housing/recreation areas). |
| 8.5: List of main conservation measures | Measures are neither identified nor taken for most of the habitat in Wales. Although 66% of H6410 by area is on SSSI, only 52% of SSSI management units with the habitat have actions which are completed or underway. Measures are not taken for most non-statutory sites; only about 9% by area of the habitat in Wales is covered by a relevant Glastir grassland option.<br><br>35% of H6410 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.<br><br>NRWs SAFLE statutory sites database (NRW, 2024b) lists 65 management units with H6410 as a feature with actions expected to have a positive impact in the next 12 years (those listed as Completed, Underway, Planned or Agreed in principle); 93% of these are listed as completed or underway. The most common measure are: MA05 adapt grazing management (43 units) and MI05, Management of problematic native species (mainly scrub control) (28 units), which are given a high rating.<br><br>Three sites with areas of H6410 (together totalling 4.5 ha) have been notified as SSSIs since the previous reporting round. A number of 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 (MA01) and preventing or limiting excessive fertiliser and chemical usage (MA09) (e.g. Stevens et al., 2010; Ridding et al. 2017). These are therefore given a high rating.<br><br>SSSI management agreements help to maintain extensive agricultural practices (MA03), and this is also given a high rating. The majority of Glastir options focused on the habitat also function to maintain existing agricultural |

practise.

Medium ranking is given to the following based on assessment using NRWs SAFLE statutory sites database (NRW, 2024b): MA04 addressing abandonment (4 units) and MA13 managing agricultural drainage (7 units).

Low ranking is given to the following based on assessment using NRWs SAFLE statutory sites database (NRW, 2024b): MI02 invasive non-native species of union concern (1 unit), MI03 other invasive non-native species (3 units), MA14 other agricultural measures (referring here to farm vehicle use and dumping of farm material) (4 units), and MA10 reducing point source agricultural pollution to ground water (3 units).

Some Glastir options focus on restoration of the habitat and thus act to address abandonment (MA04), but the results of Smith et al. (in prep.) suggest that these measures are currently insufficient for non-statutory sites.

MK01: 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 continues to impact semi-natural habitats in Wales. These regulations are not habitat-specific, however with introduction of The Environment (Air Quality and Soundscapes) (Wales) Act 2024 in Wales, brings in new national targets for air quality pollutants, with the potential of directly influencing habitat protection.

This key legislative advancement requires mandatory targets for fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) to be established by February 2027, including new powers for Welsh Ministers to set pollutant-specific targets in future years (e.g., ammonia, nitrogen dioxide) linked to biodiversity outcomes, potentially

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| | enabling future habitat-sensitive thresholds.<br><br>Welsh Government have also introduced The Agriculture (Wales) Act in 2023. It aims to establish a framework of Sustainable Land Management (SLM) objectives to underpin agricultural support, including the Sustainable Farming Scheme (SFS). The Act provides Welsh Ministers with the power to provide support (financial or otherwise) for or in connection with 15 purposes, including 'Improving air quality'. Welsh Government published a consultation on the SFS which closed in March 2024. Welsh Ministers will not be making final scheme design decisions until further stakeholder work is undertaken.<br><br>MB01 Prevent conversion of (semi-) natural habitats into forests is ranked as medium. This recognises measures aimed at preventing planting on grassland priority habitat under the Woodland Creation Planning Scheme (formerly Glastir Woodland Creation), which currently encompasses most new tree planting in Wales.<br><br>Two additional Low ranking Conservation Measures are included: MA11, 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; and MF01, which refers to management of developments through planning controls in the context of the enhanced biodiversity duty in the Environment (Wales) Act 2016. |
| 9.1:Future trends and prospects of parameters | Range:<br><br>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).<br><br>Area: |

Revisits to known H6410 sites and SAC monitoring over the past 20 year indicate a trend of decline in extent (see 5.8), although there is a substantial lack of data from the current reporting round.

The key issue currently facing this habitat is clearly insufficient management, including low grazing levels and abandonment. This typically leads to the expansion of scrub across the habitat, thus causing loss of extent.

Non-statutory examples of H6410 (34% by area) are being affected by a particularly wide range of pressures, including agricultural intensification, drainage and afforestation, although the first two of these are thought to have lessened. These pressures can all lead to permanent loss of the habitat.

Just under half of SSSI management units lack any conservation measures. Agri-environment coverage (only just over 9% of the habitat) is currently inadequate to address management issues across the whole resource.

Overall it is likely that a slow decline in area will continue, but it is unclear if it is < or > 1% per year.

Structure & function:

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 are the main issues affecting condition across the resource. Only 56% 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.

82% of the habitat area in Wales currently exceeds the

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| | critical load (CL) for atmospheric nitrogen deposition. The Future prospects for Structure and functions takes into account that at least 25% of the habitat area is expected to be in unfavourable (not good) condition in c.2035 due to nutrient N critical load exceedance, unless additional measures are taken to reduce N deposition impacts. |
| 10.1: Range | Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is stable; and (ii) the current Range surface area is approximately equal to the Favourable Reference Range. |
| 10.2: Area | Conclusion on Area reached because:(i) the short-term trend direction in Area is decreasing by 1% per year or less; and (ii) the current Area is more than 10% below the Favourable Reference Area. |
| 10.3: Specific structure and functions | Conclusion on Structure and function reached using the precautionary principle because: i) habitat condition data indicates that more than 25% of the habitat is in unfavourable (not good) condition; and ii) short-term trend in area of habitat in good condition is uncertain for this habitat. |
| 10.4: Future prospects | Conclusion on Future prospects reached because: (i) the Future prospects for Range are poor; (ii) the Future prospects for Area covered by habitat are bad; and (iii) the Future prospects for Structure and function are bad. |
| 10.5: Overall assessment of Conservation Status | Overall assessment of Conservation Status is Unfavourable-bad because three of the conclusions are Unfavourable-bad. |
| 11.4: Short-term trend of habitat area within the network; Direction | SAC monitoring within the previous 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. No structured monitoring of H6410 in SACs has taken place in this reporting round. |
| 11.5: Short-term trend of habitat area within | Thirteen out of the fourteen SACs with the habitat as a qualifying feature were monitored twice within the trend |

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| the network; Method used | period. However, no new monitoring of H6410 took place on SACs in the current reporting round. |
| 5.13: Favourable Reference Area (FRA) | The UK-level FRV for surface area was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive reports and reflects the full rationale used for the 2019 Article 17 reporting. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current habitat extent and trends.<br><br>Loss of the habitat is shown by a number of sources. Smith (2012) recorded loss of H6410 at 42 sites (46% of sites visited) following separate survey visits between 1989 and 2012, and a total area lost of 40.8ha. An assessment of change in area of marshy grassland habitat (which includes most H6410) using aerial photograph comparison by Turner (2013) estimated a loss of marshy grassland area of just under 22% over a 20 to 25 year period up to 2013. SAC monitoring between 2012-2018 recorded loss of the habitat at one site and possible loss at four sites. ERAMMP (2025) reports that fen, marsh & swamp has lost plant diversity, has an increased grass:forb ratio, increased soil compaction by 27%, and has lost 45% of butterfly abundance and 58% of butterfly species richness. |
| 4.10: Favourable Reference Range (FRR) | The UK-level FRV for range was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive reports and reflects the full rationale used for the 2019 Article 17 reporting. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current distribution and trends. |