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

2019-2024

Conservation status assessment for the habitat:

H7230 - Alkaline fens

Wales

Cyfoeth Naturiol Cymru
Natural Resources Wales

JNCC

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This report was produced by JNCC in collaboration with Natural Resources Wales.

This document should be cited as:

Natural Resources Wales and JNCC. (2026). Conservation status assessment for the habitat: H7230 Alkaline fens.

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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: Alkaline fens

Distribution Map

Range Map

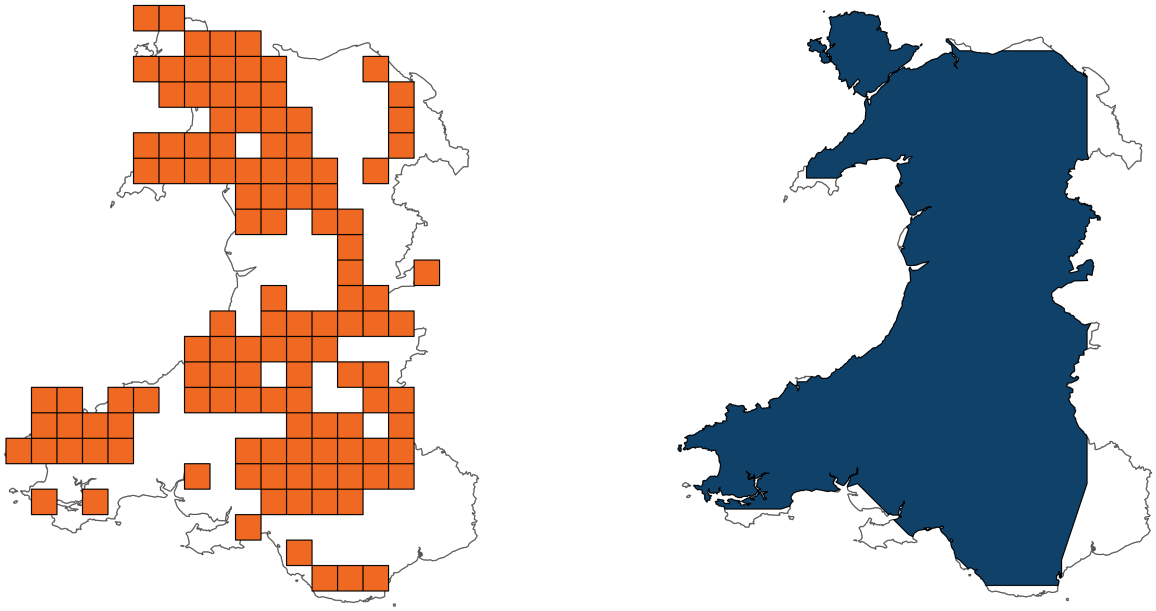

Figure 1: Wales distribution and range map for H7230 - Alkaline fens. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available habitat records within the current reporting period.

Table 1: Table summarising the conservation status for H7230 - Alkaline fens. 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)	**Unfavourable-inadequate (U1)**
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	H7230 - Alkaline fens

2. Maps

2.1 Year or period	1979-2014
2.2 Distribution map	Yes
2.3 Distribution map; Method used	Based mainly on extrapolation from a limited amount of data

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)	18,750.95
4.2 Short-term trend; Period	2013-2024
4.3 Short-term trend; Direction	Decreasing
4.4 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
4.5 Short-term trend; Method used	Based mainly on expert opinion with very limited data
4.6 Long-term trend; Period	2000-2024
4.7 Long-term trend; Direction	Decreasing
4.8 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Rate of decrease	
4.9 Long-term trend; Method used	Based mainly on expert opinion with very limited data

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	Yes

c) Improved knowledge or more accurate data	No
d) Different method	No
e) No information	No
f) Other reason	No
g) Main reason	Genuine change

4.12 Additional information

No additional information

5. Area covered by habitat

5.1 Year or period	1979-2024
5.2 Surface area (km²)	
a) Minimum	
b) Maximum	
c) Best single value	1.387
5.3 Type of estimate	Best estimate
5.4 Surface area; Method used	Based mainly on extrapolation from a limited amount of data
5.5 Short-term trend; Period	2007-2024
5.6 Short-term trend; Direction	Decreasing
5.7 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	Decreasing 0 - 12%
d) Unknown	No
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 expert opinion with very limited data
5.9 Long-term trend; Period	1979-2024
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 expert opinion with very limited 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	Yes
b) Genuine change	Yes
c) Improved knowledge or more accurate data	No
d) Different method	No
e) No information	No

f) Other reason	No
g) Main reason	Genuine change

5.15 Additional information

No additional information

6. Structure and functions

6.1 Condition of habitat (km²)

Area in good condition

ai) Minimum	0.033
aii) Maximum	0.033

Area not in good condition

bi) Minimum	0.519
bii) Maximum	0.519

Area where condition is unknown

ci) Minimum	0.835
cii) Maximum	0.835

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	2013-2024
6.4 Short-term trend of habitat area in good condition; Direction	Decreasing
6.5 Short-term trend of habitat area in good condition; Method used	Based mainly on expert opinion with very limited data

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).

In the case of M13 on Corsydd Mon, there does appear to be an increasing incidence of algal colonies on Schoenus tussocks, sometimes associated with patches of the non-native bryophyte Campylopus introflexus, though this is not especially noted as a nitrophile.

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)
PA17: Agricultural activities generating pollution to surface or ground waters (including marine)	Ongoing and likely to be in the future	High (H)
PA21: Active abstraction of water for agriculture	Ongoing and likely to be in the future	High (H)

PA22: Drainage for use as agricultural land	Ongoing and likely to be in the future	High (H)
PL05: Modification of hydrological flow (mixed or unknown drivers)	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)
PA01: Conversion into agricultural land (excluding drainage and burning)	Ongoing and likely to be in the future	High (H)
PI02: Other invasive alien species (other than species of Union concern)	Ongoing and likely to be in the future	Medium (M)
PC12: Abstraction of surface and ground water for resource extraction	Ongoing and likely to be in the future	Medium (M)
PJ03: Changes in precipitation regimes due to climate change	Ongoing and likely to be in the future	Medium (M)
PD05: Development and operation of energy production plants (including infrastructure)	Only in 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	Long-term results (after 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
MA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	High (H)
MM01: Management of habitats (others than agriculture and forest) to slow, stop or reverse natural processes that occur without direct or indirect influence from human activities or climate change	High (H)
MA10: Reduce/eliminate point or diffuse source pollution to surface or ground waters (including marine) from agricultural activities	High (H)
MK03: Restoration of habitats impacted by multi-purpose hydrological changes	High (H)
MA13: Manage agricultural drainage and water abstraction (incl. the restoration of drained or hydrologically altered habitats)	High (H)
MJ02: Implement climate change adaptation measures	High (H)
MI01: Early detection and rapid eradication of invasive alien species of Union concern	High (H)
MA01: Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land	Medium (M)
MC01: Adapt/manage extraction of non-energy resources	Medium (M)
MK01: Reduce impact of mixed source pollution	High (H)
MC09: Manage/reduce/eliminate air pollution from resource exploitation and energy production	Medium (M)
MA11: Reduce/eliminate air pollution from agricultural activities	High (H)
MA12: Reduce/eliminate soil pollution from agricultural activities	High (H)

8.6 Additional information

No additional information

9. Future prospects

9.1a Future trends of parameters

ai) Range	Unknown
bi) Area	Negative - decreasing <=1% (one percent or less) per year on average
ci) Structure and functions	Negative - slight/moderate deterioration

9.1b Future prospects of parameters

aii) Range	Unknown
bii) Area	Bad
cii) Structure and functions	Bad

9.2 Additional information

No additional information

10. Conclusions

10.1 Range	Unfavourable-inadequate (U1)
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	0.55
11.2 Type of estimate	Best estimate
11.3 Habitat area inside the network; Method used	Based mainly on extrapolation from a limited amount of data
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 expert opinion with very limited 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 expert opinion with very limited 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

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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 map provided for this habitat dates from 2018 with no revision and is a slightly revised version of the map for this habitat developed for the 2013 Article 17 reporting round (Stevens, 2012a), with four new hectads added from the Lowland Peatland Survey of Wales (LPSW) (Jones et al., 2011) for SH37, and the Lowland Grassland Survey of Wales (LGSW) (Stevens et al., 2010) for SH24, SH68, & SN44. The definition of this habitat is considered in more detail in Stevens (2012) and Jones et al (2012). The distribution map is based on GIS analysis of Phase 2 (plant community level) and Phase 1 data. Phase 2 mapping yields polygon records assigned to NVC communities/sub-communities and non-NVC units mapped to 1:2500 and transferred to a Mapinfo and then subsequently an ArcGIS platform. Polygons (whether relating to individual vegetation types or mosaics) for plant communities/sub-communities judged as conforming to this habitat have been selected and used to create a GIS inventory for this habitat. It is anticipated that most hectad occurrences of the NVC community M13 Schoenus nigricans mire in Wales have been captured in the data presented here: coverage for the lowland SAC resource for this key component of alkaline fen is believed to be near complete. However, many lowland sites (particularly highly vulnerable non-statutory examples) remain un-surveyed, so information on extent is incomplete. Many examples of M10 still lack survey coverage. The 2018 map is based on the 2707 records ('records' in this context refer to individual pure or mixed polygons containing this habitat and based on field mapping evidence) for H7230 from the 2012 inventory, together with a further 54 records from the LGSW and LPSW (2761 in total). These 'new' records are a blend of genuinely new

records resulting from field survey undertaken since 2012, as well as records for H7230 plant communities recorded by the LGSW which were not included in the 2012 inventory. The main record elements are described further below.

M9 (136 records, 1989-current).

Records for M9 from the LPSW for data up until 2012 were accepted from the following contexts: all soligenous fen or alkaline flush records and records for topogenous or unclassified fen, but only where lacking Cladium mariscus (the presence of Cladium would indicate placement in H7210). This resulted in 118 records. Records for M9 from the LGSW were not included in 2012. A further 18 M9 records have been added through inclusion of the Lowland Grassland Survey of Wales records (12 records, 1989-2003) and a further 6 LPSW records spanning the date range 2000-2014. Records included since 2012 include stands of M9 in all contexts.

M10 (1775 records, 1987-current). Data for the 2012 report included all records for the M10 Carex dioica – Pinguicula vulgaris mire community collected by the Lowland Grassland Survey of Wales 1987 - 2004 (Stevens et al., 2010) – 1338 records, the Lowland Peatland Survey of Wales 2004 – ongoing (Jones et al., 2011) – 144 records, the Lowland Heathland Survey of Wales 1993-2001 (Sherry, 2007) – 12 records, and Phase 2 (community level) surveys of upland vegetation undertaken for the following sites: Mynydd Eglwyseg (2002) – 6 records, Glydeiriau (1996-1998 & 2002) – 70 records, Mynydd Llangatwg-Mynydd Llangynidr (2003) – 27 records, Migneint – Dduallt (2002) – 19 records, Mynydd Preseli SSSI (2004-5) – 107 records, Brecon Beacons SSSI (2004) – 4 records, Carneddau (2002) – 38 records, Elenydd (1994-2000) – 6 records – see Stevens (2012a) for further details. The 2018 report includes 4 additional records from the Lowland Peatland Survey of Wales. In essence, M10 is

regarded as conforming to H7230 in all ecological situations. This is the most widely distribution element of H7230 in Wales and accounts for a majority of the hectad records.

M13 (787 records 2004-current). Data for the 2012 reporting round were confined to 684 records from the Lowland Peatland Survey of Wales, and included all examples in soligenous contexts and all topogenous and unclassified examples where lacking Cladium mariscus (the latter would indicate placement in H7210 instead). M13 records for the Lowland Grassland Survey of Wales were not considered in 2012 but these have now been added, contributing a further 13 records for examples of this plant community in all contexts. Some records for M14 have also been included.

Basic flush (E.2.2) (Lowland component of Phase 1 Survey, 1987-1997, 55 records).

Records for basic flush (E.2.2) for the lowland element of the Habitat Survey of Wales (Blackstock et al., 2010) were used, subject to comparison of polygons against the Phase 1 scans to make sure they were coded 'B' (basic) in the original map (Stevens, 2012a). This data-source yielded 55 records. There is some concern that this might include habitat falling outside the Annex I definition, but even if this is sometimes the case the amount is unlikely to be significant.

Ratcliffe & Birks categories H3F, H3G (Upland Vegetation Survey component of Phase 1 Survey, 1979-1989):

Data used here also include upland records for two Birks & Ratcliffe (1980) communities from the Upland Vegetation Survey of Wales (included as part of the overall Habitat Survey of Wales, Blackstock et al., 2010a), namely H3f Carex nigra – brown moss communities (included in the lists of synonyms for M10 by Averis et al., 2004) and H3g

	sub-montane Carex rostrata – brown moss mire (~M9 sensu Averis et al). These data amounted to 13 records for the following sites; Black Mountains, Brecon Beacons, Cothi Twyi & Mynydd Mallaen, Halkyn Mountain, Berwyn, the Arans, and Cadair Idris. Other sources of recent evidence were checked to determine if further hectad records could be added. Survey work in support of the Wylfa Newydd application on Anglesey (Horizon Nuclear Power, 2018) has yielded important new site records for M13, but no new hectads. Phase 1 data was only used where NVC survey information was lacking and the overwhelming majority of records (2693 or 97.5%) are based on high quality Phase 2 (plant community [NVC] level) survey undertaken in-house as part of the LGSW and LPSW programmes, and as part of the mainly out-sourced Lowland Heathland and Upland Habitat NVC Surveys. All of the Phase 2 data post-dates 1987. The LPSW is still ongoing and further significant lowland records for this habitat will arise leading up to completion of the Lowland Peatland Survey of Wales programme. Further survey effort for this habitat is required to update and revise the increasingly ageing combined Phase 2 dataset and to characterise priority un-surveyed sites: survey of upland calcareous flushes remains a critical gap given the significant gaps in upland NVC survey coverage. Together these sources provide records for 120 hectads in Wales and a reasonable impression of the distribution of this habitat, but for the reasons identified here the overall dataset is not regarded as comprehensive. The 2012 data and the additions used for this reporting round (2018) are contained in Jones (2018a).
3.2: Sources of information	Only minor updates provided in 2025

4.3: Short-term trend; Direction	Judgement of decreasing reflects almost certain loss of site on Llyn at SH 211331 and suspect loss of other sites at edge of range on Penllyn.
4.11: Change and reason for change in surface area of range	Judgement of decreasing reflects almost certain loss of site on Llyn at SH 211331 and suspect loss of other sites at edge of range on Penllyn.
5.2: Surface area	The extent estimate for H7230 is based on the GIS inventory developed by Stevens (2012a) and described under section 4 above. The original estimate of 120.54 ha has been revised to 138.7 ha by adding records totalling 18.23 ha from the Lowland Grassland and Lowland Peatland Surveys – see section 2 above and Jones (2018a). The current figure is close to the 140 ha estimate for basic flush across Wales resulting from the Habitat Survey of Wales (Blackstock et al., 2010). Inevitable uncertainty surrounds the extent estimate of 1.387 km2. Firstly, this figure excludes a number of known locations for H7230 which remain un-surveyed by the Lowland Peatland Survey – these include a number of sites for M13 within the Anglesey heartland of this element of the habitat in Wales. Second, much of the data on which this estimate is based derives from survey undertaken some time ago: 99.1% of the extent data for H7230 arise from surveys undertaken prior to the last reporting round (date range 1984-2011), with 51.5% (71.54 ha) arising from surveys undertaken in excess of 20 years ago (date range 1984-1997) and 89.2% (123.7 ha) from survey data at least a decade old (date range 1984-2007). Loss of habitat or reductions in habitat area are known to have occurred at a number of surveyed sites and a much better system for systematically monitoring and documenting losses is urgently required. Finally, some data from Lowland Peatland Survey sites have yet to be added to the inventory. The core community composition of H7230 in Wales breaks down as follows: 5.6 ha of M9, 38.6 ha of M10, 30.6 ha of

	M13 and 2.4 ha of M14. The M13 resource is of particular concern and interest given the recent losses of this habitat and the ease with which it becomes degraded as a result of lack of or inappropriate management. A total of 716 polygons of this community have been recorded by the Lowland Grassland and Lowland Peatland Surveys of Wales (excluding Cors Geirch) across a total of 31 sites. The vast majority of the M13 resource (30.3 ha) is centered on Anglesey and Llŷn. The national (UK) significance of the Anglesey and Llŷn resource is highlighted by comparison with the estimated total area of M13 in England (Diack, 2016) which ranges from 20 ha of habitat 'unambiguously referable to M13" to a total calculated polygon area of 31.9 ha and another 7 ha of vegetation with affinities to M13. Updated assessment of the distribution, extent and condition of this Red List Annex 1 habitat is urgently required.
5.7: Short-term trend; Magnitude	This assessment is based on the known almost complete loss of this habitat from two Anglesey sites since 2007 (LGSW sites SH48/2 Graigfryn and SH48/4 Brynteg Meadows), coupled with loss of habitat due to dereliction. It is entirely possible that the actual rate of decrease could now exceed >1%.
5.14: Change and reason for change in surface area	Modest expansion of this habitat has occurred in response to the Anglesey & Lleyn Fens LIFE project actions. However, definite loss of habitat (M13) has occurred on at least one Anglesey site since the last reporting period (Ratcliffe, 2017) – this is due to agricultural improvement. Loss at other non-statutory sites is suspected but cannot be quantified due to lack of survey evidence. Contraction of area due to loss of condition and succession to other habitats is likely to be happening.
6.1: Condition of habitat	These figures are based on the 2018 reporting round, with no comprehensive data available on which to base a revised figure. The derivation of these figures is therefore based on Jones (2018b). This assumes that for any SAC

	site where this feature is judged as unfavourable (see 6.2 below) then the whole feature area is unfavourable on that site. The total extent of the H7230 resource within the SAC series is estimated as 55.2 ha in this reporting round (Milner, 2018) – this figure has been derived using a GIS overlay of SAC boundaries on the H7230 habitat inventory and is more accurate than the extent figures for H7230 given in the N2K data-sheets. For the Corsydd Mon SAC, an estimated 10% of the area of H7230 (3.3 ha out of a total of 33.4) has been assessed as in Favourable Condition following the application of the Anglesey & Llŷn LIFE project actions (Hanson, 2015), based on a combination of expert judgement and site visits (P.S. Jones) supported by the trends of improvement in condition noted by Birch et al. (2015). The remaining area of this habitat in the SAC series (55 ha) is regarded as being in Unfavourable Condition for the reasons given above. The difference between these figures and the total estimate extent of H7230 in Wales (138.7 ha) is 83.5 ha and has to be regarded as being in unknown condition due to lack of data.
6.4: Short-term trend of habitat area in good condition; Direction	This is based on observational evidence that the condition of H7230 across the Anglesey and Llyn Fen sites is deteriorating in the post LIFE project era.
6.6: Typical species	In the case of M13 on Corsydd Mon, there does appear to be an increasing incidence of algal colonies on Schoenus tussocks, sometimes associated with patches of the non-native bryophyte Campylopus introflexus, though this is not especially noted as a nitrophile.
7.1: Characterisation of pressures	Overview Analysis of Pressures has utilised NRWs Safle Database (NRW, 2024) based on a search of records for H7230 on sites. To this was added other records for the Flush & Spring SSSI features on sites known to support H7230 outside SAC contexts – this only added 3 sites. This database provides information on 'issues' affecting

habitats and species within the protected sites series in Wales and contains a total of 1543 management issue entries against the 'alkaline fen' feature description, of which 140 are categorised as 'withdrawn' or 'complete', leaving 1403 regarded as still applying. These apply across a total of 113 management units (many units have more than one management issue recorded) on 20 separate sites, including 7 SACs supporting this feature.

References to individual management issues against the pressures and threats considered below may be expressed as a percentage (in brackets) of the 113 total management units figure.

Restricting the search term to 'alkaline fen' means that data primarily just for SAC SSSI are reported here – this amounts to 55.2 ha or only 39.8% of the Welsh resource of H7230 based on 2018 data. These data are thus not wholly representative of the wider resource as it is to be expected that historic focussing of conservation measures would have led to better mitigation of pressures and threats inside the SAC series. However, use of the more general 'Flush and spring -soligenous mire' and 'Fen -topogenous mires in valleys, basins and flood plains' search terms would lead to many more records and apply to fen habitats other than H7230.

Pressures:

PA05: Abandonment of management/use of grasslands and other agricultural and agroforestry systems (e.g. cessation of grazing, mowing or traditional farming)

This is closely linked to PA08 , with insufficient cutting/ mowing acknowledged as an issue on 40 units across 11 SSSI, most of which lie within the Anglesey Fens or Llyn Fens SAC (NRW Safle Database, January 2025). Cutting/mowing (sometimes in conjunction with controlled burns) are often a necessary prerequisite for achieving

sustainable grazing of this habitat and the lack of priority and resources afforded to this in the era following the Anglesey & Llyn Fens LIFE project is of concern. Lack of controlled conservation burning management is also covered under this heading and the need for it does not appear to have been recognised consistently in the Safle database, with its requirement only needed for 4 management units.

PA08 Extensive grazing or undergrazing by livestock

Management neglect remains a key factor for this habitat, resulting typically in over-dominance of graminoids to the detriment of low-growing short-sedges, dicots and bryophytes: this also has an important impact on a wide range of specialist and often rare invertebrate species, particularly those which require some exposed wet substrate. This pressure was a major factor on the Anglesey & Llyn Fens SAC sites at the start of the LIFE project (Hanson, 2015) and the project demonstrated the restoration of derelict H7230 using combinations of mowing and then grazing. However, achieving appropriate grazing regimes can be difficult, particularly on sites under third party management/ownership where nature conservation is not the primary driver, but also on areas under NRWs management where resources constrain the extent of after-LIFE actions on the Anglesey & Llyn sites; consequently, this pressure has remained a key factor throughout the 2013-18 reporting period.

Insufficient grazing is cited as an issue on 19 units across 13 SSSI (NRW, Safle Database). Grazing type or timing affects 78 units on 14 SSSI: these two issues overlap (i.e. some SSSI units have both issues citedThis is not considered to represent the true scale of this pressure – for example under-grazing of H7230 on non statutory sites is also known to be a very significant issues.

Scrub invasion – chiefly by willow Salix sp. but also

including birch Betula sp. and hawthorn Crataegus monogyna – is recorded as an issue across 38 management units on 12 SSSI in NRWs Safle Database. This shows little change to its recorded incidence across 33 units on 10 SSSI during the previous reporting round (it was considered under the L02 Natural succession resulting in species composition change pressure heading at that time). Scrub encroachment is likely to also reflect the influence of PA05, PK03.

PA17 Agricultural activities generating diffuse pollution to surface or ground waters

Inorganic nitrogen concentrations in groundwater still exceed the site-specific threshold for N in groundwater for at least parts of the H7230 resource (Farr et al., 2018), with agriculture the most likely immediate source (SWS, 2010; Farr et al, in prep.). This is reflected by the currently 'poor' overall status of both the Ynys Mon Central Carboniferous Limestone (WFD Water Body Identification Number GB41001G204200) and Llyn & Eryri (GB41002G204600) groundwater bodies, in both cases due to chemical (enrichment) pressures (Water Watch Wales). Water pollution from diffuse sources is cited as an issue for 78 units across 11 SSSI (NRW Safle Database). Fertiliser use (on adjoining land as opposed to directly to the feature) is recorded as an issue affecting 50 units across 8 SSSI, all of them SAC. This is almost certainly an under-estimate of the significance of the issue given that improved grassland (generally intensively managed) is the majority catchment land-cover on most sites.

PA21 Active abstraction of water for agriculture

This is known to affect at least one unit on a SAC site (the Penrhyn abstraction at Cors Bodeilio, an NNR within the Corsydd Mon SAC, affecting unit

948) where a groundwater discharge feature is actively

pumped for stock watering; the highest demand for pumping is likely to coincide with summer-time low water levels, making this an additional concern. Other groundwater or stream abstractions are likely to be occurring within the catchments of the Corsydd Mon and Corsydd Llyn sites and these need to be identified and assessed.

PA22 Drainage for use as agricultural land

This is recorded as an issue on 78 units affecting 13 sites, mostly within SAC. This is judged likely to represent an over-estimate of the extent of the issue given the work undertaken by the Anglesey & Llyn Fens LIFE project. However, over a decade on since the completion of that project an expert review of the extent and impact of this issue is now urgently required, with a focus on addressing drainage which threatens to interrupt critical groundwater supply pathways. The related issue of 'Water levels (inc barriers to natural hydrology and altered water flow)" has been cited for 53 units on 9 SSSI. Other related issues include 'ditch management" and 'modified water courses" which shows significant overlap with the issues already considered above.

PL05: Modification of hydrological flow (mixed or unknown drivers)

Historical modifications to (and in some cases the introduction of) arterial drainage and other main drainage systems affects many of the classic sites for this habitat across the Anglesey & Llyn SAC areas and was a necessary prelude to both PA22 and historic peat cutting. This pressure still impacts a number of key SSSI, notably Cors Geirch and Cors Hirdre (Corsydd Llyn SAC), Cors Bodeilio, Cors Edrreiniog, Cors Goch and Cors y Farl (Corsydd Mon SAC). Restoration needs to be led by a thorough appreciation of the ecohydrology of the sites, all of which are valley-head as opposed to floodplain systems

in their basic function.

PK04: Atmospheric N-deposition

Air pollution is cited as a current issue for 18 units across 13 SSSI – this is an increase on the 2018 figures, suggesting greater awareness of the issue. There appears to be an increased instance of records for gelatinous algae on Schoenus tussocks in the M13 stands of the habitat on Anglesey.

PM07: Natural processes without direct or indirect influence from human activities or climate change.

This pressure is closely linked to PA05 and PA08 (and in many respects can be considered a consequence of these pressures and their interaction with PK03 & PK04) and manifests mainly as the overdominance of key herbaceous species, Overdominance by non-woody species is widespread, with dense growths of Molinia caerulea and Juncus sp. the cited reason for the feature being unfavourable at Gweunydd Blaencleddau (Wilkinson, 2017b) and this is a widespread issue affecting many sites. Lack of grazing typically leads to the development of very dense growths of Schoenus nigricans in M13 examples of H7230, and this remains a significant issue on the non NNR sections of the Anglesey & Lleyn Fens SAC, despite the advances achieved during the LIFE project (Hanson, 2015). Overdominance by these non-woody taxa is probably the most common reason for failing condition in H7230 across Wales.

PAO1 Conversion into agricultural land (excluding drainage and burning)

Attempts to increase the agricultural productivity of sites supporting H7230 resulted in three cases being subject to enforcement measures during the previous reporting period and under the Welsh Governments Environmental Impact

Assessment (Agriculture) (Wales) Regulations 2017 (Welsh Government, 2017). All three sites were on Anglesey and all three affected M13. Ongoing impacts are believed to remain at 2 of the 3 sites (January 2025). The other manifestation of this pressure concerns the ongoing consequences of the historic loss and truncation of examples of this habitat occurring at the edges of protected sites. Such stands now lack any natural upslope transition to other habitat types and are likely to be steadily declining in extent and quality due to boundary issues relating to drainage and nutrient enrichment. No quantitative data on this issue are available.

PI02: Other invasive alien species (other than species of Union concern)

NRWs Safle database records that non-native species are identified as an issue or risk for 81 units on 16 SSSI supporting this feature within 4 SAC, with Impatiens glandulifera a common taxon of concern. In most cases this pressure affects the sites supporting H7230 rather than stands of the habitat itself, although this risk is clearly present locally. This is a new pressure for the reporting period ending in 2025 and is limited to SAC only. It seems very likely that Epilobium brunnescens may be an issue for upland stands of M10. Safle contains no further INNS issues/risks records for non SAC SSSI supporting H7230.

PC12: Abstraction of surface and ground water for resource extraction

This was previously considered under PCO1. Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) in the 2018 reporting round. The Safle database records 'water abstraction” in relation to quarrying activity as an issue for 11 units on one SAC (Cwm Cadlan). This pressure is likely to apply at least another SAC (Corsydd Mon), potentially affecting two sites.

PJ03: Changes in precipitation regimes due to climate change

This is reported for a few management units in NRWs Safle database, but the lack of reports for some sites judged likely to be sensitive to this pressure suggests this pressure has not been assessed consistently. Predicted reductions in precipitation (summer rainfall is expected to decrease by approximately 15% by the 2050s and by between 18% to 26% by the 2080s; Welsh Government, 2024a) are likely to result in stands of H7230 experiencing two main adverse hydrological pressures; (i) deeper and more protracted drawdown of water tables beyond the range regarded as desirable for this habitat, and (ii) 'shutting' off of groundwater discharge features earlier in the summer season. Some stands of H7230 supporting Schoenus (M13) mire on Anglesey experienced significant water table drawdown in 2023 and assessment of key sites is needed to identify measures which might be used to ameliorate as much as possible the likely effects of future seasonal drought: these are likely to include (i) addressing drainage up and downslope of key sites, (ii) extending the areal influence of groundwater discharge and preventing its early interception and loss in arterial drainage systems, and (iii) seeking opportunities to promote landuse within catchments which promote water interception and storage within the groundwater source zone of key stands. There also needs to be an investment in long-term hydrological monitoring of key H7230 sites to gain a better understanding of the sensitivity of hydrological regimes to drought. The ecological impacts of drought are all adverse in the context of H7230 and are expected to include (i) impacts on marl formation, (ii) changing physical conditions for soft-sediment specialist species, (iii) contraction of vertical zones of species on biogenic tussocks, (iv) the development of conditions favoured by more generalist 'dry-land' taxa, (v) nutrient mineralisation and (vi) increased biomass and litter.

	PD05 Development and operation of energy production plants (including infrastructure) The possible future development of the Wylfa B Nuclear Power Generating Station on Anglesey (if progressed) poses a future threat to one non SAC SSSI site supporting H7230 – Tre'r Gof SSSI. The threat is posed by hydrological and hydrochemical pressures posed by bedrock and superficial aquifer removal and dewatering and by dumping of over-burden adjacent to the site. The impact could involve degradation or loss of M13 H7230. The development company has identified compensation sites in an attempt to mitigate this loss, through creation/re-creation of M13 habitat, however. At the current time (February 2025) the original site developer has withdrawn its Development Consent Order application but the UK Government has indicated it will continue to explore future opportunities for developing the site.
8.5: List of main conservation measures	The majority of measures are not fully implemented. A total of 55.3 ha of this habitat is included within this SAC series (this figure is based on overlap of the GIS habitat layer on the SAC series and not the N2K data-forms areas), with a total notified area of 75 ha (Milner, 2018). All these figures are based on 2018 reporting data and have not been revised, but there has been little designation activity since 2018. MA04 Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures. This concerns the need to address insufficient or inappropriate grazing and the lack of cutting and in some cases burning on sites supporting H7230. This overlaps with MM01 because commercial agricultural graziers are needed to effectively manage land supporting H7230 which is owned by NRW and eNGOs. The Anglesey & Llyn Fens LIFE project (Hanson, 2015) has successfully demonstrated the measures which need to be taken to

restore derelict H7230. However, lack of staffing resources has limited the extent to which this effective management has been continued since the end of the LIFE project in 2014, and critical locations for H7230 within the Corsydd Mon and Llyn SACs are now effectively un-managed, including the Cors y Farl and Cors Bodeilio Common sections of the Corsydd Mon SAC and parts of Cors Goch within the same SAC. Further resources are needed to address this.

MM01: Management of habitats (others than agriculture and forest) to slow, stop or reverse natural processes that occur without direct or indirect influence from human activities or climate change.

This is interpreted as pursuing essentially the same measures described above under MA04 but on land under NRW and eNGO partners direct management as NNRs. In the absence of a formal after-LIFE programme since completion of the Anglesey & Llyn Fens LIFE project, this measure is under-resourced and under-utilised and needs to be extended through additional resources to cover the whole of the H7230 resource under direct conservation ownership/management.

MA10 Reduce diffuse pollution to surface or ground waters from agricultural activities & MK01 Reduce impact of mixed source pollution.

This is the major measure required to reduce nutrient income to the sites supporting H7230 from both runoff and groundwater discharge – it applies mainly to Corsydd Mon and Corsydd Llyn. Evidence to date suggests that agri-environment measures have been ineffective in this regard, with both limited uptake to schemes and then limited application of measures within the scheme which might be used to reduce nutrient ingress. The Anglesey & Llyn Fens LIFE project attempted to begin addressing this issue through farm nutrient testing and also the use of

constructed wetlands on the edges of sites to intercept and remove nutrients; however (i) this only deals with point-source inputs on a handful of sites and (ii) the lack of any comparative inflow/outflow chemical monitoring means the continuing effectiveness of this measure is unclear. A NHLF project (Corsydd Calon Mon) led by North Wales Wildlife Trust with support from NNR is currently in the development phase and if fully funded will enable a concerted focus on achieving nutrient reduction measures within the site catchments. However, an NRW led after LIFE phase of work will also be needed to realise changes in land management practices of the scale required to ensure these oligotrophic fens can be managed sustainably. The combined catchment area of the Corsydd Llyn and Corsydd Mon fen sites is only 736 ha (Jones & Hanson, in prep.), so appropriate focussing of effort should be achievable.

Modelling by Farr et al (2019) suggests that measures to address diffuse terrestrial pollution would not alone yield reductions in terrestrial nitrate significant enough to meet the proposed groundwater 'threshold' values for nitrate.

MK03: Restore habitats impacted by multi-purpose hydrological changes and

MA13: Manage agricultural drainage and water abstraction (incl. the restoration of drained or hydrologically altered habitats)

Significant progress was been made for these measures under the Anglesey & Llyn Fens LIFE project, but further intervention is required across both these SACs to address a wide range of hydrological impacts posed by agricultural drainage and the management of water courses and hydrological inputs.

MJ02: Implement climate change adaptation measures

This is a newly identified measures for 2025. An assessment is urgently required of measures which could be implemented now and in the near future to increase the hydrological resilience of sites to increased incidences of drought. An important component of this would be measures to both maximise natural groundwater discharge onto sites supporting H7230 and then measures to maximise the retention of this on peatland surfaces affected by artificial drainage.

MI01: Early detection and rapid eradication of invasive alien species of Union concern (new for 2025)

This is a newly identified measures for 2025. Since the last reporting round Himalyan Balsalm Impatiens glandulifera is showing potential to invade fen surfaces and could become a future issues for stands of H7230. Monitoring and early eradication are thus key measures.

MA01 Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land.

Damage and habitat loss of H7230 occurred on at least three non-statutory sites on Anglesey alone during the last reporting period – in all cases due to agricultural intensification. No further instances are known. Dialogue needs to be established with the owners/managers of all non-statutory sites for this habitat (and particularly all examples supporting M13) and incentives for securing positive management put in place.

MC01 Adapt/manage extraction of non-energy resources

Quarrying activity poses a potential threat to this habitat within each of the Corsydd Mon and Cwm Cadlan SACs. The primary requirement for action here is to ensure monitoring of the effects of quarrying on groundwater levels is capable of detecting early changes which might be reversible through changes to quarrying practice.

MC09 Manage/reduce/eliminate air pollution from resource exploitation and energy production, & MA11 Reduce/ eliminate air pollution from agricultural activities.

National regulations are in place but have been insufficient to prevent continued high levels of N deposition nationally (MC09) and locally increasing ammonia pollution from expansion of poultry and cattle units (MA11).

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 enabling future habitat-sensitive thresholds.

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. A focussed and resource site nitrogen action plan is urgently required for the two core SACs for this habitat (Corsydd Mon and Corsydd Llyn).
9.1:Future trends and prospects of parameters	Range: The future trend in range is unknown, given the influence of climate change. Area: This assessment is based on two elements; the probable ongoing loss or contraction of stands of H7230 on non-statutory sites due mainly to pressure A01, and the contraction of stands due to successional change in under-managed/derelict examples. This trend will not be fully offset by expansion in the area of this habitat at Cae Gwyn (Cors Erddreiniog) which has been achieved as a result of the Anglesey & Llyn Fens LIFE project (see Jones et al., 2015). Increases in area due to new survey information are not considered here. Structure & function: This reflects the currently poor or unknown condition of the majority of the resource (see section 6) coupled with the relatively modest inclusion of this habitat in agri-environment and NRW management agreements. Glastir Advanced agreements between 2012 and 2023 only coverered 45 ha of this habitat, with this figure relating to agreement areas and not specific activities and also the 2012 extent data. NRW management agreements extend to just 3.3 ha based on 2012 extent data. This assessment also reflects the nature of the threats described under section 7 and the significant area of this habitat which lies outside the SSSI series; during the 2012

	assessment the area of this habitat within SSSI including 'flush & spring – soligenous mire' as a feature was just 59.1 ha (<50% of the resource) and there has been minimal notification activity since then. 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 decreasing by 1% per year or less; 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 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 decreasing.
10.4: Future prospects	Conclusion on Future prospects reached because: (i) the Future prospects for Range are unknown; (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.
11.1: Surface area of the habitat type inside the pSCIs, SCIs and SACs network	The estimate used for the 2012 reporting round was 0.53 km2. The difference is probably due to the inclusion of additional H7230 polygons resulting from survey since 2012: some of the difference may also result from the use of a different GIS platform (ARC as opposed to Mapinfo in 2012).

11.4: Short-term trend of habitat area within the network; Direction	In 2018 this was assessed as Increasing but is now assessed as Decreasing. This is because lack of resources are preventing any recovery back to this habitat from modified successors, though there is potential for this. There is some observational evidence to indicate losses within the series; poor condition stands are widespread, though they often remain classifiable as H7230 and ultimately recoverable to better condition to H7230.
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.
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.