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

2019-2024

Conservation status assessment for the habitat:

H4030 - European dry heaths

Wales

Cyfoeth Naturiol Cymru
Natural Resources Wales

JNCC

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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: European dry heaths

Distribution Map

Range Map

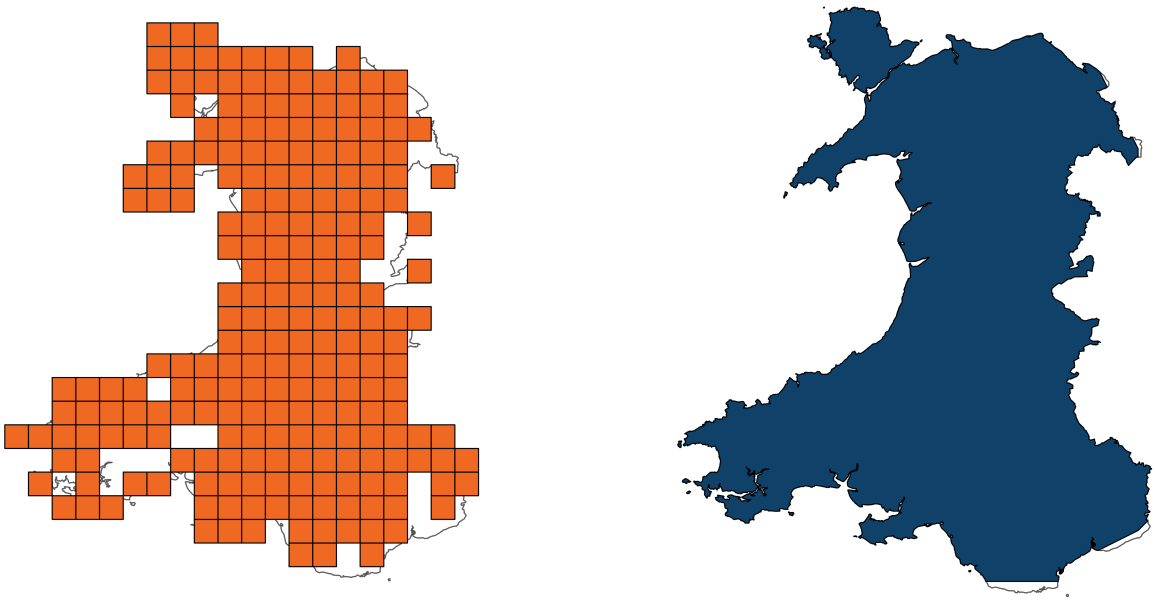

Figure 1: Wales distribution and range map for H4030 - European dry heaths. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available habitat records within the current reporting period.

Table 1: Table summarising the conservation status for H4030 - European dry heaths. 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)	**Unknown (XX)**
Structure and functions (see section 6)	**Unfavourable-inadequate (U1)**
Future prospects (see section 9)	**Unfavourable-bad (U2)**

List of Sections

National Level

1. General information

1.1 Country	Wales
1.2 Habitat code	H4030 - European dry heaths

2. Maps

2.1 Year or period	1987-2017
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)	20,668.18
4.2 Short-term trend; Period	2017-2024
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	Based mainly on extrapolation from a limited amount of data
4.6 Long-term trend; Period	
4.7 Long-term trend; Direction	Stable
4.8 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Rate of decrease	
4.9 Long-term trend; Method used	Based mainly on extrapolation from a limited amount of 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	No
b) Genuine change	
c) Improved knowledge or more accurate data	

d) Different method	
e) No information	
f) Other reason	
g) Main reason	

4.12 Additional information

No additional information

5. Area covered by habitat

5.1 Year or period	1987-2017
5.2 Surface area (km²)	
a) Minimum	
b) Maximum	
c) Best single value	777.4
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	
5.6 Short-term trend; Direction	Unknown
5.7 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
5.8 Short-term trend; Method used	Insufficient or no data available
5.9 Long-term trend; Period	1987-2024

5.10 Long-term trend; Direction	Decreasing
5.11 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Confidence interval	
d) Rate of decrease	
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 less than 2% 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	23.7
aii) Maximum	23.7
Area not in good condition	
bi) Minimum	191.5
bii) Maximum	191.5
Area where condition is unknown	
ci) Minimum	562.2
cii) Maximum	562.2
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	
6.4 Short-term trend of habitat area in good condition; Direction	Unknown
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
PA08: Extensive grazing or undergrazing by livestock	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	High (H)
PK03: Mixed source air pollution, air-borne pollutants	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	High (H)
PA09: Burning for agriculture	Ongoing and likely to be in the future	High (H)
PA06: Mowing or cutting of grasslands	Ongoing and likely to be in the future	Medium (M)
PJ10: Change of habitat location, size, and / or quality due to climate change	Ongoing and likely to be in the future	Medium (M)
PI03: Problematic native species	Ongoing and likely to be in the future	Medium (M)
PF05: Sports, tourism and leisure activities	Ongoing and likely to be in the future	Medium (M)
PM07: Natural processes without direct or indirect influence from human activities or climate change	Only in future	Medium (M)

PJ03: Changes in precipitation regimes due to climate change	Ongoing and likely to be in the future	Medium (M)
PB01: Conversion to forest from other land uses, or afforestation (excluding drainage)	Only in future	Medium (M)
PK04: Atmospheric N-deposition	Ongoing and likely to be in the future	High (H)

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	Maintain the current range, surface area or structure and functions of the habitat type
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
MA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	High (H)

MA05: Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	High (H)
MA07: Restoration of Annex I agricultural habitats (incl. re-establish and improve)	High (H)
MA11: Reduce/eliminate air pollution from agricultural activities	Medium (M)
MB01: Prevent conversion of (semi-) natural habitats into forests and of (semi-) natural forests into intensive forest plantation	Medium (M)
ME03: Manage/reduce/eliminate air pollution from transport	Medium (M)
MF03: Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	Medium (M)
MI04: Restoration of habitats affected by invasive alien species (incl. of Union concern and others)	High (H)
MI05: Management of problematic native species	High (H)
MJ02: Implement climate change adaptation measures	Medium (M)

8.6 Additional information

No additional information

9. Future prospects

9.1a Future trends of parameters

ai) Range	Overall stable
bi) Area	Unknown
ci) Structure and functions	Very negative - important deterioration

9.1b Future prospects of parameters

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

9.2 Additional information

No additional information

10. Conclusions

10.1 Range	Favourable (FV)
10.2 Area	Unknown (XX)
10.3 Specific structure and functions (incl. typical species)	Unfavourable-inadequate (U1)
10.4 Future prospects	Unfavourable-bad (U2)
10.5 Overall assessment of Conservation Status	Unfavourable-bad (U2)
10.6 Overall trend in Conservation Status	Unknown

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 (km^2)

a) Minimum	
b) Maximum	
c) Best single value	215.16
11.2 Type of estimate	Best estimate
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	Stable
11.5 Short-term trend of habitat area within the network; Method used	Complete survey or a statistically robust estimate
11.6 Short-term trend of habitat area in good condition within the network; Direction	Uncertain
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

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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 (and extent) of H4030 has been calculated using three main data sources plus additional surveys and research reports. A polygon-based GIS inventory was produced in 2012 (Stevens and Sherry 2012) and reviewed in 2018. There is likely to be additional data which could be added to the map based on a review of NVC data but currently this has not been processed and therefore no changes have been made to the map. Data source 1 (MAIN DATA SOURCE): 'Phase 1' Habitat Survey of Wales (HSW; Blackstock et al. 2010). This was a comprehensive field-by-field survey of the region; distribution data for this habitat come entirely from the upland component of the survey, conducted between 1979 and 1989. This is a relatively old dataset and has not been updated with more recent changes in habitat extent. Data source 2 (MAIN DATA SOURCE): Lowland Heathland Survey of Wales (LHSW various authors summarised in Sherry 2007). This was a targeted NVC (Rodwell (ed.) 1992) survey focussing on heathlands of high conservation interest in the Welsh lowlands. Survey work was conducted between 1993 and 2002. Data source 3: (MAIN DATA SOURCE): Heathland data collected as part of the Lowland Grassland Survey of Wales (LGSW; Stevens et al. 2010). Survey work was conducted between 1987 and 2004. Data source 4: Various upland NVC Surveys (various authors) undertaken between 1996 and 2023. Data source 5: A sample survey of 48 1km squares in the

	Snowdonia National Park between 2009 and 2011 (Gritten 2012). Data source 6: Heathland records from 2 studies of coal spoil vegetation in south Wales in 2007.
4.3: Short-term trend; Direction	Significant changes to the 10km square distribution and linked range of H4030 in Wales since the last reporting round are unlikely to have occurred. The habitat has been recorded from the majority of hectads and in most it occurs in multiple locations. As a result there is limited scope for increases in range and decreases would typically require the total loss of habitat from multiple localities .
4.11: Change and reason for change in surface area of range	The distribution data submitted in 2013 has not been updated.
5.4: Surface area; Method used	See 2.3
5.6: Short-term trend; Direction	Both losses and gains are known to be occurring (individual site records, satellite data and anecdotal evidence). The ERAMMP Report (Emmett et al 2024) shows a 3% increase in dwarf-shrub heath since 2010 using satellite imagery however it is possible that this is within the estimation error of the approach for the methodology. In addition the dataset does not distinguish between the H4030 European Dry Heath and the H4010 Northern Atlantic Wet Heath with Erica tetralix. However, NRW has no system in place for monitoring or recording such changes and losses of heath, for example to agricultural improvement, habitat succession or development, or gains notably through positive conservation management or as a result of relaxation of grazing pressure are not uncommon at individual locations. The short-term trend in area is therefore considered to be unknown.
5.8: Short-term trend; Method used	Changes in the extent of H4030 have been recorded at a number of individual sites: In Ceredigion, a small area of

dry heath has been lost to coastal and neutral grassland (Sherry 2016); SAC monitoring at Cernydd Carmel showed a 2.03 ha loss of habitat equating to 11% of the European Dry Heath feature on the site (Wilkinson 2016); SSSI monitoring at Mynydd Ty-Isaf, Rhondda(SSSI) has shown an increase in dry heath (NRW 2018). SSSI monitoring at Parc Bodlondeb (NRW 2024) has shown a 53% decrease in calcareous dry heath, from 1.55 ha to 0.73 ha as a result of scrub encroachment.

In the lowlands losses are primarily due to lack of grazing and abandonment leading to successional change (scrub and woodland development) with smaller losses to grassland. In the uplands, grazing still supresses heathland regeneration across large areas but losses are also attributable to bracken encroachment and woodland encroachment. The NRW survey of wood pasture (Sherry 2023 and Sherry and Douglas 2023) found native woodland and conifers encroaching on to moorland habitats including dry heath due to a lack of grazing.

Gains are primarily from decreased grazing in the uplands. Photomonitoring on the Eryri SAC at Cwm yr Afon Goch and Cwm Anafon (Harrison 2023) has shown a gradual increase in the cover of dry heath on steep ground between 2010 and 2022. However, no quantitative data available. Monitoring at Cwm Idwal in the Eryri SAC (Turner 2022) has shown an overall increase in dry heath between 2016-2017 and 2017-2022.

Small-scale habitat re-creation schemes have been undertaken in the lowlands the largest being at Trehill Farm in. Pembrokeshire where 30 ha European dry Heath have been created (Hayes and Spiridonova 2009). In addition some areas of heathland have been restored following conifer removal for example Penlan Forest in Pembrokeshire (PCNP) and Hensol Forest, vale of Glamorgan (NRW).

	The area of habitat lost and gained is not sufficiently well recorded or monitored to make a judgement on the overall short term trend. Successional changes are particularly poorly recorded. The ERAMMP satellite data (see above) may represent a real change in habitat extent as it shows an expansion of dwarf-shrub vegetation, however it is difficult to determine whether this is an actual change in the Annex 1 habitat and requires more ground truthing.
5.12: Long-term trend; Method used	The ERAMMP satellite data (see above) may represent a real change in habitat extent since 2010 as it shows an expansion of dwarf-shrub vegetation, however it is difficult to determine whether this is an actual change in the Annex 1 habitat and requires more ground truthing. There is no evidence to suggest that losses reported in 2012 have been re-gained (JNCC Archive 2017, Gritten 2012). Losses still continue as a result of both abandonment and intensification, although these are unlikely to be as large-scale as those recorded pre-2012 reporting round. A number of long-term, but relatively small-scale projects have restored or re-created heath from forestry or agricultural land in the lowlands. Reduced grazing in the uplands has favoured heathland expansion (Harrison 2023, Turner 2022). This has largely been as a result of Glastir, management agreements or stock exclusion at individual sites e.g. Cwm Idwal.
5.14: Change and reason for change in surface area	Whilst change may have occurred during the reporting period there is insufficient data to recalculate the surface area figure
6.2: Condition of habitat; Method used	Pre 2018 European Dry Heath condition had been assessed using Common Standards Monitoring on 21 sites, only one of which; Rhinog was recorded as favourable (NRW 2018). Post 2018 condition data has been collated from a very

	small selection of NRW SAC and SSSI monitoring reports; Eryri SAC (Harrison 2024), Bwdd Arthur (Rawlins and Harrison 2023), Parc Bodlondeb and Gwenallt Parc, Lixham (NRW 2024), and Craig Wen / Cors Castell SSSI (Rawlins 2023). European dry heath is assessed as unfavourable at all four sites. The NRW Protected sites baseline assessment 2020 provides an overview of feature condition. This was a desk-based review of site condition based on a range of datasets with variable confidence in the quality of the data and the condition assessments. The baseline assessment dashboard shows that H4030 is in favourable condition on 4 sites; Rhinog, Llynoedd Ieuan, Pumlumon (Plynlimon) and Craig-y-pistyll. However the quality of the evidence and confidence in the condition assessment is low for 3 sites and medium for 1. The NRW Protected sites baseline assessment lists 55% of SSSI dry heath and 62% of SAC dry heath features as unfavourable and 39% of SSSI and 24 % of SAC features as unknown. The extent of habitat in good condition (6.1) is based on the assumption that the condition of H4030 outside the designated sites is similar to that within the SACs/SSSIs.
6.3: Short-term trend of habitat area in good condition; Period	Repeated monitoring data are only available for Rhinog SAC for 2003 and 2011 – H4030 favourable in each monitoring round.
7.1: Characterisation of pressures	Pressures: 1. NRW SAFLE database 2024 The major issues recorded on the SAFLE database for H4030 are: • Inappropriate grazing is recorded as an issue on 19 sites (SACs) and 279 units. Over grazing (PA07) is an issues on 9 sites and under-grazing (PA08) on 13 sites with some sites having both under-grazed and overgrazed units.

Grazing type/or timing is an issues on 15 units and principally refers to the lack of cattle grazing. Stock feeding is an issue on 2 sites.

• Insufficient cutting (PA06) is an issue on 3 sites an 30 units. Insufficient management has resulted in scrub invasion and bracken invasion (P103) on 14 Sites and 140 units.

• Recreation and access (PF05) is recorded as an issue on 7 sites and 45 units are principally refers to path erosion

• Historic or current tree planting (PB01) and insufficient tree management is an issue on 7 sites and 86 units. This includes the invasion of conifers from adjacent forestry.

• Non-native species (P103) are an issue on 14 sites and 56 units. Typically this refers to rhododendron and self-seeding non-native conifers but other species such Himalayan balsam and Japanese knotweed are recorded.

• Fire (PA09) is listed as an issue on 9 sites and 69 units

2. The NRW Life N2K dataset shows that 69% of issue risks identified for European Dry Heath are of high priority and 54% are of high urgency. Of the high priority and high urgency risk 67% and 74% respectively relate to risks from agricultural and land management issues.

3. NRW SAC/SSSI monitoring data show that (PA08) insufficient grazing is a key reason for feature failure on lowland European Dry Heath on lowland sites (Harrison 20171, Harrison 20172, Wilkinson 2015, Wilkinson 2016, Rawlins and Harrison 2023 and NRW 2024,). Overgrazing (PA07) is recorded as a reason for failure on the Eryri SAC (Harrison 2024). Dry heath has been shown to recovering from overgrazing on Llanllechid Common in the Eryri SAC (Harrison 20242) although overall the site remains overgrazed in agricultural terms and grazing hotspots

persist.

4. The Survey and Strategy for Anglesey's Lowland Heathlands 2023 (Kehoe 2024) found that grazing was the critical factor in determining habitat condition with the majority of sites have ungrazed or undergrazed units.

5. The nitrogen critical load (NCL) for A4030 has been set at 5kg/ha/yr by JNCC. 100% of the habitat extent lies within an area where the NCL has been exceeded. The 2024 ERAMMP (Emmett 2024) data show an increase in acidity on dwarf-shrub heaths soil possibly as the result of nitrogen deposition and climate change.

6. The LIFE Natura 2000 Programme a data shows that inappropriate grazing and livestock management is an issue or risk on 78 out of 112 Natura 2000 sites across Wales (70%). The Thematic Action Plan Grazing and Livestock management recorded 354 instances of heathland features being impacted by grazing issues, more than on any other habitat. Monitoring data show that securing the correct grazing stock (actions database) and maintaining an appropriate grazing regime remain a significant issue.

7. The 2024 ERRAMP report (Emmett 2024) shows that there is no or low detectable effect of Glastir prescriptions on the condition of dwarf-shrub heath.

Threats:

1. NRW SAFLE database 2024

The major risks recorded on the SAFLE database for H4030 are:

• Grazing issues remain a risk on 10 Sites and 410 units

• Recreation and access (PF05) is recorded as a risk on 3

sites and 47 unit this principally refers to the potential proliferation of paths through the habitat.

• Insufficient cutting (PA06) is listed as a risk on 2 sites and 67 units.

• Scrub invasion and bracken invasion (P105) are identified as risks on 7 Sites and 97 units.

• Colonisation by non-native species (P103) is a risk identified on 8 sites and 173units.

• Fire (PA09) is listed as a potential risk on 12sites and 468 units

2. Changes to agricultural management and in particular grazing, as a result of policy or economic change, remains the greatest threat to European Dry Heath. Improving the effectiveness of agri-environment schemes for dwarf-shrub heath will depend on the correct approach being taken through the Sustainable Farming Scheme (Welsh Government 2024a) which is currently under development.

3. The vast majority of heathland is open access and pressures are likely to grow in response to various initiatives to meet Welsh Governments goal of improving the opportunities to access the outdoors for responsible recreation (Welsh Government 2015). Increasing public use on small lowland heathland sites has been shown to cause direct damage such as creation of new paths on desire lines, accidental and deliberate fire and the localised enrichment of vegetation by dog faeces and urine (Underhill 2005) (PF05).

4. There is a considerable amount of research literature on the long-term impacts of both nitrogen deposition (Southon et al. 2012, 2013) and climate change on heathlands (Fagúndez 2013). The response to these drivers of change can be slow and therefore remains a long-term threat,

	evidence has been collected on potential management measures to mitigate these impacts (Natural England 2013), (Barker et al. 2004) (PJ10, PJ03, J03). Climate change both periodic drought and increased rainfall can impact on the habitat drought, for example, can result in the loss of soil carbon and changes in the soil microbial community (Gliesch 2024). 5. The impacts of the pathogens Phytophthora ramorum, P. kernoviae (and to a lesser extent P. pseudosyringae) (LA06) on heathland have been well researched (Bishop and Jones 2011 and Conyers et al. 2011. In heathland infection of Vaccinium is the primary concern (JNCC 2010). P. Kernoviae and P. ramorum have been recorded on heath in Wales but their impact on heathland has been limited, however these pathogens remain a threat with extensive outbreaks relatively close by on Cannock Chase (Natural England 2014) and Stiperstones (Natural England 2015). Pathogens can be moved to on clothes, footwear, vehicles and pets (Defra 2014) and there is a potential threat from increased movement between recreational areas In England and Wales. 6. Plans to increase the extent of woodland in Wales may mean that afforestation represents an enhanced threat to existing areas of H4030 in Wales in the future and may restrict the opportunities for restoring the habitat in areas previously lost to forestry. 7. As the entire habitat resource lies within areas where the NCL is exceeded, nitrogen deposition will continue to be a threat to habitat structure and function. Nitrogen deposition may continue to be a factor in heathland soil acidification.
8.5: List of main conservation measures	1. NRW SAFLE database 2024. The database shows that since 2019 conservation measures have been completed on 9 sites and 71 units. These measures include direct action, negotiation of Management Agreements, issuing consents and investigations. (MA04, MA05, MA07, MI04, MI05, MB01, MF03). The majority of actions are listed as

identified, planned, not agreed or underway.

2. The future Welsh Government Sustainable Farming scheme will be critical for improving the condition of this habitat particularly in light of the low or no impact reported by Glastir monitoring (Emmett 2024).

3. Currently there are no landscape-scale projects underway in Wales which focus specifically on heathland habitats. Anglesey County Council has recently commissioned a resurvey and assessment of the Anglesey Heathland Strategy with costed heathland action plans for future funding opportunities (Kehoe 2024) Most active management of European dry heath is undertaken at a site level by NGO land owners e.g. RSPB , National Trust etc.

4. Measures should be in place to prevent afforestation of European Dry Heath through EIA Forestry Regulations (NRW), work is required to control non-native tree invasion outside forestry (MB01).

5. National regulations are in place but have been insufficient to prevent continued high levels of N deposition nationally and locally increasing ammonia pollution from expansion of poultry units (MA11, ME03).

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. 6. One large-scale heathland re-creation project on agricultural land has been in progress since 2004 (Hayes and Spiridonova 2009), other smaller projects are underway but not documented (MA07). 7. A decision-making framework has been developed to guide management response to Phytophthora outbreaks on heathland (Bunch et al. 2016) (MA06, MI04).
9.1:Future trends and prospects of parameters	Significant changes to the 10km square distribution and linked range of H4030 in Wales are considered unlikely over the next 12 years. The habitat is very widespread in Wales and there is limited scope for range expansion, conversely most hectads support multiple examples and making loss of all localities within a given square unlikely. Evidence suggests that currently there are both losses and gains in extent. Potentially there will be large gains in the uplands with reducing grazing as a result of changing agricultural policy and practice. However, it is currently not

possible to determine how the losses and gains balance each other.

Structure and function:

1. Only 41 % of the habitat resource lies within the protected site network. Implementation of management to address issues outside the SSSI series is not well documented but Gritten (2012) suggests that agricultural and land management issues will continue to result in the loss of structure and function outside the designated sites.

2. SAC Monitoring data (2018) show that of the 21 SACs with the European Dry Heath Feature, one is partially destroyed four are unfavourable declining or showing no change, two are unfavourable recovering, nine are unfavourable unclassified and only one is favourable maintained.

3. It is projected that the combined impacts of a number of pressures will intensify in future, for example wildfire on heathland is predicted to increase as a result of climate change and this could be exacerbated by nitrogen deposition and decreasing grazing and vegetation management (Southon 2012, 2013).

4. Management responses to these pressures need to be carefully planned with a clear understanding of how habitat resilience is influenced by the interaction of pressures and actions. For example under drought conditions heathland soils under young heather retain more soil carbon than droughted soils under old unmanaged heather thus suggesting maintaining traditional mowing practices may be important to mitigating the impacts of climate change (Gliesch et al 2024).

5. As the entire habitat resource lies within areas where the NCL is exceeded, nitrogen deposition will continue to be a

	threat to habitat structure and function. Nitrogen deposition may continue to be a factor in heathland soil acidification.
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 unknown; (ii) the current Area is approximately equal to the Favourable Reference Area; and iii) the change in distribution pattern is unknown.
10.3: Specific structure and functions	Conclusion on Structure and function reached because habitat condition data indicates that between c.5-25% of the habitat is in unfavourable (not good) condition.
10.4: Future prospects	Conclusion on Future prospects reached because: (i) the Future prospects for Range are good; (ii) the Future prospects for Area covered by habitat are unknown; 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 one of the conclusions is Unfavourable-bad.
11.3: Surface area of the habitat type inside the network; Method used	The area was calculated from the polygon data in 2012 and reviewed in 2018.
11.4: Short-term trend of habitat area within the network; Direction	European Dry Heath Feature on Rhinog SAC recorded as favourable maintained in 2003 and 2011.
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.