Llywodraeth Cymru
Welsh Government

Cyfoeth Naturiol Cymru
Natural Resources Wales

Habitats Regulations Summary Report for the reporting period 2019-2024

Wales

Regulation 9A of the Conservation of Habitats and Species Regulations 2017 (as amended)

Mae'r ddogfen hon hefyd ar gael yn Gymraeg

About Natural Resources Wales

Natural Resources Wales' purpose is to pursue sustainable management of natural resources. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Recommended citation for the report

Natural Resources Wales & Welsh Government (2026) Habitats Regulations Summary Report for the reporting period 2019-2024: Wales: Regulation 9A of the Conservation of Habitats and Species Regulations 2017 (as amended).

Ministerial foreword

I am pleased to introduce Wales's first country-level report which brings together – for the first time in a single publication – a comprehensive assessment of the condition, trends and management of the habitats, species and wild birds that are of importance in Wales.

This report marks an important milestone. It demonstrates our continued commitment to high environmental standards following the UK's departure from the European Union and reaffirms our ambition to maintain and enhance nature in line with the principles set out in the Environment (Wales) Act 2016 and the Well-being of Future Generations (Wales) Act 2015.

The findings of this report reinforce the evidence in the State of Natural Resources Report (SoNaRR) on the urgent need to address nature loss and ecosystem resilience to protect nature in Wales. Together, they will inform future policy development, guide investment, and support delivery of our commitments under the Global Biodiversity Framework – including protecting and effectively managing at least 30% of our land, freshwater and sea for nature by 2030.

The results presented here show both the progress Wales has made and the scale of the challenges that remain. Through significant investment – including through the Nature Networks Programme, Natur am Byth, the National Peatland Action Programme, and major LIFE-funded restoration initiatives – we are restoring some of Wales's most threatened habitats and species, improving the condition, connectivity, and resilience of Wales's protected sites as part of the UK-wide network. But there is much more to do.

This report sits alongside the Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill, which is crucial to our response to the nature emergency in Wales and driving more action. It will embed environmental principles in decision-making and establish statutory biodiversity targets for Wales. These targets will provide a clear, long-term framework for nature recovery and accountability, ensuring that the ambition reflected in this report is matched by action and measurable outcomes.

I would like to thank Natural Resources Wales, our partners across Wales, and the many organisations, volunteers and communities whose work underpins this report. Their continued commitment is essential to ensuring that Wales's natural environment can thrive for future generations to enjoy.

Huw Irranca-Davies MS

Deputy First Minister and Cabinet Secretary for Climate Change and Rural Affairs

January 2026

Contents

1. Executive summary

Introduction

The Habitats Regulations 9A report represents Wales's first country-level assessment under Regulation 9A of the Conservation of Habitats and Species Regulations 2017 (as amended in Wales). This report has been prepared by Natural Resources Wales on behalf of the Welsh Government. It integrates information on habitats, non-bird species and birds, providing a comprehensive account of their trends, pressures and conservation measures. Condition assessments are included for habitats and non-bird species only. The legislative framework remains rooted in the European Union Habitats and Birds Directives and has been retained in Welsh law following the UK's departure from the EU. This report marks a significant step, bringing together evidence previously reported separately under the Habitats Directive Article 17 (for habitats and non-bird species) and the Birds Directive Article 12 (for birds) into a single, integrated process.

The reporting period for this assessment is 2019–2024. The report publication aligns with other statutory environmental assessments such as the State of Natural Resources Report (SoNaRR) to provide a connected evidence base for Wales's terrestrial, freshwater, and marine environments. The scope includes terrestrial Wales, Welsh inshore waters and offshore areas ecologically connected to Wales, covering all Habitats Directive Annex I habitats, Annex II, IV, and V species, as well as all wild bird species present in Wales — including naturally occurring species, those listed under Annex I and Annex II of the Birds Directive, and regular migrants. While the offshore component is reported separately by JNCC, relevant information is incorporated here to provide context.

Methodology for assessing Favourable Conservation Status for habitats and non-bird species

Assessments of Favourable Conservation Status (FCS) follow the UK-wide approach detailed in the UK Approach Document hosted by JNCC, ensuring consistency across the UK. Distribution and range maps were compiled using the best available evidence, drawing on data from NRW monitoring programmes, partner agencies, NGOs, research institutions, and citizen science schemes. FCS is assessed for each Annex I habitat and Annex II, IV, and V species (excluding birds) using parameters such as range, area, structure and functions, and future prospects for habitats, and population, range, habitat, and future prospects for species. Each parameter is evaluated as either Favourable, Unfavourable-inadequate, Unfavourable-bad, or Unknown, in line with European Commission guidance. Favourable Reference Values (FRVs) are used as benchmarks for the minimum natural range, surface area or population size required for a habitat or species to be considered healthy and sustainable. For this reporting round, FRVs were reviewed and adapted to reflect Welsh circumstances where necessary, ensuring assessments were relevant to Wales.

Summary of Welsh habitat Favourable Conservation Status, pressures and conservation measures

Of the 61 habitats assessed in Wales, only two were found to be in Favourable condition, both with stable trends. Nine habitats were assessed as Unfavourable-inadequate, with a mix of improving, stable, deteriorating, or unknown trends. The majority—48 habitats—were in Unfavourable-bad condition, with most exhibiting stable, deteriorating, or unknown trends. Mixed source pollution was the most widespread high and medium-ranked pressure, affecting 55 habitats, and remained the most significant even when considering only high-ranked pressures. Agriculture-related practices were also a major pressure, impacting 52 habitats, particularly heaths, wetlands, grasslands, uplands and freshwater habitats. Climate change, urban and infrastructure development and alien and problematic species were also frequent pressures across habitat types. Conservation measures related to agriculture were the most widespread, with 53 habitats having such measures in place, followed by measures addressing mixed source pollution and human-induced changes in hydraulic conditions.

Summary of Welsh non-bird species Favourable Conservation Status, pressures and conservation measures

Among the 53 terrestrial non-bird species assessed, 14 were found to be in Favourable condition, with two showing improving trends and the remainder stable. Eighteen species were in Unfavourable-inadequate condition, with a mix of improving, stable, deteriorating, or unknown trends. Sixteen species were in Unfavourable-bad condition, with most exhibiting deteriorating trends. The status of five species could not be determined due to insufficient data.

Of the 12 non-vagrant marine species that occur in Welsh waters, four were found to be in Favourable condition with stable trends. Two species were assessed as Unfavourable–inadequate, one of which was stable and one had an undetermined trend. One species was in Unfavourable–bad condition and considered stable. The status of five marine species could not be determined due to insufficient data.

Agriculture-related practices were the most commonly reported pressure, affecting 44 species, followed by forestry and climate change. Urban and infrastructure development was a high-ranked pressure for 16 species. Fish species were notably impacted by water-related pressures, including changes in water regimes, energy production, and pollution. Conservation measures related to agriculture were the most commonly reported, followed by forestry and infrastructure measures.

Summary of bird species' conservation status, trends, pressures and conservation measures

This report provides the first Wales-specific assessment of the conservation status and population trends of bird species that regularly occur in Wales. It builds on the UK's eleventh Article 12 report and applies the UK approach of reporting on species populations rather than individual species. A total of 350 species populations were assessed, including breeding, passage, and wintering populations. The fifth UK Birds of Conservation Concern (BoCC) assessed 245 species and indicated a continuing

decline in UK bird populations. Between BoCC4 and BoCC5, 23 species moved to a higher level of concern, while only 11 improved in status. BoCC assessments show continued deterioration in breeding bird communities in farmland, woodland and upland habitats, as well as in breeding seabirds and non-breeding waterbirds. The IUCN GB Red List assessments support these findings. Of the 235 extant species assessed, 108 (46%) had at least one population at risk of extinction, including 21 Critically Endangered, 41 Endangered, and 46 Vulnerable. Notable changes include Spotted Crake *Porzana porzana* and four species of seabirds moving from Least Concern in GB IUCN 1 to Critically Endangered: Leach's Storm-petrel *Oceanodroma leucorhoa*, Northern Fulmar *Fulmarus glacialis*, Great Black-backed Gull *Larus marinus* and Atlantic Puffin *Fratercula arctica*. Breeding species relevant to Wales that moved to Endangered include Northern Wheatear *Oenanthe oenanthe*, Common Chaffinch *Fringilla coelebs*, and Twite *Linaria flavirostris*.

Pressures were assessed for all bird species with population estimates. Climate change was the most frequent pressure category, affecting 48% of species populations assessed, including 91% of Welsh breeding seabirds. Agricultural activities impacted 68 species populations, and alien and problematic species affected 46. Disease was identified as a pressure for 46 species populations, with 16 classed as high impact. Conservation measures were reported for 208 species populations, with infrastructure- and agriculture-related actions being the most numerous. Despite climate change being the highest-ranking pressure, only 12 species populations had associated mitigation measures.

Implementation report

All information on the implementation of Habitats Regulations 9A of the Conservation of Habitats and Species Regulations in Wales for the period 2019–2024 is provided in the full Implementation Report, which is included as a technical appendix to this summary report. The appendix presents the first country-level assessment of Regulation 9A in Wales, developed in the context of the UK's departure from the European Union. It offers a comprehensive overview of actions taken to give effect to the Habitats and Birds Directives across terrestrial, freshwater, and marine environments, with particular emphasis on the National Site Network of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The appendix includes its own executive summary and serves as the primary source of technical evidence and analysis, covering topics such as site management, habitat restoration, species recovery, research and monitoring systems, and the integration of protected sites with local economies and communities. Readers seeking detailed findings, methodologies, or supporting evidence should refer directly to the technical appendix for a full account.

2. Overview

Legislative and policy context

This report presents Wales's first country-level assessment under Regulation 9A of the Conservation of Habitats and Species Regulations 2017 (as amended in Wales) ("Habitats Regulations 9A"). Prepared by Natural Resources Wales (NRW) on behalf of the Welsh Government (WG), it brings together information on habitats, non-bird species, and birds of European importance into a single, integrated format — covering their condition, trends, pressures, and the measures in place to conserve them.

Regulation 9A requires periodic reporting on the implementation of the Habitats and Birds Directives (92/43/EEC and 2009/147/EC). These Directives — two of the most important legislative instruments for biodiversity conservation in Europe — aim to maintain or restore listed habitats and species across their natural range. The Habitats Directive focuses on achieving Favourable Conservation Status for Annex I habitats and Annex II, IV, and V species, while the Birds Directive seeks to ensure the protection and sustainable management of all wild bird species, including those listed in Annex I and regular migrants. Originally EU legislation, their provisions remain embedded in Welsh law following the UK's departure from the European Union, having been transposed into domestic legislation through the Habitats Regulations.

In previous reporting cycles, Wales's contribution formed part of UK-level reports coordinated by the Joint Nature Conservation Committee (JNCC) and submitted to the European Commission. This is the first time Wales has produced its own stand-alone Habitats Regulations 9A report, providing a more focused and accessible account of evidence, measures, and outcomes specific to Wales. It also marks the first time that information previously reported separately under Article 17 of the Habitats Directive (Annex I habitats and Annex II, IV, and V species, excluding birds) and Article 12 of the Birds Directive (all wild birds) has been brought together in a single combined reporting process.

Wider policy and reporting context

The Habitats Regulations 9A report is just one of Wales's statutory environmental reporting requirements. Under the Environment (Wales) Act 2016 NRW produces the State of Natural Resources Report (SoNaRR) which takes a broad ecosystem-scale approach. It assesses the state of biodiversity, the main trends and factors affecting, or likely to effect, the state of natural resources, it highlights evidence needs and gaps, and the extent to which Wales is achieving sustainable management of natural resources (SMNR). It also considered the contribution of natural resources to the well-being goals under the Well-being of Future Generations (Wales) Act 2015. The Water Framework Directive (WFD) adds an important statutory reporting strand for aquatic environments, evaluating the ecological and chemical status of rivers, lakes, estuaries, coastal waters, and groundwater. Together, these three reports provide a connected evidence base for Wales's terrestrial, freshwater, and marine environments.

Habitats Regulations 9A follows a cycle aligned to the former EU six-year timetable. Evidence from Habitats Regulations 9A report now directly feeds into the SoNaRR

assessment of biodiversity condition and trends, while SoNaRR provides the wider environmental and policy context for interpreting the feature-specific results of Habitats Regulations 9A.

This statutory reporting is complemented by broader Welsh policy and strategy. The Environment (Wales) Act 2016, the Well-being of Future Generations (Wales) Act 2015, and the Nature Recovery Action Plan (NRAP) for Wales set out strategic ambitions for biodiversity conservation. Together, these provide an integrated approach that links site-based protection with wider landscape- and seascape-scale action, helping to address biodiversity loss and support ecosystem resilience. For further details see section on Policy Drivers in Wales within the Implementation report technical appendices.

Scope and coverage

The assessments in this report cover terrestrial Wales, Welsh inshore waters, and, for marine habitats, relevant offshore waters that are ecologically connected to Wales. For completeness, these offshore components have been included in the Welsh assessments, while JNCC will also produce a separate UK-level assessment for all offshore areas. For the two Annex I habitats with offshore components — H1170 Reefs and H1180 Submarine structures made by leaking gases — the conclusions are unchanged whether offshore areas are included or not. This approach ensures a coherent Welsh picture while aligning with the UK-wide process.

The reporting period for this report is 2019–2024 and includes all Annex I habitats, Annex II, IV and V species, and all wild bird species populations occurring in Wales, including those using offshore waters, such as seabirds, and other marine species.

Favourable Conservation Status, assessment categories, and reference values

Under Article 1 of the Habitats Directive, the conservation status of a habitat is defined as the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure, functions, and survival. It is considered favourable when its natural range and the areas it covers are stable or increasing; the specific structure and functions necessary for its long-term maintenance exist and are likely to continue; and the conservation status of its typical species is also favourable.

For a species, conservation status is defined as the sum of the influences acting on it that may affect the long-term distribution and abundance of its populations. It is considered favourable when population dynamics indicate it is maintaining itself on a long-term basis as a viable component of its natural habitats; its natural range is neither being reduced nor is likely to be reduced for the foreseeable future; and sufficient habitat exists, and will probably continue to exist, to sustain its populations in the long term.

In this report, these definitions are applied to judge Favourable Conservation Status (FCS) for each Annex I habitat and Annex II, IV, and V species (excluding birds). FCS reflects whether a habitat or species is in a healthy and sustainable state, assessed through a set of supporting parameters. For habitats, these parameters are Range, Area, Structure and functions, and Future Prospects. For non-bird species, they are Population, Range, Habitat for the species, and Future Prospects.

Each parameter, and the resulting overall conclusion, is assessed using one of four standard categories:

- Favourable – in good condition, with no significant pressures or threats, and expected to remain so.
- Unfavourable–inadequate – not in good condition but could recover with appropriate measures, although some pressures or threats are present.
- Unfavourable–bad – in poor condition, facing major pressures or threats, and at serious long-term risk.
- Unknown – insufficient information to reach a reliable conclusion.

These categories follow definitions set out in the European Commission's reporting guidance for the Habitats and Birds Directives and are applied consistently across all reporting countries, allowing UK- and European-scale comparisons. This is the first time that FCS assessments have been undertaken specifically for Wales; in previous Article 17 reporting rounds, assessments were produced at the UK level, so there is no direct comparison with earlier results.

Where possible, trends are also provided for habitats and non-bird species, showing whether their status is improving, deteriorating, or stable. Further detail on the methods, assessment criteria, and data sources is provided in the UK Approach Document hosted by JNCC, which sets out the common methodology used across all four UK countries.

A key part of assessing FCS is the use of Favourable Reference Values (FRVs). These set the benchmark for the minimum natural range (Favourable Reference Range, FRR), surface area (Favourable Reference Area, FRA), or population size (Favourable Reference Population, FRP) required for a habitat or species to be considered in a healthy and sustainable state. FRVs are long-term thresholds against which current conditions are compared, providing the reference point for interpreting assessment results and identifying the scale of any shortfall.

For this reporting round, the starting point for each FRV was the most recent UK-level value established by JNCC. These values were developed using an audit trail process that records when the FRV was first set, the evidence used, and any subsequent revisions. The process draws on data and expert judgement from previous Article 17 reporting rounds (2007, 2013, and 2019) and the rationale used in the 2019 reporting.

Each UK-level FRV, defined as an operator (e.g. a percentage range rather than an absolute value), was reviewed by Welsh experts to assess its suitability in the context of Wales's current extent, distribution, population trends, pressures, and ecological characteristics for each feature. In many cases, the UK-level FRV was considered appropriate and adopted directly for Wales, particularly where evidence indicated that ecological trends and conditions in Wales aligned with those at the UK level. Where the UK-level FRV was not representative of Welsh conditions, a Wales-specific FRV was developed using national-scale evidence on habitat condition, trends, and species population and distribution.

This approach ensures that FRVs for Wales reflect local circumstances rather than simply replicating the UK figure, allowing for adjustments where the Welsh situation differs — for example, to recognise stable or unchanged ranges for certain features, or to highlight higher extinction risk for populations that are more vulnerable in Wales than elsewhere in the UK.

Birds species' status and trends

The 1st Wales Habitats Regulations Birds Report broadly follows the format established by the 11th Article 12 report, which gave emphasis to reporting on the status and trends of UK bird species. This reporting round, under Regulation 9A of the Conservation of Habitats and Species Regulations 2017 (as amended in Wales), birds reporting is provided at the Wales scale.

The list of wild bird species included in the Habitats Regulations birds report is predominantly based on those included in the 2019 UK Article 12 report. All the species covered by Article 12 are regularly occurring breeding species or regularly occurring migratory species. The Article 12 list was amended to ensure the most relevant UK species and sub-species were included. Bird species that visit the UK to breed may be different from those spending the winter here, which have bred elsewhere, therefore the Article 12 approach of separately reporting on 'species populations' rather than simply on individual species was followed. A species population denotes a species or subspecies during the breeding season, passage or winter.

The concept of Favourable Conservation Status (FCS), used to assess habitats and non-bird species status under the Habitats Directive is not part of Birds Directive reporting. The format and specific requirements of the of Birds Directive species reports are laid out in guidance issued by the European Commission. Instead, assessments for bird species focus on population size, distribution, and trends. Additionally this report will cover changes in key reporting metrics: distribution, pressures, conservation measures, Special Protection Area (SPA) information (population size and trend), international Species Action Plans/Management plans and hunting bag totals. Population estimates and trends are determined at the UK scale, with results relevant to Wales presented. The method statement for all bird related reporting metrics are provided in the Approach Document.

Pressures, conservation measures, and future prospects

As part of each assessment—including those covering birds, habitats and non-bird species—we identify the main pressures currently affecting them, along with the conservation measures in place or needed to address these pressures.

Pressures are activities or influences that affect the long-term viability of a habitat or species. These can include, for example, agricultural practices, resource extraction, pollution, or climate-related changes. Each pressure is ranked according to its impact (high, medium, or low) and categorised as past, ongoing, or likely to occur in the future. While pressures may be grouped under broad themes such as "agriculture" or "climate change," the assessments record the specific pressures relevant to each feature. For reporting purposes, only medium- and high-ranked pressures are included in the formal submission for non-bird species and habitats, with low-ranked

pressures used as an internal reference by NRW. However, for bird features, low, medium and high pressures are all reported.

Conservation measures are the actions needed to maintain or restore a feature to Favourable Conservation Status. These can include, for example, habitat restoration, changes in land management, or measures to reduce disturbance. For each feature, we assess whether conservation measures are needed, whether they have been implemented, and their anticipated effectiveness in the next 12 years. Measures are also grouped under broad themes but selected specifically for each feature based on the pressures identified.

Future prospects reflect the expected direction of change in a habitat's or species' conservation status over the next 12 years (covering the two reporting periods after the current one, to 2035). This assessment combines the current status of each parameter (such as range, population, habitat quality, or structure and functions) with the balance between ongoing pressures, anticipated future threats, and the conservation measures being taken or planned. Future prospects are concluded as Good, Poor, Bad, or Unknown.

In this way, pressures and conservation measures are not only reported in their own right but directly inform the projection of whether a feature's condition is expected to improve, deteriorate, or remain stable in the foreseeable future. Full details of the definitions, ranking criteria, and decision rules used in these assessments are provided in the UK Approach Document hosted by JNCC.

Methodology

The methods used for these assessments follow the agreed UK-wide approach set out in the UK Approach Document hosted by JNCC. This document provides full details on how each field in the assessment forms is completed, how different types of evidence are combined and interpreted, and how conclusions on conservation status and trends are reached. It also describes the decision rules, thresholds, and definitions used to ensure consistency across the UK, and records where approaches differ between the four UK countries — for example, in the treatment of nitrogen deposition assessments or the selection of typical species.

A key part of the assessment process is the use of maps to illustrate distribution and range. Distribution maps at a 10 x 10 km square scale were compiled by expert specialists using the data sources described in the *Data Sources and Quality* section. These maps show the known presence of each habitat or species within Wales. For most terrestrial and freshwater features, range maps were then derived from these distribution datasets by JNCC on our behalf, following the methods described in the Approach Document. For marine habitats, no additional range map is produced — the same 10 x 10 km squares shown for distribution are also used to represent range. All mapping reflects the best available evidence for the reporting period and the agreed mapping methods set out in the Approach Document.

This is the first Wales-level Habitats Regulations 9A assessment, moving from previous UK-level reporting to a country-specific approach. While the framework remains consistent with the UK Approach Document and previous Article 17 and Article 12 reporting, there have been some notable updates to methods and

guidance since the 2019 round. These include an expanded and revised list of pressures, an updated and reorganised list of conservation measures, and revised critical levels for nitrogen deposition assessments to reflect the latest evidence. In addition, several smaller adjustments have been made to definitions, thresholds, and decision rules. These changes may influence some results compared with previous rounds, and full details are provided in the UK Approach Document hosted by JNCC.

Data sources and resources

Evidence used in this report comes from a wide range of sources, including NRW's own monitoring programmes, partner agency and NGO surveys, research institution datasets, and citizen science schemes supported by volunteer networks. All data have undergone quality assurance and expert review to ensure consistency with agreed reporting standards. The availability of data for this reporting round has been affected by external factors: COVID-19 restrictions limited fieldwork and survey opportunities during parts of the reporting period, leading to reduced data coverage for some features; similarly, the impact of avian influenza on wild bird populations affected the amount and reliability of data available for certain species. NRW is grateful to all the organisations, research bodies, and individuals who contributed data, and recognises their continued commitment to monitoring despite these challenges. This includes the contributions of an external contractor, who undertook assessments for selected features and provided expert input to the evidence base. All datasets are used with the agreement of the data providers, and their contributions are fully acknowledged within the relevant sections of the report.

For most habitat and species features assessed in this report, at least some new evidence has been incorporated since the previous reporting round. However, due to the absence of an NRW upland specialist during this period, no new data was added to the evidence base for the following upland features: H8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*), H8120 Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*), H8210 Calcareous rocky slopes with chasmophytic vegetation, H8220 Siliceous rocky slopes with chasmophytic vegetation, and H8310 Caves not open to the public. For these features, the assessments are based on evidence from the 2013–2018 reporting round, carried forward without additional new data. Although no new evidence was added, the information was reviewed to ensure it remained consistent with the current reporting format and aligned with any relevant updates to methods or classification.

For wild bird populations the principal sources of data are broadly the same as previous Article 12 Bird Reports and are described in detail in the Approach Document.

Vagrant species

In previous UK-level Article 17 reporting, certain species which occur only occasionally within UK waters or territory — known as vagrants — have been included in order to meet EU reporting guidance. Under both past and current EU guidance, vagrants are species without stable or regular occurrence in a region; they are reported to ensure the EU biogeographical assessment reflects the species' full European range, even if only limited information is available and no full conservation

status assessment is possible. For the 2025 Habitats Regulations report, the UK will continue to report on six terrestrial and 14 marine vagrant species at the UK level. However, these are not assessed within this Wales-level report as they do not meet the criteria for regular occurrence here. Terrestrial vagrant species in the current UK list include Common sturgeon (*Acipenser sturio*), Northern bat (*Eptesicus nilssonii*), Pond bat (*Myotis dasycneme*), Geoffroy's bat (*Myotis emarginatus*), Greater mouse-eared bat (*Myotis myotis*), Particoloured bat (*Vespertilio murinus*), and Kuhl's pipistrelle (*Pipistrellus kuhlii*). For marine vagrant species, assessments have been carried out at the UK level, and the evidence provided for these has been included in the technical appendices to this report.

Species outside current reporting scope

The Eurasian beaver (*Castor fiber*) is not included in the Wales-level Habitats Regulations 9A assessments for this reporting round. At the time the assessments were prepared, beavers did not have formal legal protection in Wales and were therefore not subject to reporting requirements under the Habitats Regulations. The Welsh Government is in the process of seeking to add beaver to Schedule 2 of the Regulations, which would provide this protection. As no legislative change took place during the reporting period this species has not been assessed on this occasion.

Structure of the report

This Wales Habitats Regulations 9A report is organised to reflect both the statutory requirements of Regulation 9A and the established UK/EU reporting framework used in previous Article 17 (Habitats Directive) and Article 12 (Birds Directive) reporting cycles.

This report presents the results of the 2019–2024 assessments in both summary and detailed form. The components within this **Habitats Regulations 9A Wales Summary Report** are:

- Summary of results for habitats and non-bird species
- Birds species' status and trends
- One-page summaries for each reported feature (habitats and non-bird species)

To support and provide further detail, the following technical appendices accompany this report:

- **Habitats Regulations 9A Implementation Report**

This appendix combines the General Implementation Report and the Birds General Report, which were previously presented separately in earlier reporting cycles. It retains the same level of detail and provides essential context for the feature-level assessments.

The combined implementation report provides an overview of how the Habitats and Birds Directives are being applied in Wales. It covers the legislative and policy framework, the designation and management of protected sites, and wider measures that contribute to meeting the Directive's objectives. It also summarises the legal protection of birds and key conservation actions for bird populations in Wales. This

technical appendix sets the policy and management context for the assessments presented in the main summary report.

- **Methodology**

A UK Approach Document hosted by JNCC, detailing the methodology used during this reporting round.

- **Habitats data**
  - Individual evidence documents for 61 habitats
  - Wales habitats supporting information data
  - Wales habitats conclusions

- **Non-bird species data**
  - Individual evidence documents for 53 non-bird species
  - Wales non-bird species supporting information data
  - Wales non-bird species conclusions

- **Marine species data**
  - Individual evidence documents for 27 marine species at UK and relevant marine management unit level (including 14 marine species that are vagrant within Welsh waters)
  - UK and MU marine species supporting information data
  - UK and MU marine species conclusions

- **Birds data**
  - Population estimates and trends
  - Changes in UK conservation status (BoCC) and GB extinction risk (IUCN) for populations and species
  - Pressures
  - Conservation measures
  - Proportion of a species' population within the UK Special Protection Area (SPA) network
  - Species Action Plans

- **Change in Seabird Breeding Occupancy**

- **Bird guild assessments**

  For three bird guilds (breeding seabirds, breeding waterbirds and woodland birds) detailed summaries have been produced on the basis that Wales holds internationally important populations or significant proportions of the UK populations. The other guilds (breeding waders, farmland birds and upland birds) do not have detailed summaries, but are covered within Birds section of this Habitats Regulations 9A summary report.

This structure ensures that the main report presents concise summary information, while the technical appendices provide detailed context, policy background, and direct access to the full datasets underpinning the assessments.

3. Summary results for habitats and non-bird species

For ease of presentation and interpretation, the habitats and non-bird species reported under Habitats Regulations 9A have been grouped into broad ecological categories. These groupings help to summarise patterns and trends across related features while recognising that each Annex I habitat and Annex II, IV, or V species has its own specific ecological requirements and conservation needs.

For species, the groups used are bats, fish, molluscs, non-vascular plants (such as bryophytes and lichens), other invertebrates, other mammals, and vascular plants. For habitats, the groups used are coastal and dunes, freshwater, grasslands, heaths, marine, uplands, wetlands, and woodlands.

It is important to note that some habitats — particularly in the marine and coastal environment — naturally occur together or overlap. For example, mudflats and sandflats may be found within estuaries, saltmarsh can fringe both estuarine and coastal areas, and dune systems can grade into coastal grassland. While these are presented as distinct reporting units, such overlaps should be borne in mind when interpreting maps, figures, and summary results.

Marine mammals and turtles are important components of Welsh marine biodiversity. We have provided summaries for three marine mammal species (Bottlenose dolphin (*Tursiops truncatus*), Harbour porpoise (*Phocoena phocoena*) and Grey seal (*Halichoerus grypus*) that are common in Welsh waters. Both Bottlenose dolphin and Harbour porpoise also have regional Management Units. No Wales-level assessment or summary has been made for other common or rare marine mammal and turtle species usually found in Wales (see section on marine species for details), because their populations and conservation status are better assessed at a broader UK spatial scale. Other marine mammal and turtle species which are considered to be vagrant in Welsh waters are not considered further (see section on marine species for details), but their detailed species assessments are available at the UK level within the technical appendices.

3.1 Summary of conclusions

A summary of the overall conclusions and qualifiers included in this first Habitats Regulations 9A report for Wales is provided in Table 3.1. The summary is also available within the technical appendices for non-bird species conclusions, habitats conclusions and marine species conclusions.

Table 3.1 Summary of the conclusions and qualifiers reached for each habitat and species included in the first Habitats Regulations 9A report for Wales.

Overall conservation status and trend	Species	Marine species	Habitats
Favourable-improving	2	0	0
Favourable-stable	12	4	2
Favourable-deteriorating	0	0	0
Favourable-unknown	0	0	0
Total Favourable	**14**	**4**	**2**
Inadequate-improving	1	0	1
Inadequate-stable	7	1	4
Inadequate-deteriorating	8	0	1
Inadequate-unknown	2	1	3
Total Unfavourable-inadequate	**18**	**2**	**9**
Bad-improving	2	0	0
Bad-stable	1	1	12
Bad-deteriorating	12	0	15
Bad-unknown	1	0	21
Total Unfavourable-bad	**16**	**1**	**48**
Unknown	5	5	2
Total Unknown	**5**	**5**	**2**
Grand total	**53**	**12**	**61**

Species conclusions

Of the 53 terrestrial species assessed in Wales (Figure 3.1), 14 were found to be in favourable condition. Among these, two species showed improving trends, while the remaining 12 were considered stable. A further 18 species were assessed as being in unfavourable–inadequate condition. Of these, one species exhibited an improving trend, seven were stable, eight were deteriorating, and two had trends that could not be determined. Sixteen species were found to be in unfavourable–bad condition, with two showing improving trends, one considered stable, one unknown and the remaining 12 all exhibiting deteriorating trends. The status of five species could not be determined due to insufficient data. For full details of conclusions reached for species in Wales see Table 3.2.

Of the 12 non-vagrant marine species that occur in Welsh waters, four were found to be in Favourable condition with their trend considered stable. A further two species were assessed as being in Unfavourable–Inadequate condition. Of these, one

species exhibited a stable trend and one had a trend that could not be determined. One species was found to be in Unfavourable–Bad condition, and was considered stable. The status of five species could not be determined due to insufficient data. For full details of conclusions reached for marine species in Wales see Table 3.3.

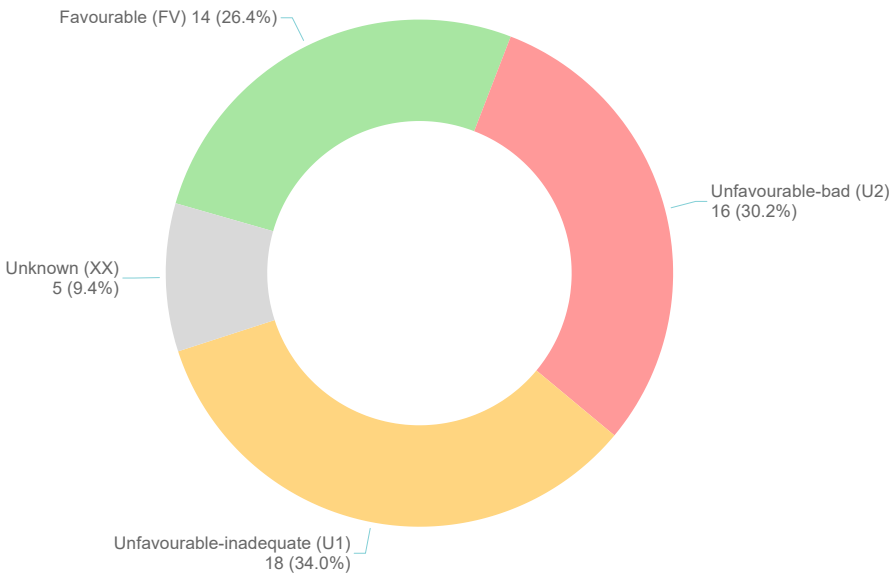


Figure 3.1 Overall conservation status of non-bird species in Wales not including marine species (2019-2024 reporting). Download underlying data for this figure (Excel).

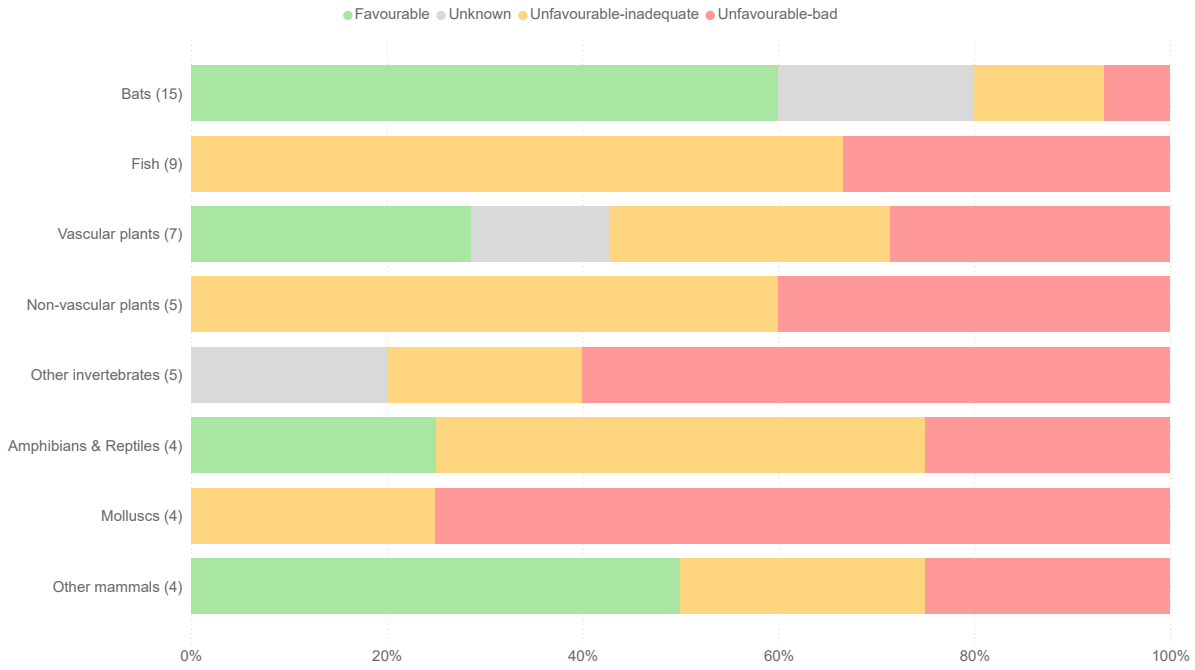


Figure 3.2 Overall conservation status of species in Wales split by species group, not including marine species (2019-2024 reporting). Download underlying data for this figure (Excel).

Table 3.2 Favourable Conservation Status assessment by non-bird species showing status (Favourable (FV), Unfavourable-inadequate (U1), Unfavourable-bad (U2), Unknown (XX)) and trends (Improving (+), Deteriorating (-), Unknown (x), Stable (=)). Overall status and trend from the 2019 Article 17 reporting provided for reference although note those values are for the whole UK. Not including marine species.

Grouping	Species code	Common name	2025 Overall status Wales	2025 Overall trend Wales	2019 Overall status UK	2019 Overall trend UK	2025 Range Wales	2025 Population Wales	2025 Habitat for species Wales	2025 Future prospects Wales
Amphibians and reptiles	S1166	Great crested newt	U1	-	U1	-	FV	U1	XX	XX
Amphibians and reptiles	S1213	Common frog	FV	=	FV	=	FV	FV	FV	FV
Amphibians and reptiles	S1261	Sand lizard	U1	+	U1	+	U1	U1	FV	U1
Amphibians and reptiles	S6284	Natterjack toad	U2	-	U2	=	U1	U2	FV	U2
Bats	S1303	Lesser horseshoe bat	FV	+	FV	+	FV	FV	FV	FV
Bats	S1304	Greater horseshoe bat	FV	+	FV	+	FV	FV	FV	FV
Bats	S1308	Barbastelle	U1	x	XX	x	U1	XX	XX	XX
Bats	S1309	Common pipistrelle	FV	=	FV	+	FV	FV	FV	FV
Bats	S1312	Noctule	FV	=	FV	=	FV	FV	FV	FV
Bats	S1314	Daubenton's bat	FV	=	FV	=	FV	FV	FV	FV
Bats	S1317	Nathusius' pipistrelle	XX		XX		XX	XX	XX	XX
Bats	S1320	Brandt's bat	XX		FV	=	XX	XX	FV	XX
Bats	S1322	Natterer's bat	FV	=	FV	=	FV	FV	FV	FV
Bats	S1323	Bechstein's bat	U2	x	XX		U2	XX	XX	XX
Bats	S1326	Brown long-eared bat	FV	=	FV	=	FV	FV	FV	FV
Bats	S1327	Serotine	U1	x	FV	=	U1	XX	XX	XX
Bats	S1330	Whiskered bat	FV	=	FV	=	FV	XX	FV	FV
Bats	S1331	Leisler's bat	XX		FV	=	XX	XX	XX	XX
Bats	S5009	Soprano pipistrelle	FV	=	FV	=	FV	FV	FV	FV
Fish	S1095	Sea lamprey	U1	=	XX	x	FV	U1	U1	U1
Fish	S1096	Brook lamprey	U1	=	XX		FV	FV	U1	U1
Fish	S1099	River lamprey	U1	=	FV	x	FV	FV	U1	U1
Fish	S1102	Allis shad	U2	=	U1	=	U1	U2	U1	U2
Fish	S1103	Twaite shad	U2	+	U1	=	FV	U2	U1	U2
Fish	S1106	Atlantic salmon	U2	-	U1	=	U1	U2	U2	U2
Fish	S1109	Grayling	U1	=	U1	=	FV	FV	U1	U1

Grouping	Species code	Common name	2025 Overall status Wales	2025 Overall trend Wales	2019 Overall status UK	2019 Overall trend UK	2025 Range Wales	2025 Population Wales	2025 Habitat for species Wales	2025 Future prospects Wales
Fish	S6353	Whitefish	U1	=	U2	=	FV	U1	U1	U1
Fish	S6965	Bullhead	U1	=	FV	=	FV	FV	U1	U1
Molluscs	S1013	Geyer's whorl snail	U2	-	U1	-	U2	U2	U2	U2
Molluscs	S1014	Narrow-mouthed whorl snail	U1	-	U1	-	FV	U1	XX	U1
Molluscs	S1016	Desmoulin's whorl snail	U2	-	U2	-	FV	U2	XX	U2
Molluscs	S1029	Freshwater pearl mussel	U2	-	U2	-	U2	U2	U2	U2
Non-vascular plants	S1378	Cladonia subgenus Cladina subgenus of lichens	U2	-	U1	x	FV	U2	U1	U2
Non-vascular plants	S1395	Petalwort	U2	-	U2	-	U1	U2	U2	U2
Non-vascular plants	S1400	Large white-moss	U1	-	FV	x	FV	U1	U1	U1
Non-vascular plants	S1409	Bog-mosses	U1	-	U1	-	FV	U1	U1	U1
Non-vascular plants	S6216	Slender green feather-moss	U1	-	FV	=	FV	FV	XX	U1
Other invertebrates	S1034	Medicinal leech	U1	-	FV	+	FV	U1	XX	U1
Other invertebrates	S1044	Southern damselfly	U2	-	U1	-	U2	U2	U2	U2
Other invertebrates	S1065	Marsh fritillary butterfly	U2	-	U1	=	U2	U2	U2	U2
Other invertebrates	S1083	Stag beetle	XX		FV	=	XX	XX	XX	XX
Other invertebrates	S1092	White-clawed crayfish	U2	-	U2	-	U2	U2	XX	U2
Other mammals	S1341	Common dormouse	U2	-	U2	x	FV	U2	XX	U2
Other mammals	S1355	Otter	FV	=	FV	=	FV	FV	FV	FV
Other mammals	S1357	Pine marten	U1	=	FV	+	FV	U1	XX	FV
Other mammals	S1358	Polecat	FV	=	FV	+	FV	FV	FV	FV
Vascular plants	S1413	Clubmosses	U1	-	U1	x	XX	XX	XX	U1
Vascular plants	S1441	Shore dock	U2	-	U1	x	U2	U2	U2	U2
Vascular plants	S1654	Early gentian	XX		U2	x	FV	FV	XX	XX
Vascular plants	S1831	Floating water-plantain	U1	-	U1	-	FV	U1	U1	U1
Vascular plants	S1849	Butcher's broom	FV	=	FV	=	FV	FV	FV	FV
Vascular plants	S1903	Fen orchid	U2	+	U2	+	U2	U2	U1	U1
Vascular plants	S6985	Killarney fern	FV	=	FV	=	FV	FV	FV	FV

Table 3.3 Favourable Conservation Status assessment by marine species showing status (Favourable (FV), Unfavourable-inadequate (U1), Unfavourable-bad (U2), Unknown (XX)) and trends (Improving (+), Deteriorating (-), Unknown (x), Stable (=)). Overall status and trend from the 2019 Article 17 reporting provided for reference although note those values are for the whole UK. Values for bottlenose dolphin refer to the coastal ecotype within the Irish Sea Management Unit (MU); details of the combined UK assessment for coastal and offshore ecotypes are provided in the technical appendices. Values for harbour porpoise refer to the Celtic and Irish Seas MU; the overall UK assessment for this species is also available in the technical appendices.

Grouping	Species code	Common name	Country / MU	2025 Overall status Wales	2025 Overall trend Wales	2019 Overall status UK	2019 Overall trend UK	2025 Range Wales	2025 Population Wales	2025 Habitat for species Wales	2025 Future prospects Wales
Marine mammal	S1349	Bottlenose dolphin	MU Irish Sea	FV	=	Not assessed	Not assessed	FV	FV	XX	FV
Marine mammal	S1351	Harbour porpoise	MU Celtic and Irish seas	U2	=	Not assessed	Not assessed	FV	U2	XX	XX
Marine mammal	S1364	Grey seal	UK	FV	=	FV	+	FV	FV	XX	FV
Marine mammal	S1350	Common dolphin	UK	FV	=	XX		FV	FV	XX	FV
Marine mammal	S1365	Common seal	UK	U1	=	U1	X	FV	U1	XX	U1
Marine mammal	S2621	Fin whale	UK	XX		XX		FV	XX	XX	XX
Marine mammal	S1345	Humpback whale	UK	XX				FV	XX	XX	XX
Marine mammal	S2027	Killer whale	UK	XX		XX		FV	XX	XX	XX
Reptile	S1223	Leatherback turtle	UK	XX		XX		XX	XX	XX	XX
Marine mammal	S2029	Long-finned pilot whale	UK	XX		XX		FV	XX	XX	XX
Marine mammal	S2618	Minke whale	UK	U1	x	XX		FV	U1	XX	XX
Marine mammal	S2030	Risso's dolphin	UK	FV	=	XX		FV	FV	XX	FV

Habitats conclusions

Of the 61 habitats assessed in Wales (Figure 3.3), only two were found to be in favourable condition, both of which showed stable trends. A further nine habitats were assessed as being in unfavourable–inadequate condition. Among these, one habitat exhibited an improving trend, four were stable, one was deteriorating, and three had trends that could not be determined. Forty-eight habitats were found to be in unfavourable–bad condition, with 12 considered stable, 15 exhibiting deteriorating trends, and the remaining 21 having unknown trends. The status of two habitats could not be determined due to insufficient data. Full details of the conclusions reached for habitats in Wales are provided in Table 3.4.

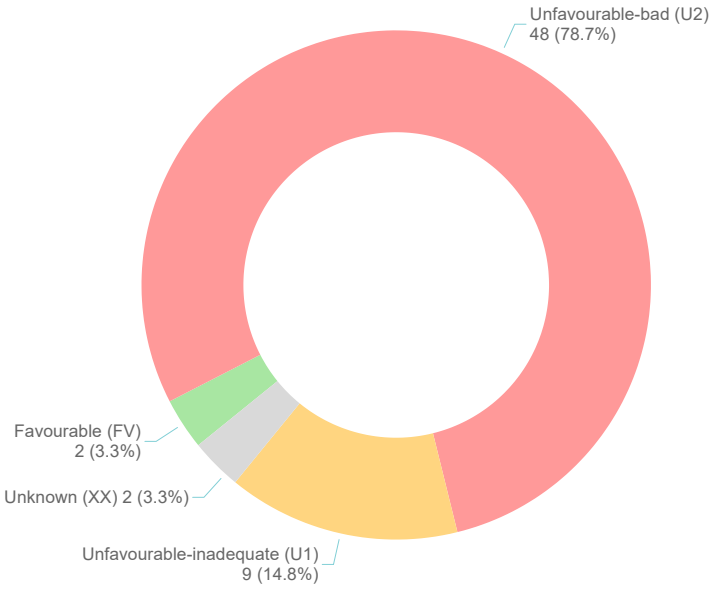


Figure 3.3 Overall conservation status of habitats in Wales (2019-2024 reporting). Download underlying data for this figure (Excel).

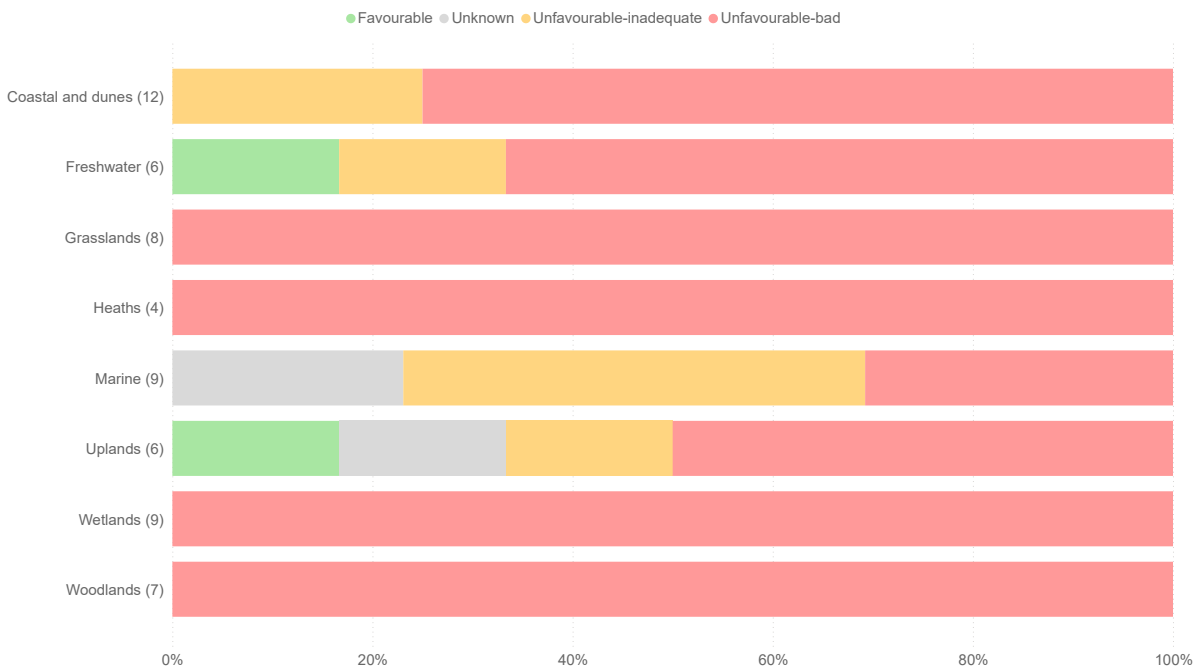


Figure 3.4 Overall conservation status of habitats in Wales split by group (2019-2024 reporting). Download underlying data for this figure (Excel).

Table 3.4 Favourable Conservation Status assessment by habitat showing status (Favourable (FV), Unfavourable-inadequate (U1), Unfavourable-bad (U2), Unknown (XX)) and trends (Improving (+), Deteriorating (-), Unknown (x), Stable (=)). Overall status and trend from the 2019 Article 17 reporting provided for reference although note those values are for the whole UK.

Grouping	Code	Habitat name	2025 Overall status Wales	2025 Overall trend Wales	2019 Overall status UK	2019 Overall trend UK	2025 Area Wales	2025 Range Wales	2025 Structure and functions Wales	2025 Future prospects Wales
Coastal and dunes	H1210	Annual vegetation of drift lines	U1	x	U2	X	U1	U1	U1	U1
Coastal and dunes	H1220	Perennial vegetation of stony banks	U2	x	U2	=	U2	FV	XX	U2
Coastal and dunes	H1230	Vegetated sea cliffs	U2	-	U2	-	U1	FV	XX	U2
Coastal and dunes	H1310	Salicornia	U1	x	U2	X	U1	XX	FV	XX
Coastal and dunes	H1330	Salt meadows	U2	-	U2	-	U1	FV	U2	U2
Coastal and dunes	H1420	Mediterranean scrubs	U1	x	U2	=	U1	XX	XX	U1
Coastal and dunes	H2110	Embryonic shifting dunes	U2	-	U2	-	U1	FV	U1	U2
Coastal and dunes	H2120	Shifting with marram	U2	=	U2	-	U1	FV	U2	U2

Grouping	Code	Habitat name	2025 Overall status Wales	2025 Overall trend Wales	2019 Overall status UK	2019 Overall trend UK	2025 Area Wales	2025 Range Wales	2025 Structure and functions Wales	2025 Future prospects Wales
Coastal and dunes	H2130	Dune grassland	U2	=	U2	-	U1	FV	U2	U2
Coastal and dunes	H2150	Decalcified fixed dunes	U2	x	U2	-	U1	FV	U2	U2
Coastal and dunes	H2170	Dunes with Salix repens	U2	x	U2	-	U1	FV	U2	U2
Coastal and dunes	H2190	Humid dune slacks	U2	x	U2	-	U1	FV	U2	U2
Freshwater	H3130	Oligo to meso standing waters	U2	-	U2	=	FV	FV	U2	U2
Freshwater	H3140	Hard oligo-meso with Chara	U2	-	U2	=	FV	FV	U2	U2
Freshwater	H3150	Natural eutrophic lakes	U2	=	U2	-	FV	FV	U2	U2
Freshwater	H3160	Dystrophic lakes	U1	+	U2	=	FV	FV	U1	U1
Freshwater	H3180	Turloughs	FV	=	U2	=	FV	FV	XX	FV
Freshwater	H3260	Ranunculion	U2	=	U2	+	FV	FV	U2	U2
Grasslands	H6130	Calaminarian	U2	-	U2	-	U1	FV	U2	U2
Grasslands	H6150	Siliceous alpine	U2	=	U2	+	U1	FV	U2	U2
Grasslands	H6170	Alpine grasslands	U2	=	U2	-	FV	FV	FV	U2
Grasslands	H6210	Semi-natural dry grasslands	U2	-	U2	=	U2	FV	U2	U2
Grasslands	H6230	Species-rich Nardus	U2	x	U2	+	U1	FV	U2	U2
Grasslands	H6410	Molinia meadows	U2	-	U2	=	U2	FV	U2	U2
Grasslands	H6430	Hydrophilous tall herb fringe	U2	x	U2	+	XX	FV	U2	U2
Grasslands	H6510	Lowland hay meadows	U2	=	U2	-	U2	FV	XX	U2
Heaths	H4010	Wet heaths	U2	x	U2	-	U1	FV	XX	U2
Heaths	H4030	European dry heaths	U2	x	U2	+	XX	FV	U1	U2
Heaths	H4060	Alpine and Boreal heaths	U2	=	U2	+	U1	FV	U2	U2
Heaths	H5130	Juniperus heaths	U2	x	U2	=	XX	XX	XX	U2
Marine	H1110	Sandbanks	U1	=	U2	X	FV	FV	U1	XX
Marine	H1130	Estuaries	U1	=	U2	X	FV	FV	U1	U1
Marine	H1140	Mudflats and sandflats	U2	-	U2	X	U1	FV	U2	U2
Marine	H1150	Coastal lagoons	U2	-	U1	=	U1	FV	U2	U2
Marine	H1160	Inlets and bays	U2	=	U1	=	FV	FV	U2	U2
Marine	H1170	Reefs	U1	-	U1	X	U1	XX	U1	U1
Marine	H1180	Submarine structures made by leaking gases	XX		XX		XX	XX	FV	XX
Marine	H8330	Sea caves	U1	=	U1	=	XX	FV	U1	XX
Marine	S1376-S1377	Maerl beds	U2	=	XX		U2	FV	U2	U2
Uplands	H8110	Siliceous scree	XX		U1	+	XX	XX	XX	XX
Uplands	H8120	Calcareous scree	U2	x	U2	=	XX	XX	U2	XX
Uplands	H8210	Calcareous rocky slopes	U2	x	U2	+	XX	FV	U2	XX
Uplands	H8220	Siliceous rocky slopes	U2	x	U1	=	XX	XX	U2	XX
Uplands	H8240	Limestone pavements	U1	=	U2	+	FV	FV	XX	U1
Uplands	H8310	Caves not open to the public	FV	=	FV	=	FV	FV	XX	FV
Wetlands	H7110	Active raised bogs	U2	=	U2	+	U2	FV	U2	U2

Grouping	Code	Habitat name	2025 Overall status Wales	2025 Overall trend Wales	2019 Overall status UK	2019 Overall trend UK	2025 Area Wales	2025 Range Wales	2025 Structure and functions Wales	2025 Future prospects Wales
Wetlands	H7120	Degraded raised bogs	U2	-	U2	+	U1	U1	U2	U2
Wetlands	H7130	Blanket bogs	U2	-	U2	=	U2	U1	U2	U2
Wetlands	H7140	Transition mires	U2	-	U2	=	U1	XX	U2	U2
Wetlands	H7150	Rhynchosporion	U2	x	U2	=	XX	FV	U1	U2
Wetlands	H7210	Calcareous fens with Cladium	U2	-	U2	+	U2	U1	U2	U2
Wetlands	H7220	Petrifying springs with tufa	U2	x	U2	-	U1	XX	XX	U2
Wetlands	H7230	Alkaline fens	U2	-	U2	=	U2	U1	U2	U2
Wetlands	H7240	Alpine pioneer formations	U2	x	U2	+	XX	XX	XX	U2
Woodlands	H9120	Acidophilous beech forests	U2	x	U2	=	U1	FV	XX	U2
Woodlands	H9130	Asperulo-Fagetum beech forests	U2	x	U2	=	U1	FV	XX	U2
Woodlands	H9180	Tilio-Acerion forests	U2	=	U2	=	U1	FV	U2	U2
Woodlands	H91A0	Old sessile oak woods	U2	x	U2	=	U1	FV	XX	U2
Woodlands	H91D0	Bog woodland	U2	x	U1	+	U1	FV	XX	U2
Woodlands	H91E0	Alluvial forests	U2	x	U2	=	U1	FV	XX	U2
Woodlands	H91J0	Taxus baccata woods	U2	x	U2	=	XX	FV	U2	U2

3.2 Pressures

Considering both the high and medium level pressure rankings there were 84 separate pressures identified as acting on habitats and 87 pressures acting on non-bird species. Pressures were grouped into 14 broad categories (e.g. 'Agriculture-related practices') for the purposes of analysis (see Appendix 8 of the Approach Document). Where multiple individual pressures were reported under the same broad category for a given species or habitat, they were counted as a single occurrence of that pressure category in the analysis, rather than as multiple distinct pressures. The pressure category 'Development, construction and use of residential, commercial, industrial and recreational infrastructure and areas' has been abbreviated to 'Urban and infrastructure development' for clarity in the figures that follow. The pressure category "Extraction and cultivation of biological living resources (other than agriculture and forestry)" has also been shortened to "Extraction and cultivation of biological resources (excl. agriculture and forestry)".

The method statement is found in the Approach Document and the details of pressures impacting on individual features are available within the full evidence text in the Technical Appendix.

Key findings of pressures for species

Agriculture-related practices were the most commonly reported pressure category for species. When both high and medium-ranked pressures were considered (Figure 3.5), they affected 44 of the 53 species assessed. Even when focusing only on high-

ranked pressures (Figure 3.6), agriculture remained the most frequently selected pressure, impacting 27 species.

Forestry and climate change were also associated with a high number of species under pressure, affecting 29 and 26 species respectively when high and medium-ranked pressures were combined (Figure 3.5). However, the proportion of these pressures ranked as high was lower: only 12 species were affected by forestry related pressures and 10 by climate change at the high level (Figure 3.6). In contrast, urban and infrastructure development pressures affected 21 species overall (Figure 3.5), with a relatively high proportion—16 species—experiencing these pressures at a high level (Figure 3.6).

The influence of specific species groups is evident in these results. Bats, which make up the largest species group assessed (15 species), were particularly affected by several high-ranked pressures. Ten bat species were impacted by urban and infrastructure development, 13 by the development and operation of transport systems, nine by forestry-related practices, and seven by agriculture-related practices. These high numbers within a single group contribute significantly to the overall pressure totals.

Agriculture-related practices were also a high-ranked pressure for other species groups: six out of nine fish species, three out of four mollusc species, five out of five vascular plant species, and three out of five other invertebrates were affected. Urban and infrastructure development pressures were high for four out of five vascular plant species.

Fish species were notably impacted by water-related pressures. Seven out of nine fish species were affected by human-induced changes in water regimes at a high level. Additionally, five out of nine fish species experienced high-ranked pressures from both energy production processes and mixed source pollution.

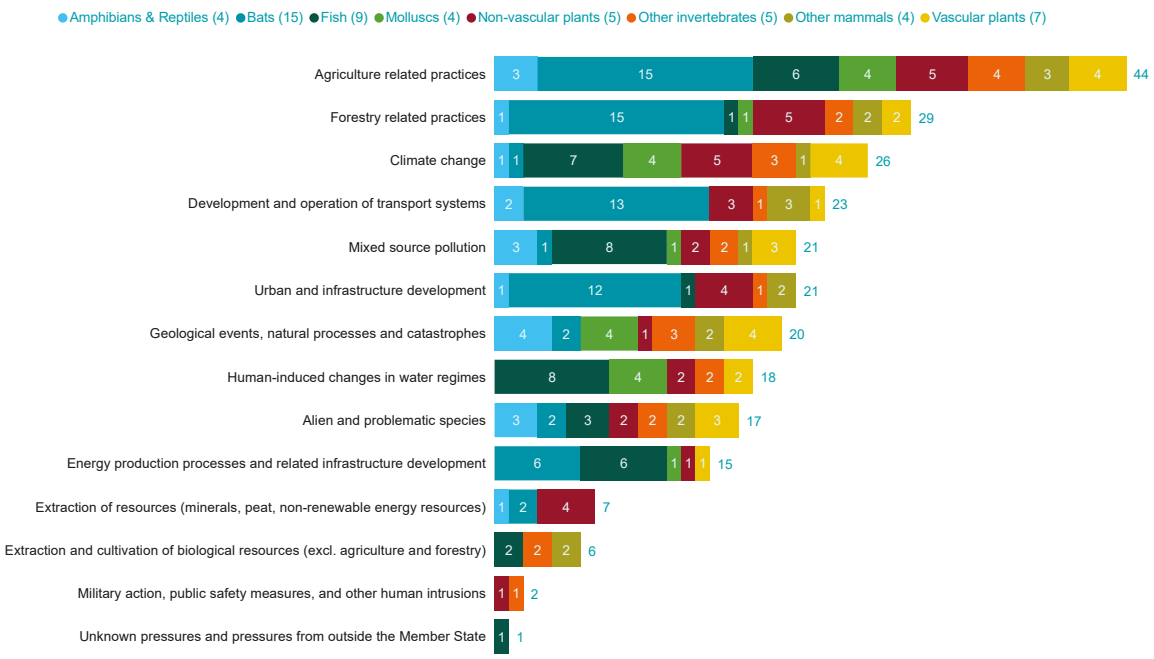


Figure 3.5 Number of species impacted by pressure category (Medium and High pressure rankings combined). Number in legend indicates how many features are in that category across the groups of amphibians & reptiles (4), bats (15), fish (9), molluscs (4), non-vascular plants (5), other invertebrates (5), other mammals (4) and vascular plants (7). Download underlying data for this figure (Excel).

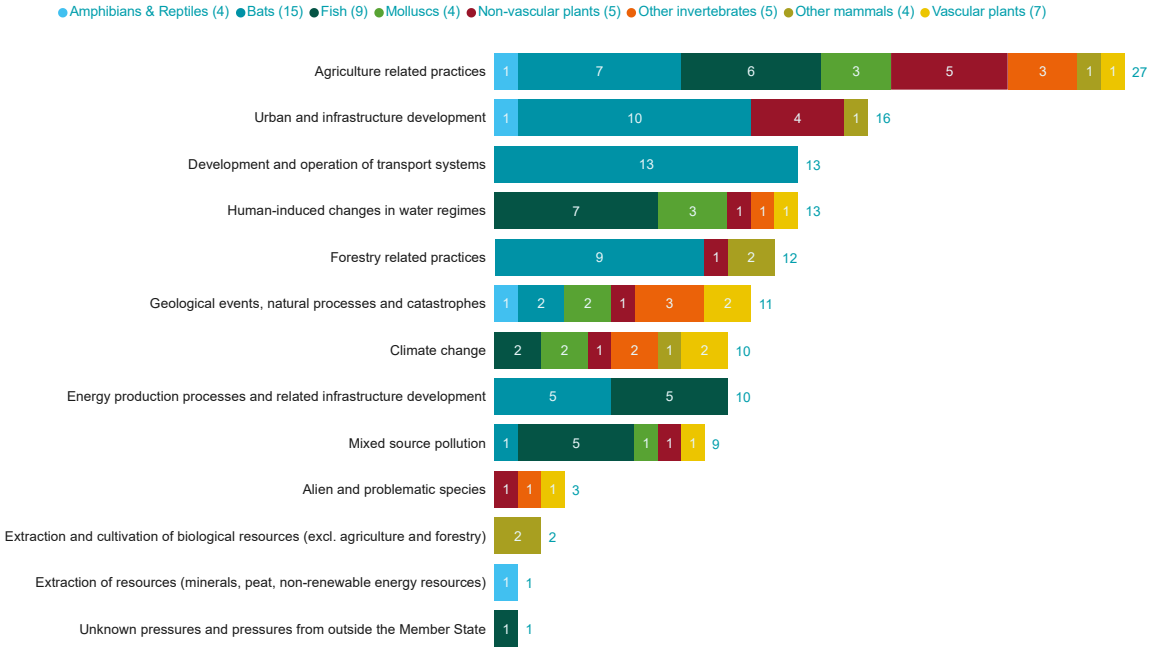


Figure 3.6 Number of species impacted by pressure category (High pressure ranking only). Number in legend indicates how many features are in that category across the groups of amphibians & reptiles (4), bats (15), fish (9), molluscs (4), non-vascular plants (5), other invertebrates (5), other mammals (4) and vascular plants (7). Download underlying data for this figure (Excel).

Key findings of pressures for habitats

Mixed source pollution was the most widespread high and medium-ranked pressure, affecting 55 out of the 61 habitats assessed (Figure 3.7). Even when considering only high-ranked pressures, it remained the most significant, impacting 46 habitats (Figure 3.8). This pressure was particularly prevalent across all habitat types: it affected 9 out of 12 coastal and dune habitats, all grassland (8/8), heath (4/4), and wetland habitats (9/9), as well as 5 out of 6 upland and 6 out of 7 woodland habitats (Figure 3.8).

Agriculture-related practices were also a major pressure, impacting 52 habitats when high and medium-ranked pressures were combined (Figure 3.7), and 43 habitats at a high-ranked pressure level (Figure 3.8). High-ranked agricultural pressures were reported for all heath (4/4) and wetland habitats (9/9), the majority of grasslands (7/8), uplands (5/6), and freshwater habitats (5/6). Coastal and dune habitats were affected in 6 out of 12 cases, and woodlands in 3 out of 6 (Figure 3.8).

Climate change pressures were recorded for 54 habitats when high and medium-ranked pressures were considered together (Figure 3.7), with 25 of those being high-ranked (Figure 3.8). Urban and infrastructure development affected 46 habitats overall (Figure 3.7), with 19 experiencing high-ranked pressures (Figure 3.8). Alien and problematic species were reported for 44 habitats (Figure 3.7), with 29 of those pressures ranked as high (Figure 3.8).

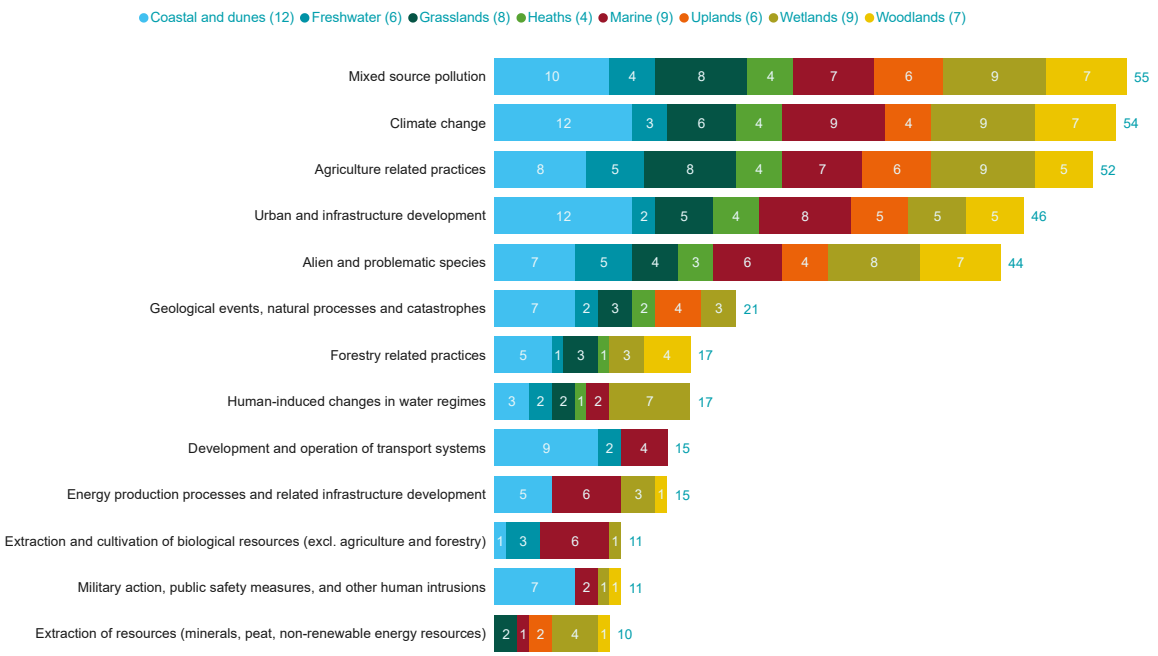


Figure 3.7 Number of habitats impacted by pressure category (Medium and High pressure rankings combined). Number in legend indicates how many features are in that category across groups coastal and dunes (12), freshwater (6), grasslands (8), heaths (4), marine (9), uplands (6), wetlands (9) and woodlands (7). Download underlying data for this figure (Excel).

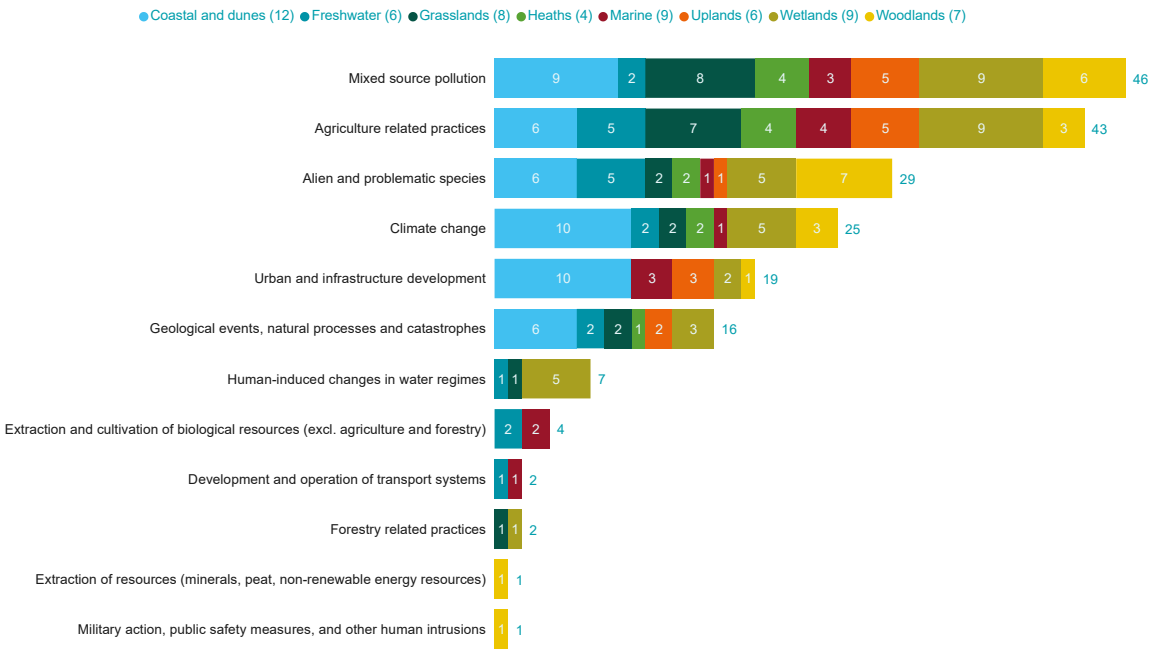


Figure 3.8 Number of habitats impacted by pressure category (High pressure ranking only). Number in legend indicates how many features are in that category across groups coastal and dunes (12), freshwater (6), grasslands (8), heaths (4), marine (9), uplands (6), wetlands (9) and woodlands (7). Download underlying data for this figure (Excel).

3.3 Conservation measures

Conservation measures were grouped into broad categories (e.g. 'Agriculture practices and agriculture-related habitats') for the purposes of analysis (see Appendix 9 of the Approach Document). Where multiple individual conservation measures were reported under the same broad category for a given species or habitat, they were counted as a single occurrence of that conservation measure category in the analysis, rather than as multiple distinct conservation measures.

The figures presented here indicate where measures have been reported as being in place or required, but they do not assess how effective or sufficient those measures are in achieving Favourable Conservation Status. Details on the scope, implementation, and impact of measures are provided in the evidence for each feature within the technical appendices, which give the fuller context needed to evaluate outcomes and future needs.

Key findings for conservation measures of species

Conservation measures related to agriculture practices and agriculture-related habitats was the most commonly reported measures category for species. When both high and medium-ranked measures were considered (Figure 3.9), they were listed for 43 of the 53 species assessed. Even when focusing only on high-ranked

measures (Figure 3.10), agriculture remained the most numerous conservation measure, having being listed for 30 species.

Measures related to forestry practices and infrastructure were also listed for a large number of species, affecting 32 and 29 species respectively when high and medium-ranked measures were combined (Figure 3.9). These remained prominent even when considering only high-ranked measures (Figure 3.10), with forestry listed for 17 species and infrastructure for 18.

The influence of specific species groups is evident in these results. Bats, which make up the largest species group assessed (15 species), contributed substantially to the top three high-ranked conservation measure groups. Thirteen bat species had agriculture-related measures listed, eleven had measures related to the development and operation of transport systems, eleven had forestry-related measures, and ten had infrastructure-related operations and activities listed. These high numbers within a single group contribute significantly to the overall pressure totals.

Fish species also featured prominently in several key high-ranked conservation measure categories. Seven of the nine fish species had agriculture-related measures listed, while eight had measures addressing mixed source pollution and human-induced changes in hydraulic conditions.

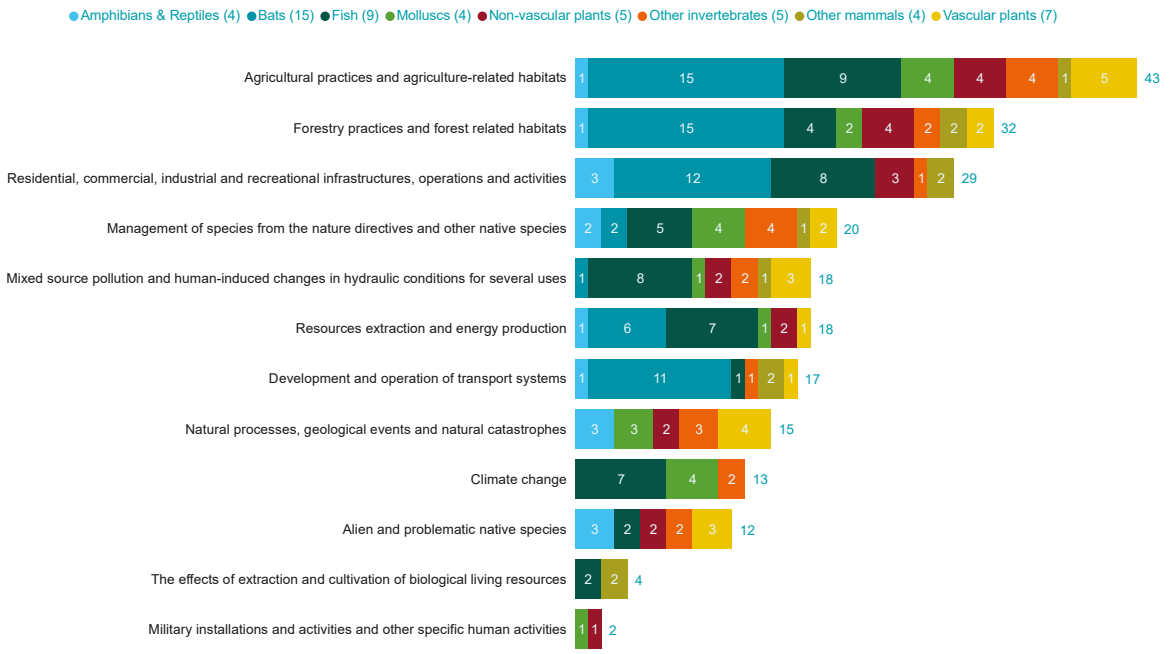


Figure 3.9 Number of species with conservation measures in place (Medium and High rankings combined). Number in legend indicates how many features are in that category across the groups of amphibians & reptiles (4), bats (15), fish (9), molluscs (4), non-vascular plants (5), other invertebrates (5), other mammals (4) and vascular plants (7). Download underlying data for this figure (Excel).

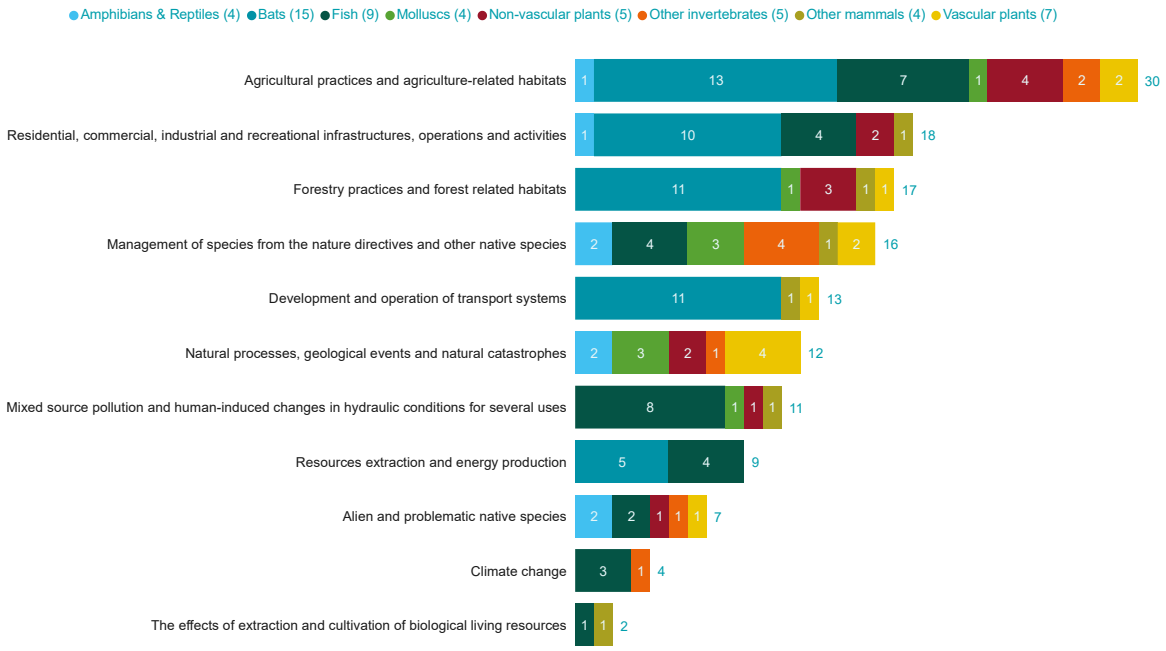


Figure 3.10 Number of species with conservation measures in place (High ranking only). Number in legend indicates how many features are in that category across the groups of amphibians & reptiles (4), bats (15), fish (9), molluscs (4), non-vascular plants (5), other invertebrates (5), other mammals (4) and vascular plants (7). Download underlying data for this figure (Excel).

Key findings for conservation measures of habitats

Conservation measures related to agriculture practices and agriculture related habitats was the most commonly reported measures category for habitats. When both high and medium-ranked measures were considered it was listed for 52 out of the 61 habitats assessed (Figure 3.11). Even when considering only high-ranked conservation measures, it remained the most common, reported for 45 habitats (Figure 3.12). This conservation measures was particularly prevalent across all habitat types: coastal and dunes (6/12), freshwater (5/6), grassland (7/8), heath (4/4), marine (5/9), uplands (6/6), wetland habitats (9/9), as well 3 out of 7 woodland habitats (Figure 3.12).

Mixed source pollution and human-induced changes in hydraulic conditions for several uses were also a major conservation measure group, reported for 48 habitats when high and medium-ranked measures were combined (Figure 3.11), and 36 habitats at a high-ranked measures level (Figure 3.12). High-ranked mixed source pollution measures were reported for all heath (4/4) and the majority of marine habitats (7/9), wetlands (8/9), uplands (4/6), coastal and dunes (8/12) and freshwater habitats (5/6) (Figure 3.12).

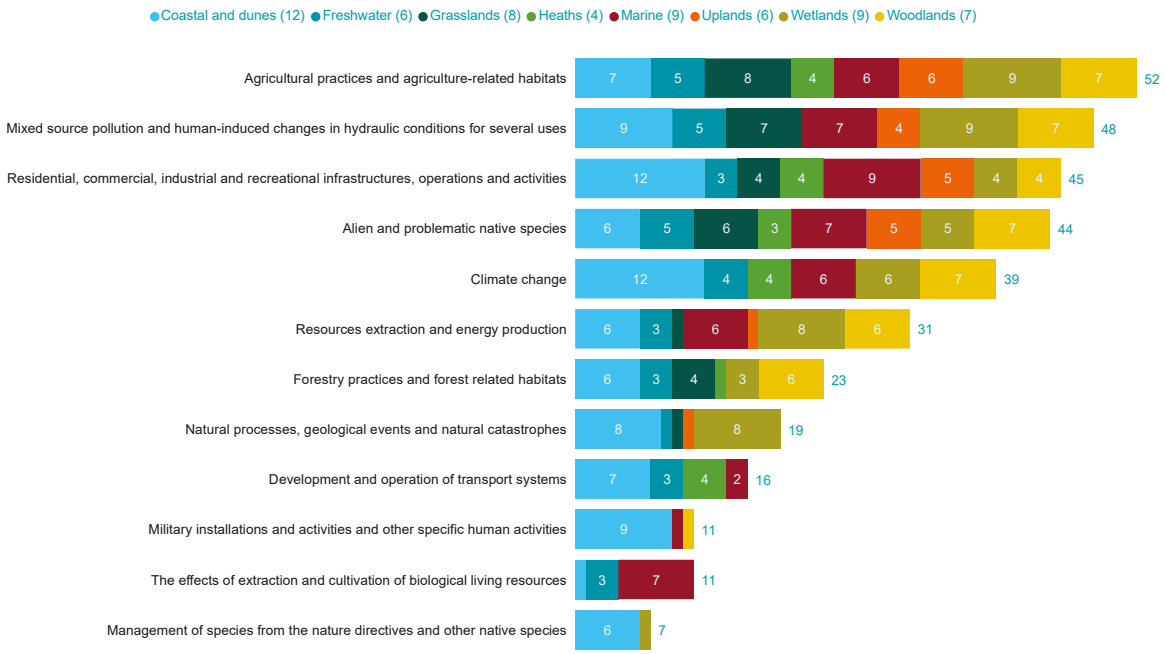


Figure 3.11 Number of habitats with conservation measures in place (Medium and High rankings combined). Number in legend indicates how many features are in that category across groups coastal and dunes (12), freshwater (6), grasslands (8), heaths (4), marine (9), uplands (6), wetlands (9) and woodlands (7). Download underlying data for this figure (Excel).

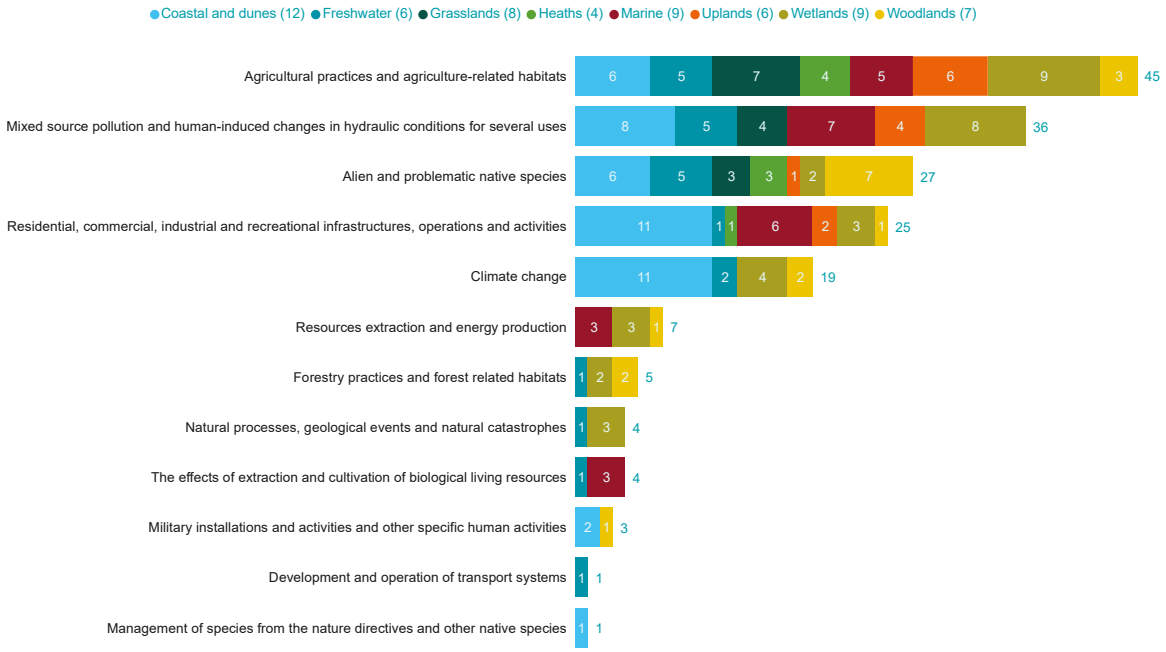


Figure 3.12 Number of habitats with conservation measures in place (High ranking only). Number in legend indicates how many features are in that category across groups coastal and dunes (12), freshwater (6), grasslands (8), heaths (4), marine (9), uplands (6), wetlands (9) and woodlands (7). Download underlying data for this figure (Excel).

4. Birds species' status and trends

The first Wales Habitats Regulation Birds Report follows the format established by the eleventh Article 12 report, which gives major emphasis to reporting on the status and trends of bird species. The method statement for all reported metrics is provided in the Approach Document. For further details see the overview section on Birds species' status and trends above.

4.1 Reporting population status

Species, sub-species and populations

We report on population status at the UK scale, a similar approach to reporting on the status and trends of each species, as was used for Article 12 in 2019, with some additions (i.e. those species considered to be probable and presumed escapees or deliberately released). All assessed bird species were identified as regularly occurring breeding and/or migratory. This report applies the Article 12 UK report approach of separately reporting on 'species populations' rather than individual species. A species population denotes a species or subspecies during the breeding season, passage or winter. The birds reporting list included 350 species populations, comprised of 241 different species or sub-species that regularly breed, passage or overwinter in the UK.

Scale of reporting

The JNCC investigated the feasibility of producing country-scale reports on status and trends for each wild bird species. A pilot was conducted using Common Snipe *Gallinago gallinago* (Martay *et al*., 2023). The Common Snipe was chosen as this species presents challenges that would likely occur with other relatively uncommon habitat specialists. The Common Snipe pilot found that even at a UK scale, it would be challenging to provide contemporary population estimates and short-term and long-term changes in distribution due to increasingly out of date data sources (Martay *et al*., 2023). These challenges would be all the more magnified at a country scale.

Population status parameters

The population status parameters for reporting are provided in Table 38 in the Approach Document. The approach was to apply the same metrics of population size, trends in abundance and changes distribution as were reported in the 11th UK Article 12 Report 2019.

4.2 Assessment of UK population estimates

Knowing the absolute number of birds in a population is important when making decisions about conservation policy and onsite conservation management, but is also of public interest. Trends over time are the most valuable resources for assessing the status of bird species for many conservation purposes. Furthermore,

knowledge of the absolute size of any species population is also needed to fully understand threats that a species may face, to evaluate the risk of extinction, and to make decisions about how to protect species. One of the most important uses of national and international population estimates to help conserve bird populations is to enable sites to be designated and hence protected on the basis that they support an important percentage of the population of a species (Ramsar Convention 2012). Absolute population estimates are also important in assessing the risk of a species becoming extinct: for example a species with a small population is more likely to be at risk of national (or global) extinction, particularly if a large proportion of the population is found on a small number of sites. Population size estimates are therefore a key conservation tool alongside population trends and other information.

The UK Article 12 report in 2019 included 293 species populations comprised of 241 different species or sub-species. The 1st Habitats Regulations reporting on birds includes 350 species populations comprising of 279 species or subspecies. This includes 18 species that are deemed to be probable and presumed escapees or deliberately released birds, such as Bar-headed Goose *Anser indicus*, Eagle Owl *Bubo bubo* and Indian Peafowl *Pavo cristatus.*

UK population estimates are provided for 343 species populations as either a minimum population size, maximum population size or a best single value. Due to data constraints there are no population estimates for Balearic Shearwater *Puffinus mauretanicus* (passage), Bar-headed Goose *Anser indicus* (breeding), Emperor Goose *Anser canagicus* (breeding), Lady Amherst's Pheasant *Chrysolophus amherstiae* (breeding), Little Auk *Alle alle* (non-breeding), Little Gull *Hydrocoloeus minutus* (non-breeding) and Ruddy Shelduck *Tadorna ferruginea* (breeding).

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet-Population status.

4.3 Assessment of population status and extinction risk

Under the EU Birds Directive, the values of each parameter are simply reported and the conservation status of the species are not assessed by each Member State. However, in the absence of reporting on Favourable Conservation Status (FCS), the UK Habitats Regulations reporting for birds is an opportunity to introduce a more objective and quantitative assessment of changes in population status of UK bird species by application of UK Birds of Conservation Concern (BoCC) and GB IUCN assessments.

Birds of Conservation Concern

The process to identify UK priority bird species is well established through the application of six-yearly BoCC assessments. The assessment of UK BoCC uses standardised criteria to allocate species to Red, Amber or Green lists depending on their level of conservation concern. The first formal assessment for UK birds was published in 1990 (Batten *et al.,* 1990), and four further assessments have since been published, mostly recently Stanbury *et al*. (2021) and Stanbury *et al*. (2024). Though, four BoCC assessments have been undertaken in Wales, analysis in changes in conservation status are reported at the UK scale, applying both BoCC5 UK (Stanbury *et al*., 2021; Stanbury *et al*. 2024) and IUCN2 GB assessments (Stanbury *et al*., 2021; Stanbury *et al*. 2024).

However, the criteria used by BoCC to assess conservation concern do not all assess conservation status in terms of the relative health of a population. Here, we present the BoCC criteria that assess changes in population abundance and distribution to the short and long term trends, rather than other criterion such as the percentage of the European population that the UK is responsible for.

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet – BoCC.

Key findings

The fifth review of BoCC in the UK assessed and assigned 245 species to updated Red, Amber and Green lists of conservation concern and suggested a continuing decline in the status of UK bird populations. On the basis of trend change in population and range for breeding and non-breeding species out of all bird species assessed by BoCC5 UK, 206 species showed no change in the UK BoCC listing's between BoCC4 and BoCC5.

A total of 23 species have negatively moved between lists, 12 species moved from Amber to Red, nine species moved from Green to Amber and two species moved straight from Green to Red (Greenfinch *Chloris chloris* and Ptarmigan *Lagopus muta*). Ptarmigan are not a breeding species of Wales. Of these 23 species only two were affiliated to non-breeding populations (Bewick's Swan/Tundra Swan *Cygnus columbianus bewickii* and Smew *Mergellus albellus*) the rest were breeding populations, broadly consisting of seabirds, farmland birds, woodland birds and upland birds. The status of 11 species has improved. Seven species moved from Red to Amber: White-tailed Eagle *Haliaeetus albicilla*, European Shag *Gulosus aristotelis*, Song Thrush *Turdus philomelos*, Redwing *Turdus iliacus*, Pied Flycatcher *Ficedula hypoleuca*, Black Redstart *Phoenicurus ochruros* and Grey Wagtail *Motacilla cinerea.* Of these species, both White-tailed Eagle and Redwing are not Welsh breeding species. Black Guillemot *Cepphus grille*, Red Grouse *Lagopus lagopus*, Mute Swan *Cygnus olor* and Common Kingfisher *Alcedo atthis* moved from the Amber to the Green list.

Eight species identified in BoCC4 UK remain as former breeders, these are: Great Bustard *Otis tarda*, Kentish Plover *Charadrius alexandrines*, Temminck's stint *Calidris temminckii*, Black Tern *Chlidonias niger*, Snowy Owl *Bubo scandiacus*, Wryneck *Jynx torquilla*, Golden Oriole *Oriolus oriolus* and European Serin *Serinus serinus*.

When assessing previous UK BoCC assessments all have shown a continuing decline in the conservation status of UK bird populations. A comparison between BoCC4 and BoCC5 supports this trend, furthermore species associated with breeding bird communities in woodland and the coastal and marine environments continue to decline.

IUCN Red-List

More recently, British birds have been assessed using the IUCN Red List criteria (Stanbury *et al*., 2017, Stanbury *et al.,* 2021, Stanbury *et al*., 2024). The IUCN GB Red List assessment process uses well-established, internationally recognised, and standardised criteria to assess extinction risk, informed by the species rarity, range

restriction and rate of decline (measured by ten years or three generations, whichever is the longer). IUCN Red List assessments for birds in Britain is not an alternative to BoCC and does not replace it.

IUCN Red List assessments are used to assess the global status of species, but can also be applied at regional, national or local scales to assess the risk of extinction at that scale. The IUCN Red List criteria apply quantitative thresholds to various combinations of population size and decline, range size and decline, and quantitative analysis of extinction risk. An additional step for regional Red List assessments evaluates whether extra-regional populations may affect the extinction risk of the regional population.

The use of the IUCN Regional Red List assessment allows the status of bird species to be compared with those of other taxa. The Red List status of bird species in the UK can also be compared with those of birds at other geographic (and global) scales. Furthermore, Red List Indices can be used to track changes in Red List status over time for groups of species. Red List Indices have been identified as indicators for several targets in the Kunming-Montreal Global Biodiversity Framework (GBF) and can be used to report biodiversity trends at national scales (Raimondo *et al.,* 2023). Due to data constraints there are no IUCN Red List assessment for Wales.

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet-IUCN change-population and Wales Birds data spreadsheet- IUCN change-species.

Key findings

For wild bird species that have been assessed for the GB IUCN Red List more than once, it is possible to examine trends between assessments in overall extinction risk. This is based on the number of species in each Red List category and the number of species moving to a higher category of extinction risk between assessments due to a genuine deterioration in their status, or to a lower category of extinction risk due to a genuine improvement in their status. Data from the second IUCN Regional Red List review of extinction risk for Great Britain assessed 243 species, making 293 species populations assessments (210 breeding, 83 non-breeding). Fifty species were assessed for both breeding and non-breeding populations (Stanbury *et al.,* 2021, Stanbury *et al*., 2024).

When accounting for species now classed as extinct, the final assessments for the 235 extant species, suggested 115 species (49%) had at least one population that was determined to be at risk of extinction (26 species Critically Endangered, 40 species Endangered and 49 species Vulnerable). On the basis that the first GB IUCN Red List assessment was undertaken only four years earlier, Stanbury *et al*. (2021; 2024) do not present an in-depth evaluation of change. However, they do pick out notable differences, such as Spotted Crake *Porzana porzana* and Leach's Storm-petrel *Oceanodroma leucorhoa* moving to Critically Endangered, from Endangered and Least Concern respectively. Ten other populations, all previously assessed as Near Threatened or of Least Concern, move to a higher threat status by at least two categories. Breeding species relevant to Wales that moved to Endangered included Northern Wheatear *Oenanthe oenanthe*, Common Chaffinch *Fringilla coelebs* and Twite *Linaria flavirostris,* while breeding Tufted Duck *Aythya fuligula*, Oystercatcher

Haematopus ostralegus, Common Kingfisher *Alcedo atthis*, Barn Swallow *Hirundo rustica* and non-breeding Bar-tailed Godwit *Limosa lapponica* move to Vulnerable. Breeding populations of Great Crested Grebe *Podiceps cristatus* and Dartford Warbler *Curruca undata* move from Vulnerable in GB IUCN1 to being of Least Concern.

It is important to note, that unlike BoCC, the IUCN process does not consider the international significance of GB populations. However, there is much commonality between the results of GB IUCN2 and UK BoCC5 assessments (Stanbury *et al.,* 2021, Stanbury *et al*., 2024). Of the total number of species to have a population qualifying as an extinction risk (Critically Endangered, Endangered, Vulnerable) through the IUCN process, all but seven are on the UK BoCC Red or Amber lists. Since the IUCN Regional Red List process focuses on extinction risk, assessments tend to identify species with extremely low numbers, restricted ranges and/or rapid recent declines; justifiably so, since these are the species most likely to become extinct.

It is widely recognised by UK ornithologists that we are extremely fortunate in the UK to have a large number of dedicated volunteers contributing data towards established bird monitoring schemes, such as Breeding Bird Survey (BBS) and the Wetland Bird Survey (WeBS). It is evidently clear that without these data, UK prioritisation and GB status assessments would not be possible. Notwithstanding the existence of these rich datasets, gaps in our knowledge do exist, for example, there is uncertainty in trend data for 20 UK breeding species including Short-eared Owl *Asio flammeus*, a scarce but regular breeding owl of upland habitats, but where populations fluctuate yearly.

4.4 Species Guild Assessments

As documented in the Approach Document it was not possible to provide individual bird species assessments. Therefore, a coordinated approach was adopted across the four UK Country Agencies and Devolved Administrations to provide species guild assessments. Three species guild assessments: breeding seabirds, breeding woodland birds and non-breeding waterbirds, were compiled due to Wales holding important UK and/or biogeographical populations. These assessments provide a summary of populations changes, conservations status, pressures and conservation measures. The assessments are presented in Bird species guild assessment technical appendix of this report.

4.5 Assessment of hunting pressure on legal quarry species

The UK legislation regulating hunting activities is heavily influenced by European legislation, in particular the Birds Directive (79/ 409/EEC, 2009/147/EC) and the Habitats Directive (92/43/ EEC). The Directives lay an obligation on EU Member States to ensure that the practice of hunting complies with the principles of wise use and balanced ecological control, so that their exploitation is compatible with maintaining the exploited species in a favourable conservation status. One of the methods to assist with this is the regular collection of data on animal abundance and on numbers of animals killed.

All wild birds in Wales have had legal protection since the Wildlife & Countryside Act was enacted in 1981. The Act transposes Article 5 of the 1979 Wild Birds Directive (2009/147/EC) which requires a system of general protection for '*all species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies*" and to "*their eggs, nests and habitats*". Schedule 2 of the 1981 Act lists a number of bird species, mainly game bird or wildfowl which may be either killed or taken outside the closed season or by authorised persons at any time.

The UK has no statutory bag recording scheme, although some voluntarily reported data and information are available from other sources. Aebischer (2019) has estimated bags for 2012/13, based on calibrating the Game and Wildlife Conservation Trust's (GWCT) National Gamebag Census against two extensive surveys of participants in sport shooting.

While estimates of UK hunting bags were provided in the UK's 11th Article 12 report on the implementation of the Birds Directive, using estimates in Aebischer (2019), a recent assessment of the sufficiency of such data for accurately estimating the scale and sustainability of the harvest of quarry species of waterbirds in the UK (Madden, Ellis and Cameron, 2025), commissioned by Defra, concluded that the information the UK has on hunting bags is "partial, limited and probably biased". On that basis, Defra reported to the African-Eurasian Migratory Waterbird Agreement (AEWA) in its December 2024 report on harvest, that "the UK is not able to submit a harvest data report for the period 2019 – 2023, as we do not now consider that an accurate estimate is available". Consequently, it is JNCC's advice to the UK's SNCBS that no reliable estimates of hunting bags can be provided for the inclusion in the 2025 reporting under regulation 9A of the Habitats Regulations and, therefore, no estimates are provided in this report.

4.6 Assessment of pressures impacting a species population

EU guidance and approach advised to report on the assessment of pressures only for those species for which SPAs have been classified (what the EU call 'SPA trigger species'). However, Wales is submitting data on Pressures for all species for which population estimates have been submitted.

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet-Pressures.

Key findings

In total, there were 274 species populations (*N*= 194 species) that regularly breed and/or over winter in Wales, representing 74% of the total number of UK species populations that were assessed. Of the 178 individual pressures identified, 73 were deemed to have a high, medium or low impact on Welsh species populations. These pressures were grouped to form 16 principal pressure categories (Figure 4.1).

Climate change was the highest pressure category impacting 124 species populations (84 breeding species and 40 non-breeding species) (Figure 4.1), representing 48% of all species populations assessed in Wales. Of the 25 seabird species populations assessed, 19 out of 21 Welsh breeding species were impacted by Climate change (91%) and 10 non-breeding species out of 21 species that

regularly winter or passage through Wales (48%). Though there are many drivers of seabird population change, species with similar trends and ecological requirements are not necessary Impacted by a common set of pressures (Burnell *et al*., 2023). Over the last two decades, research has concluded that there are both direct impacts (e.g. weather events such as heavy rainfall, strong winds) and indirect impacts (e.g. increasing sea surface temperatures influencing food availability) of climate change on seabird populations. Though in Wales, 13 of the 20 breeding seabird species have increased (Burnell *et al.,* 2023) it is unclear to what extent Welsh seabird populations will be able to alter their breeding distributions to mitigate the impacts of climate change.

Other significant pressure categories were **Agricultural related activities**, impacting 68 species populations (46 breeding species and 22 non-breeding species) and **Alien and problematic species** that impacted 46 species populations (40 breeding species and 6 non-breeding species). The impact of pressures related to agriculture are not surprising on the basis where Welsh Government's 2023 Agricultural and Horticultural survey of Wales suggested 90% of land is given over to agriculture, mostly used for rearing sheep (8.7m) and cattle (1.1m). In this survey, cereals were grown across 51,000ha, accounting for less than 3% of all agricultural land in Wales, whereas permanent grassland and rough grazing accounted for 76% of land use on Welsh agricultural holdings.

One of the clearest examples of how farmland management has affected trend change in farmland bird populations is the UK Farmland Bird Indicator between 1970-2023 (Defra, 2025), suggesting an aggregated population trend of 61% decline in 19 species of farmland birds. Here, declines were stronger for farmland specialists (e.g. Yellowhammer *Emberiza citronella*) than generalists (e.g. Blackbird *Terdus merula*). Of the 12 breeding species of wader in Wales, nine species were impacted by Agricultural related practices. These included species in severe decline such as Eurasian Curlew (*Numenius arquata*) and Common Redshank (*Tringa totanus*).

The UK seabird indicator has declined by 37% since 1986 (Defra, 2025). The population shows a steady decline between 2000 and 2013 but has since shown an accelerated sharp decline of 15% in the five-year short-term period since 2019 (see Seabird guild assessment summary).

Our assessment for Wales suggest 46 species populations, mostly consisting of breeding seabirds, non-breeding waterbirds and birds of prey were considered to be impacted now and in the future by disease (**Category: Plant and animal diseases, pathogens and pests**). Of these, 16 species populations, disease were classed as having a high impact (Figure 4.2). Disease can have significant and negative impacts on biodiversity, driving population change, through reduced productivity and survival (Daszak *et al*., 2000).

Avian Influenza (AI) has been recorded in many bird species throughout the world. The AI virus can be present in a High Pathogenicity Avian Influenza (HPAI) form which causes significant morbidity and mortality in wild birds, poultry and captive birds. An unprecedented epizootic occurred in the summer of 2022 and persisted in 2023 which had a major impact on colonial-breeding seabirds and wintering waterbirds and raptors. There is a shift in the significance of disease that has emerged since the 11th Article 12 Report.

The most recent British and Irish seabird census (Seabirds Count: 2015-2021) provided a robust benchmark for understanding population, regional and local colony level impacts of HPAI on breeding seabirds (Burnell *et al*., 2023), though due to relatively low levels of detectability such an understanding on raptor populations is unknown. Tremlett *et al*. (2025) quantified the effects of the 2022 HPAI epizootic on the populations of the UK's seabirds and highlighted significant declines in breeding numbers of Gannets *Morus bassanus*, Black-headed Gulls *Larus ridibundus*, Lesser Black-backed Gulls *Larus fuscus*, Common Terns *Sterna hirundo* and Sandwich Terns *Thalasseus sandvicensis* across Wales. Black-headed Gulls suffered the biggest decrease (-77%) of all seabird species in Wales since the Seabirds Count census in 2015-21 due to the HPAI outbreaks in Wales.

When pressure categories were evaluated with species listings on BoCC4 Wales, Climate Change was associated with 84 breeding species of which 21 species were Green listed, 28 species Amber-listed and 34 species Red-listed. For non-breeding birds of Wales, 9 Green listed species, 15 Amber listed species and 15 Red listed species were impacted by Climate Change (Figure 4.3). Similarly, Climate Change was the significant pressure for GB breeding species at risk of extinction, associated with impacting 35 species (11 Critically Endangered, 21 Endangered and 13 Vulnerable) (Figure 4.4). Though Climate Change was a key pressure on non-breeding waterbirds, the most significant pressure impacting these species populations was **Extraction and cultivation of biological living resources (other than agriculture and forestry**). A total of 52 IUCN GB listed species were associated with this pressure, including 4 Critically Endangered, 9 Endangered and 17 Vulnerable species.

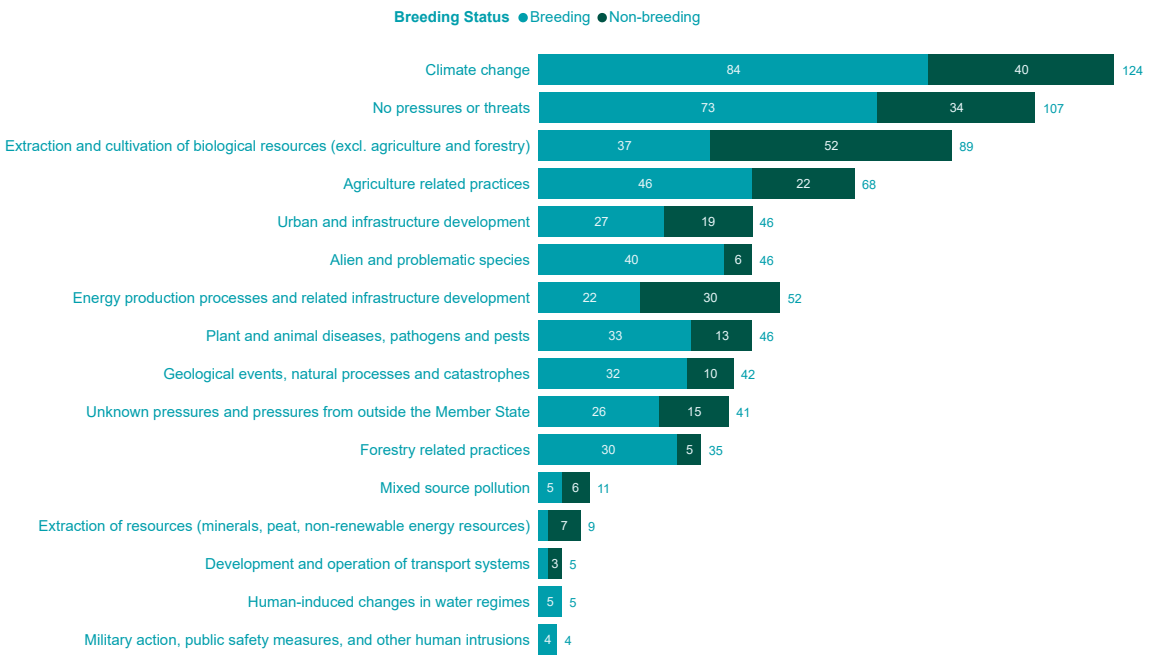


Figure 4.1. Pressure categories impacting Welsh breeding and non-breeding bird species. Download underlying data for this figure (Excel).

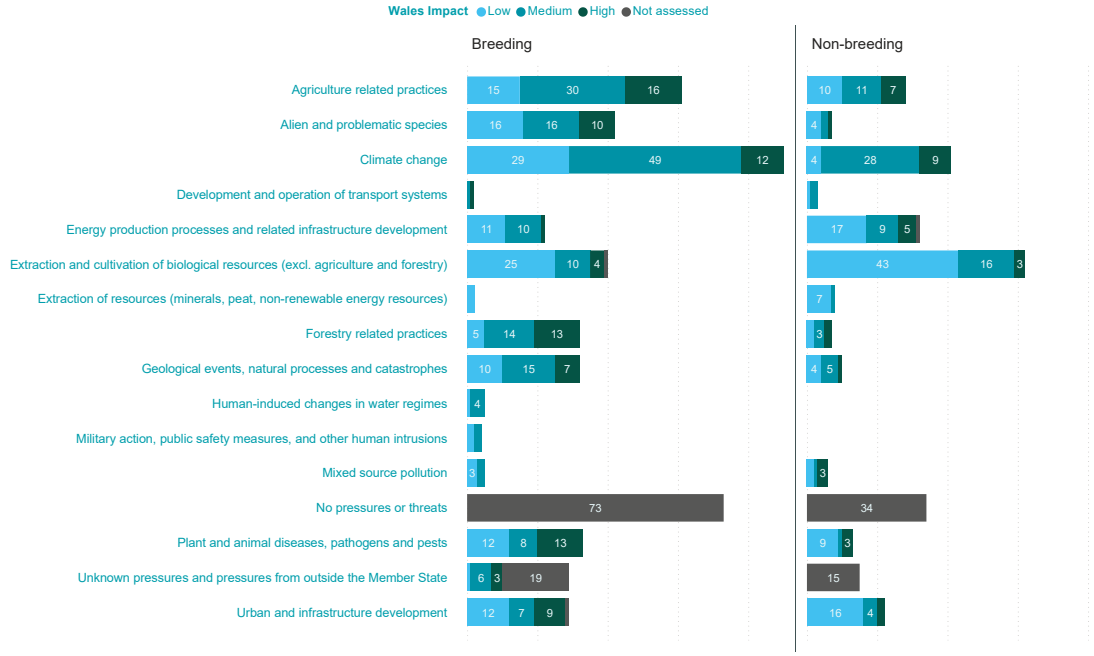


Figure 4.2. Impact of pressure categories on breeding and non-breeding birds of Wales. Download underlying data for this figure (Excel).

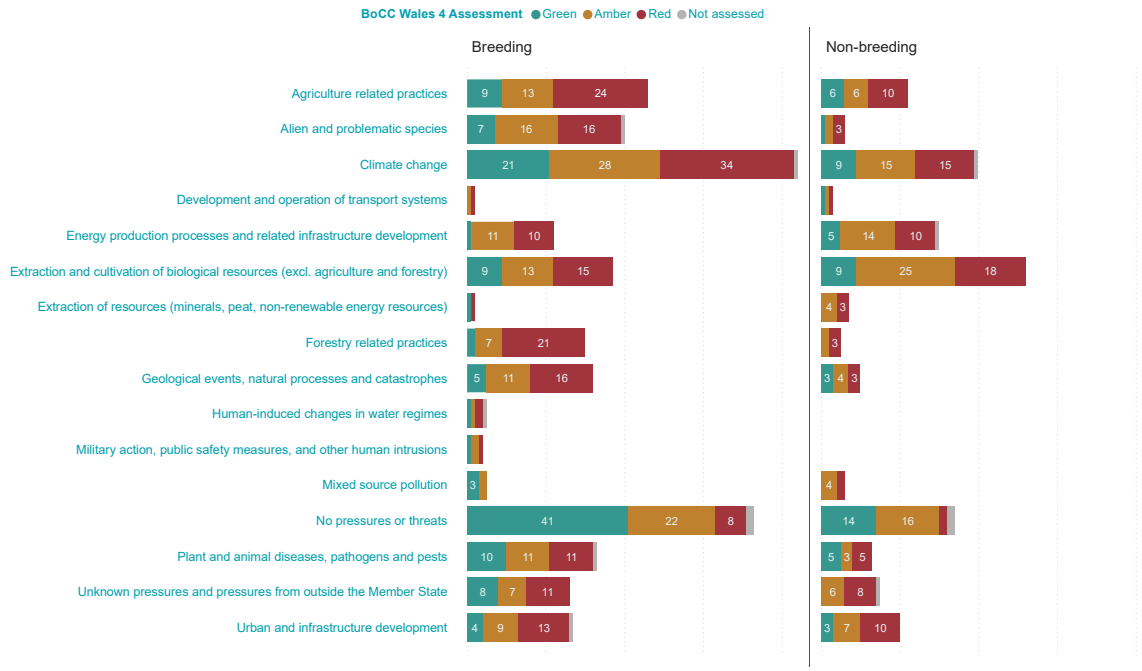


Figure 4.3. Pressure categories by BoCC4 Wales. Download underlying data for this figure (Excel).

Figure 4.4. Pressure assessment by IUCN GB Red-List. Download underlying data for this figure (Excel).

Similar to populations across the UK, birds in Wales face a wide range of pressures, with variation in the impact of those pressures. Some pressures may contribute individually or collectively to drive population change depending on species vulnerability, sensitive, exposure and ecological need. Figure 4.5a-f shows the number of species populations within six species groupings (breeding seabirds, breeding waders, breeding and non-breeding farmland birds, non-breeding waterbirds, breeding and non-breeding upland birds and breeding and non-breeding woodland birds), that are impacted by pressure categories. Climate Change is the key pressure impacting the greatest number of species populations when summed across all six species groups. Figure 4.6a-f illustrates the impact of each pressure category on the same six species groupings.

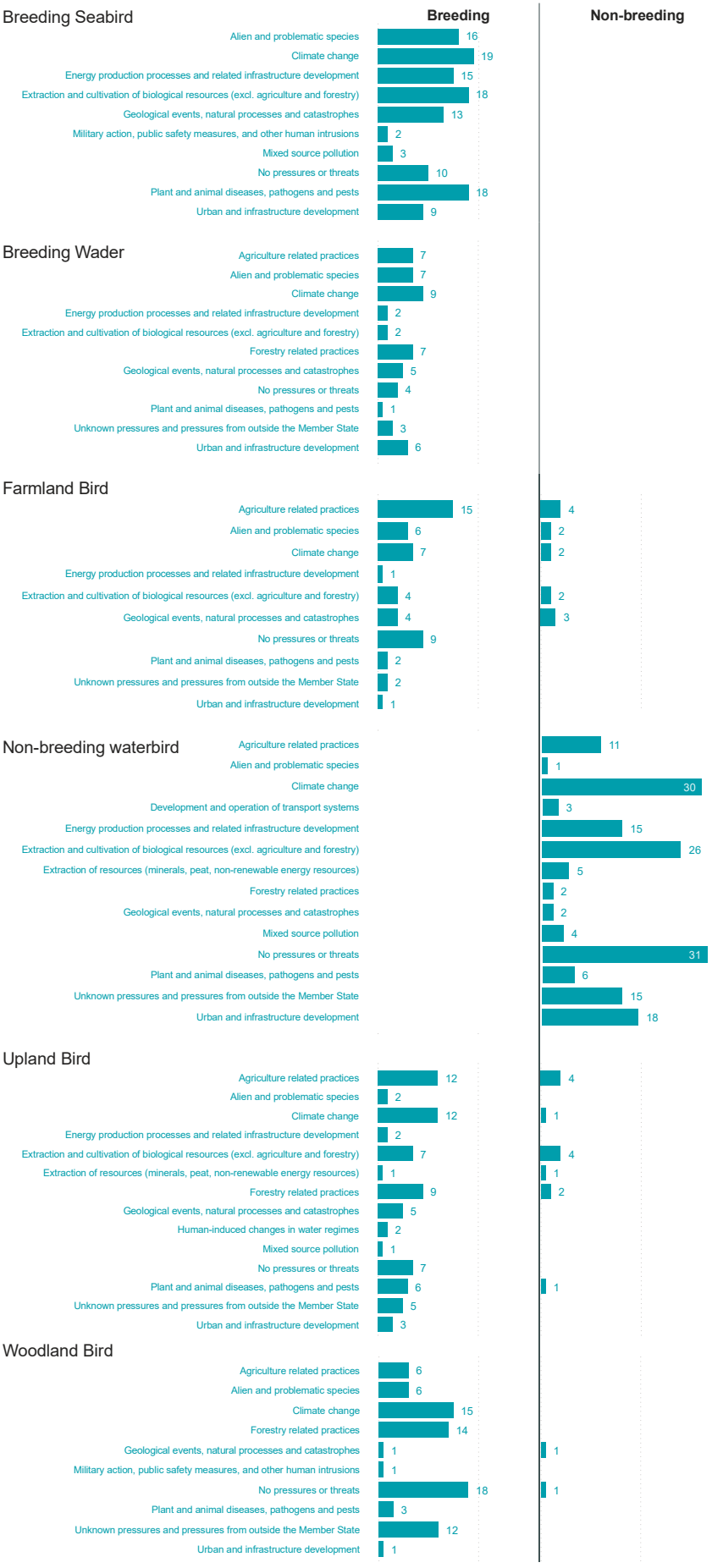


Figure 4.5 a-f. Pressure by species guild, a) breeding seabirds, b) breeding waders, c) breeding and non-breeding farmland birds, d) non-breeding waterbirds, e) breeding and non-breeding upland birds and f) breeding and non-breeding woodland birds. Download underlying data for this figure (Excel).

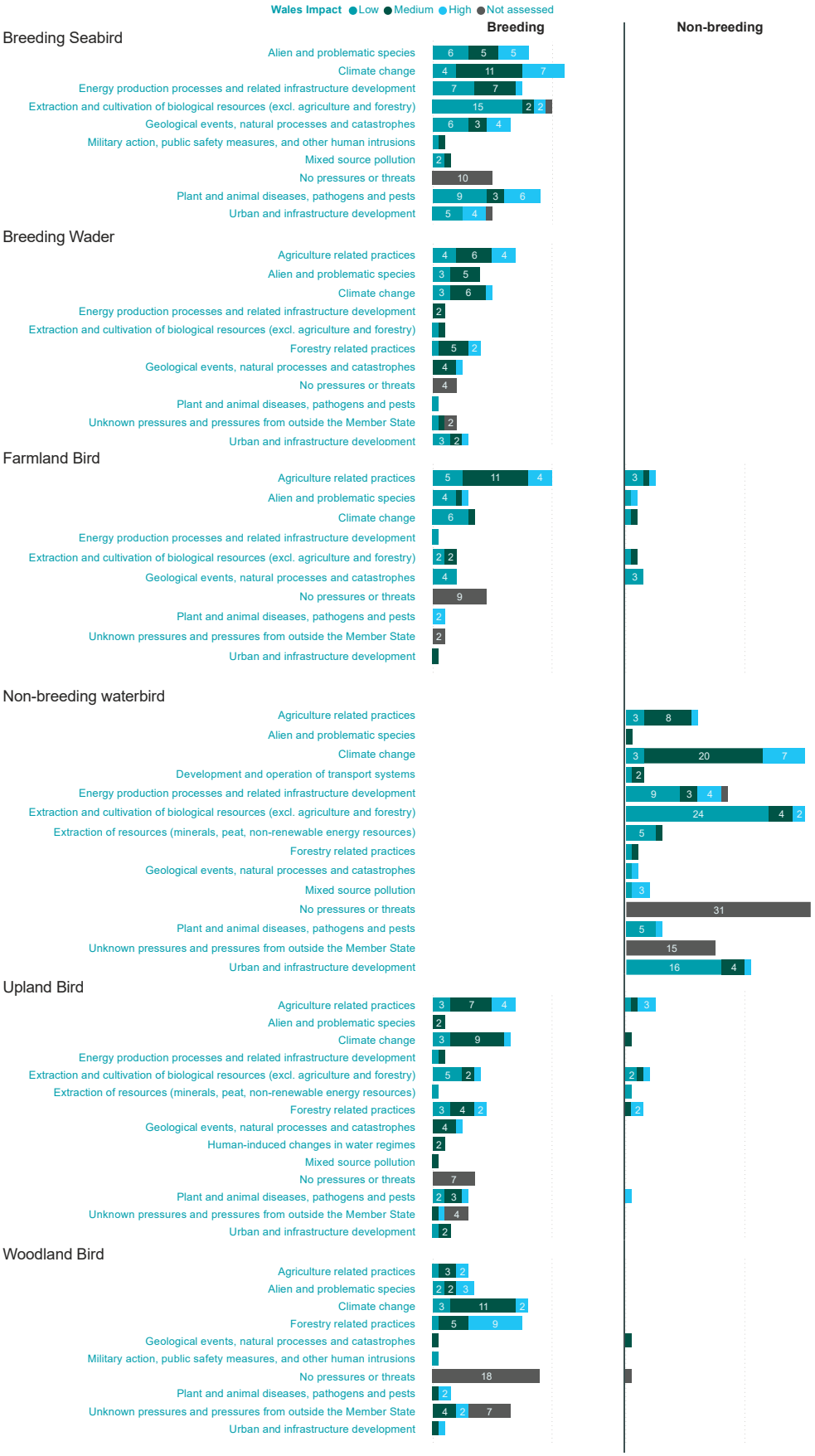


Figure 4.6 a-f. Pressure impact by species guild, a) breeding seabirds, b) breeding waders, c) breeding and non-breeding farmland birds, d) non-breeding waterbirds, e) breeding and non-breeding upland birds and f) breeding and non-breeding woodland birds. Bar colours indicate the assessed impact of pressures within Wales (high, medium, low, or not assessed). Download underlying data for this figure (Excel).

4.7 Assessment on the implementation of conservation measures

As for Pressures, conservation measures are only required to be assessed for those species for which SPAs have been classified. However, the UK is submitting data on Conservation Measures for all species for which population estimates have been submitted.

We report on implementation of conservation measures at the individual country level. This accords with guidance for Habitats Regulations reporting and allows devolved policy to be appropriately reflected. Implementation reporting will be aligned against pressure, allowing an understanding of what mechanism contributes to mitigation of a given pressures.

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet - Conservation Measures.

Key findings

A total of 13 conservation measures were associated with those species populations where a pressure had been identified. There were a small number of species that do not require conservation measures, these are predominantly non-native species and those species where there are no identified pressures. Conservation measures related to infrastructure, operations and activities was the most numerous reported category for species populations (59 measures for breeding birds and 63 measures for non-breeding birds). Measures related to agriculture was the second highest measure category, affecting 72 species populations (60 breeding species, 12 non-breeding species) (Figure 4.7). Though Climate Change was the highest ranking pressure impacting species populations (Figure 4.1) measures reported to mitigate this pressure were only associated to 12 species populations (3 breeding species, 9 non-breeding species).

When assessed, 208 species populations required a conservation measure to mitigate an associated pressure (Figure 4.8). Out of the four assessment categories, the highest ranking was ‘Part of measures identified have been undertaken’, this accounted for 133 species populations (87 breeding species, 46 non-breeding species), representing 64% of 208 species populations. The lowest ranking categories were: ‘Measures identified, but none yet taken’ and ‘Measures needed but cannot be identified’ (Figure 4.8).

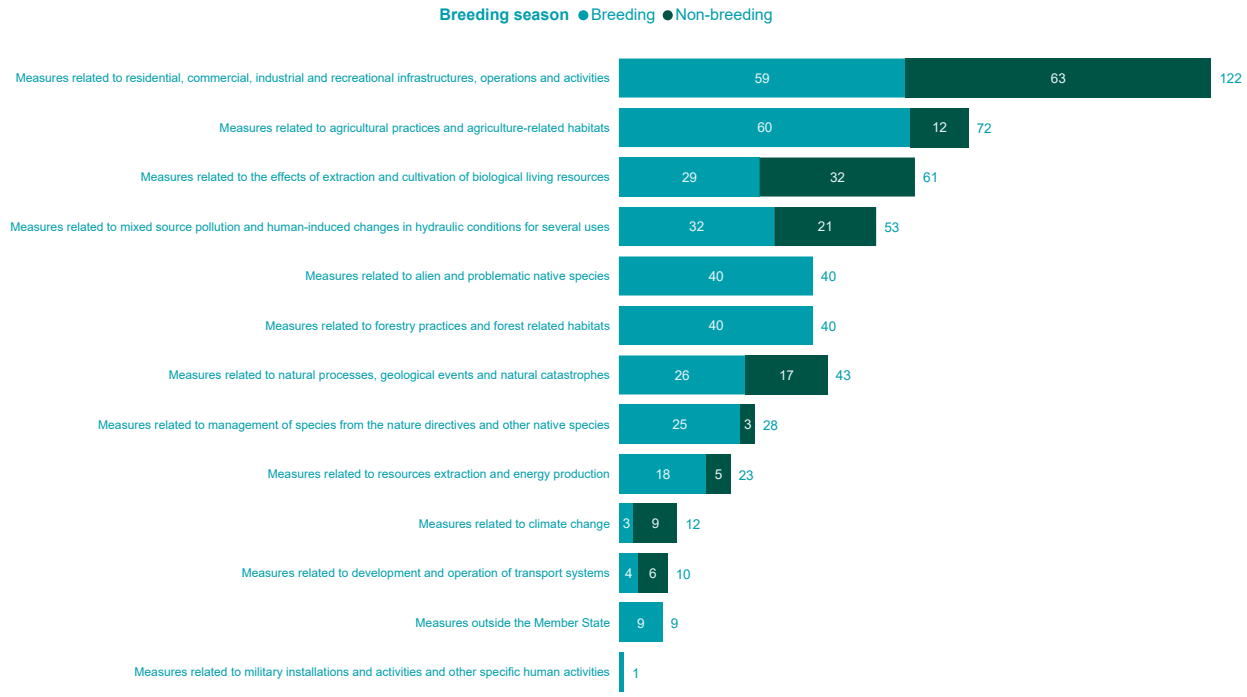


Figure 4.7. Conservation measures for breeding and non-breeding birds of Wales. Download underlying data for this figure (Excel).

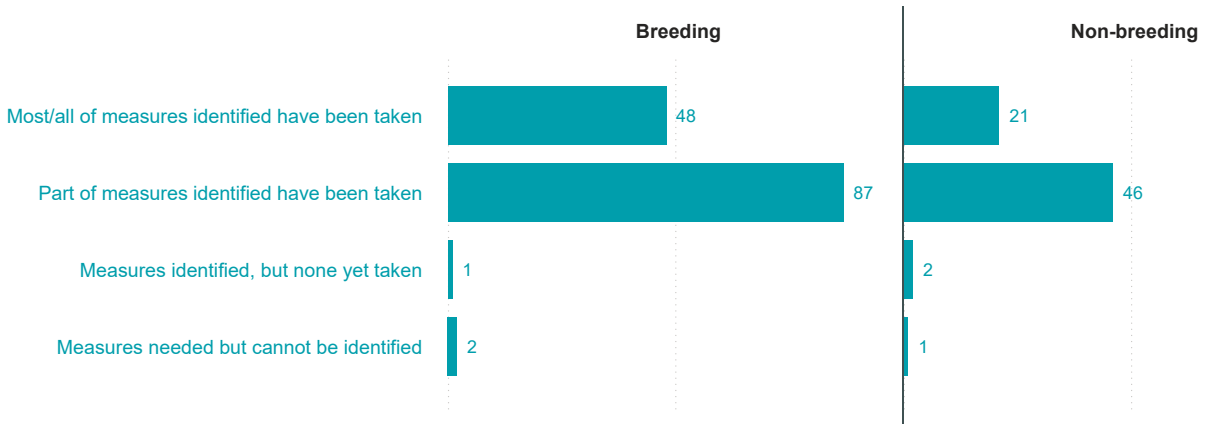


Figure 4.8. Progress on implementation of conservation measures. Download underlying data for this figure (Excel).

4.8 Proportion of British species populations that are within the UK SPA network

Statistics related to occurrence of qualifying species in the UK SPA Network have been drawn from Phase 1 of the third UK network review (Stroud *et al.*, 2016). This review collated population assessments from the 2000s, typically from the latter part of the decade (e.g. for non-breeding waterbirds, WeBS data from the five-year period 2005/06 – 2009/10 were used). Totals have been calculated for each species' SPA

suite as defined by Stroud *et al*. (2001) subject to any changes consequent on SPA classifications since 2001. Earlier Article 12 Reports requested the total population of species on national SPA Networks either whether as qualifying species, or otherwise incidentally present. As stated in the 11th UK Article 12 Report it is not feasible to derive this statistic for the UK, so what is presented is the SPA suite total (i.e. total qualifying species occurrence). The 'short-term trend of population size in the SPA network' is derived from a simple comparison of SPA suite totals in the 1990s (Stroud *et al*., 2001) and from the 2000s (Stroud *et al*., 2016). It makes no allowance for inflation of suite totals that may have occurred as a consequence of additional classifications that may have occurred since 2001.

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet - SPA proportion.

Key findings

A total of 325 UK species populations (216 species, sub-species or race) were assessed for both the proportion of the British and the biogeographical population within the UK SPA suite. Of these 196 species populations are not features of the UK SPA network, the majority of which are breeding passerines, for example, Stock Dove *Columba oenas.* Of the remaining 129 species populations, 25 populations (19.4%) had 0.1-10% representation within the UK SPA network, 30 populations (23.3%) had 11%-30% representation, 33 (25.6%) populations had 31-60% representation, 27 populations (20.9%) had 61-90% representation and 8 populations (6.2%) had greater than 90% but not 100% representation (Table 4.1). Two species (Brent Goose *Branta bernicla hrota* Svalbard and Denmark population and Fair isle Wren *Troglodytes troglodytes fridariensis*) have 100% of their GB population within the UK SPA suite (Stroud *et al*., 2016). Of the remaining species populations, four species (Great Northern Diver *Gavia immer*, Western Capercaillie *Tetrao urogallus*, Little Gull *Hydrocoloeus minutus* and Common Scoter *Malanitta nigra*) have an unknown percentage of their GB population within the SPA network.

Wales is important for several breeding birds within the UK SPA network. For example, there are seven Special Protection Areas (SPAs) classified for Chough in Wales, covering over 7,500ha. The Welsh Chough SPA suite represents 35% of the Welsh breeding population, 32% the GB breeding population and c. 77% of the UK SPA suite (Cross *et al*., 2020). Other important Welsh species that have relatively high proportions of their Welsh population within the UK SPA suite include Manx Shearwater, Northern Gannet and Common Scoter.

Table 4.1. Species populations where greater than 90% of the GB population is within the UK SPA suite (data from Stroud *et al*., 2016)

Species	Proportion of GB population in the UK SPA suite (Stroud et al., 2016)	Proportion of Biogeographical population in UK SPA suite (Stroud et al., 2016)	Feature in the Wales SPA network
Barnacle Goose (n-br, Svalbard/Denmark population)	91.2%	91.2% (Svalbard and SW Scotland)	No
Roseate Tern (br)	94%	3.8% (Europe)	Yes
Northern Gannet (br)	95.9%	54.1% (World)	Yes
Common Scoter	96%	<0.1% (W. Siberia and N. Europe)	Yes
Manx Shearwater	96.2%	78.6% (World)	Yes
Bean Goose	98%	0.9% (NE & NW Europe)	No
European Storm Petrel	99%	5.35 (NE Atlantic)	Yes
Leach's Storm Petrel	99.2%	21% (NE Atlantic)	No
Brent Goose (n-br, Svalbard & Denmark population)	100%	46.7% (Svalbard & Denmark)	No
Fair Isle Wren	100%	100% (World)	No

4.9 Wales proportion of a UK species population

None of Wales' wild bird species are endemic but some are part of populations with UK importance, and in some cases represent important biogeographical and/or world distributions for both numbers and range. Being able to determine a species' national importance or 'responsibility' is vital for monitoring and understanding drivers of population change, trend changes and conservation interventions that may have implications for the maintenance of UK populations. The assessment of UK importance relies on standardised data collection and reliable data on population estimates from the UK and Wales.

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet - Population status.

Key findings

Using available data sources, it was possible to provide an indicative Welsh proportion for 274 species populations of their estimated UK populations. For 52 species of non-breeding waterbirds, due to data collection differences, the importance of a Welsh population was determined from the Great British population.

Wales support large proportions of either the UK or British population (more than 30%) for 12 species populations (Table 4.2). More than 80% of the Uks' Pied Flycatcher *Ficedula hypoleuca* and Wood Warbler *Phylloscopus sibilatrix* populations are suggested to be found in Wales and their declines in Wales mirror those seen across the rest of the UK. Any negative change in the Welsh conservation status of these species has direct implications for UK populations and range maintenance. For other woodland bird species such as Common Redstart *Phoenicurus phoenicurus,* Northern Goshawk *Accipiter gentilis,* and Spotted Flycatcher, whilst the Welsh proportion of their UK population is smaller, at 46%, 33% and 32% respectively, management actions may still have an important influence on overall UK population status.

Other species where Wales holds a significant proportion of the UK population are both breeding and non-breeding Red-billed Chough (c.79% of the UK population is found in Wales, see Hayhow *et al*., 2018) and Manx Shearwater (Wales accounts for 61% of the UK population, and 39% of the global population, see Burnell *et al.,* 2023).

Of all non-breeding waterbirds found in Wales only Light-bellied Brent Goose *Branta bernicla hrota*, (Svalbard/Denmark race) had greater than 30% of the British population found in Wales (Table 4.2). Three species of non-breeding waterbird, that winter in Wales, had greater than 20% but less than 30% of the British population: Common Greenshank *Tringa nebularia*, Eurasian Oystercatcher *Haematopus ostralegus* and Spotted Redshank *Tringa erythropus.*

Table 4.2. Wales' bird species populations that account for 30% or greater of the UK or GB population.

Species population	Wales population estimate	UK population estimate	Wales population proportion of the UK population
Garden Warbler (br)	39,500 (pairs)	125,224 (pairs)	31.5%
Spotted Flycatcher (br)	5,700 (pairs)	17,824 (pairs)	31.9%
Northern Goshawk (br)	310 (pairs)	954 (pairs)	32.5%
Red Kite (br)	2,117 (pairs)	6,350 (pairs)	33.3%
Common Redstart	50,500 (pairs)	110,504 (pairs)	45.7%
Great Cormorant (*carbo.carbo*) (n-br)	2,894 (individuals)	5,041 (individuals)	57.4%
Manx Shearwater (br)	480,627 (AOS)	786,743 (AOS)	61.1%
Brent Goose (*Branta bernicla hrota*) (n-br)	1,645 (individuals)	2,389 (individuals)	68.9%
Red-billed Chough (br)	236 (pairs)	300 (pairs)	78.7%
Little Egret (br)	1,273 (pairs)	1,496 (pairs)	85.1%
European Pied Flycatcher (br)	15,000 (pairs)	17,227 (pairs) UK max. population size	87.1%
Wood Warbler (br)	2,850 (pairs)	3,302 (pairs)	93.2%

4.10 UK Species Action Plans, strategies, working groups etc

Reporting on Species Action Plans (SAPs), Strategies and Working Groups is a new feature included in the 2025 UK country bird reports. SAPs, Strategies and Working Groups are listed for each UK species/population for which a Plan, Strategy or Working Group exists, with details of co-ordinated measures on birds provided. Some UK SAPs, only operate within one of the four UK countries, for example, the Curlew Recovery Plan for Wales.

For clarity, SAPs, Strategies or Working Groups which had a broad remit but do not specify individual species, were not included. The information provided for each

SAPs, Strategies or Working Groups identifies conservation measures that can support the recovery of individual species/populations.

The method statement is found in the Approach Document and the workings are in the Technical Appendix Wales Birds data spreadsheet - Species Action plans.

Key findings

In total, 73 species populations relevant to Wales are affiliated to a SAP, strategy or Working Group (Table 4.3). UK-signed international agreements account for 90 species populations, notably breeding and wintering seabirds and non-breeding waterbirds predominantly though commitments to OSPAR Regional Action Plan for marine birds in the North-east Atlantic (2024-2030) and AEWA.

Welsh Government are developing a Welsh Seabird Conservation Strategy that will produce up-to date vulnerability assessments for 48 seabird species populations (breeding, non-breeding and passage) of 30 species, including non-breeding seaducks such as Red-throated Diver *Gavia stellata* and Common Scoter *Melanitta nigra*. In addition, the strategy will identify the most important pressures for each species and determine the extent of commonality of pressures/issues across species assessments. The only wild bird recovery plan in Wales is for breeding Curlew. This plan presents a framework that sets the strategic direction to conserve breeding Curlew over a ten-year programme of action (2021-2031). The framework for action has been developed by the partnership Gylfinir Cymru / Curlew Wales to internationally agreed standards and is designed to align actions for recovery with the AEWA International Species Action Plan for Curlew. Other single species working groups include: the multi-partner Wales Chough Forum that applies evidence to aid Chough recovery in Wales; the Wales Greenland White-fronted Goose Working Group and the England and Wales White-tailed Eagle Working Group.

The UK woodland Birds Steering Group is a joint group between organisations that represent the four country Statutory Nature Conservation Bodies (SNCBs), conservation, and academia. The Steering Group has applied evidence and expert opinion to develop a framework to aid recovery for nine woodland bird species at risk of extinction. This species suite includes three woodland birds (Wood Warbler, Pied Flycatcher and Hawfinch) where Wales holds >50% of the UK population.

Table 4.3. Welsh species populations affiliated with a UK signed international Species Action Plan, UK/Wales Action Plan, Strategy or Working Group.

UK-signed international SAP / Strategy / Working Group	**Number of species**	**Species names**
International Single Species Action Plan for the Conservation of the Greenland White-fronted Goose *Anser albifrons flavirostris* 2012-2022. AEWA. 2012. Greenland White-fronted Goose Study (GWGS).	1	Greenland White-fronted Goose *Anser albifrons flavirostris* (n-br)
A conservation framework for Hen Harriers in the United Kingdom. 2011. JNCC.	1	Hen Harrier *Circus cyaneus* (br and n-br)
AEWA European Goose Management Platform.	1	Greylag Goose *Anser anser* (n-br)
AEWA European Goose Management Platform. International Single Species Management Plan for the Barnacle Goose (Russia/Germany & Netherlands Population East Greenland/Scotland & Ireland Population Svalbard/South-west Scotland Population). 2018. AEWA.	1	Barnacle Goose *Branta leucopsis* (n-br)
AEWA European Goose Management Platform. International Species Management Plan for the Svalbard Population of the Pink-footed Goose (TS No. 48). 2012. AEWA.	1	Pink-footed Goose *Anser brachyrhynchus* (n-br)
AEWA International Working Group for Black-tailed Godwit.	1	Black-tailed Godwit *Limosa limosa* (n-br)
AEWA International Working Group for Black-tailed Godwit. International Single Species Action Plan for the Conservation of Black-tailed Godwit *Limosa l. limosa* & *L. l. islandica*. 2008. AEWA.	1	Black-tailed Godwit *Limosa limosa islandica* (n-br)
AEWA International Working Group for Black-tailed Godwit. International Single Species Action Plan for the Conservation of Black-tailed Godwit *Limosa l. limosa* & *L. l. islandica*. AEWA. 2008. International Multi-Species Action Plan for the Conservation of Breeding Waders in Wet Grassland Habitats in Europe (2018-2028). Naturschutzbund Deutschland (NABU). 2018.	1	Black-tailed Godwit *Limosa limosa limosa* (n-br)
EU Management Plan Greater Scaup 2009-2011. EU.	1	Greater Scaup *Aythya marila* (n-br)
EU Management Plan Northern Pintail 2007-2009. EU.	1	Northern Pintail *Anas acuta* (n-br)
European Union Management Plan 2009-2011 Golden Plover. EU. 2009.	1	Eurasian Golden Plover *Pluvialis apricaria* (br and n-br)
International (East Atlantic) Species Action Plan for the Conservation of the roseate tern *Sterna dougallii* (2021-2030). Developed under the framework of the Roseate Tern LIFE Project (LIFE14 NAT/UK/000394). European Commission 2021. OSPAR Regional Action Plan for marine birds in the North-east Atlantic (2024-2030). 2024. OSPAR. Irish Sea Tern Network.	1	Roseate Tern *Sterna dougallii* (br)
International Multi-Species Action Plan for the Conservation of Breeding Waders in Wet Grassland Habitats in Europe (2018-2028). Naturschutzbund Deutschland (NABU). 2018.	6	Common Redshank *Tringa totanus*, Common Snipe *Gallinago gallinago*, Dunlin *Calidris alpina schinzii*, Eurasian Oystercatcher *Haematopus ostralegus*, Northern Lapwing *Vanellus vanellus* (all br)

UK-signed international SAP / Strategy / Working Group	Number of species	Species names
International Single Species Action Plan for the Conservation of the Common Eider (Baltic, North & Celtic Seas Population Norway & Russia Population Svalbard & Franz Josef Land Population) – (TS No. 75). 2022. AEWA.	1	Common Eider *Somateria mollissima* (br)
International Single Species Action Plan for the Conservation of the Corncrake. 2006. CMS & AEWA.	1	Corncrake *Crex crex* (former breeder)
International Single Species Action Plan for the Conservation of the Eurasian Curlew. 2015. AEWA. AEWA International Working Group for Eurasian Curlew. International Multi-Species Action Plan for the Conservation of Breeding Waders in Wet Grassland Habitats in Europe (2018-2028). Naturschutzbund Deutschland (NABU). 2018. UK Species Action Plan – In development (2025). UK Curlew LIFE Steering Group. 2020-2024.	1	Eurasian Curlew *Numenius arquata* (br and n-br)
UK Curlew Species Action Plan – In development	1	Eurasian Curlew *Numenius arquata* (br)
A Wales Action Plan for the Recovery of Curlew. 2021. Gylfinir Cymru / Curlew Wales.	1	Eurasian Curlew *Numenius arquata arquata* (br)
International Single Species Action Plan for the Conservation of the Eurasian Spoonbill (complete) (TS No.35) 2008. AEWA.	1	Eurasian Spoonbill *Platalea leucorodia* (n-br)
International single species action plan for the conservation of the European turtle-dove (2018 to 2028). 2018. European Commission: Directorate-General for Environment.	1	European Turtle-dove *Streptopelia turtur* (former breeder)
International Single Species Action Plan for the Conservation of the Light-bellied Brent Goose (East Canadian High Arctic population) *Branta bernicla hrota.* 2006. AEWA.	1	Brent Goose *Branta bernicla hrota* (n-br)
International Single Species Action Plan for the Conservation of the Long-tailed Duck 2016–2025. AEWA European Seaduck International Working Group. OSPAR Regional Action Plan for marine birds in the North-east Atlantic (2024-2030). 2024. OSPAR.	1	Long-tailed Duck *Clangula hyemalis* (n-br)
International Single Species Action Plan for the Conservation of the Northwest European Population of the Bewick‘s Swan (TS no. 44). 2012. AEWA.	1	Tundra Swan *Cygnus columbianus bewickii* (n-br)
International Single Species Action Plan for the Conservation of the Taiga Bean Goose (*Anser fabalis fabalis*). 2015. AEWA. Taiga Bean Goose Task Force (AEWA).	1	Bean Goose *Anser fabalis fabalis* (n-br)

UK-signed international SAP / Strategy / Working Group	Number of species	Species names
International Single Species Action Plan for the Conservation of the Velvet Scoter (Western Siberia & Northern Europe/NW Europe population). 2018. AEWA. EU Management Plan Velvet Scoter 2007-2009. EU. AEWA European Seaduck International Working Group. OSPAR Regional Action Plan for marine birds in the North-east Atlantic (2024-2030). 2024. OSPAR.	1	Velvet Scoter *Melanitta fusca* (n-br)
OSPAR Regional Action Plan for marine birds in the North-east Atlantic (2024-2030). 2024. OSPAR.	29	Atlantic Puffin (*Fratercula arctica*), Balearic Shearwater (*Puffinus mauretanicus*), Black Guillemot (*Cepphus grylle*), Black-headed Gull (*Larus ridibundus*), Black-legged Kittiwake (*Rissa tridactyla*), Black-throated Diver (*Gavia arctica*), Common Guillemot (*Uria aalge* all others), Common Scoter (*Melanitta nigra* s. str.), European Shag (*Phalacrocorax aristotelis aristotelis*), European Storm-petrel (*Hydrobates pelagicus*), Fulmar (*Fulmarus glacialis*), Great Black-backed Gull (*Larus marinus*), Great Cormorant (*Phalacrocorax carbo carbo*), Great Cormorant (*Phalacrocorax carbo sinensis*), Great Northern Diver (*Gavia immer*), Great Skua (*Catharacta skua*), Herring Gull (*Larus argentatus argenteus*), Leach's Storm-petrel (*Hydrobates leucorhous*), Lesser Black-backed Gull (*Larus fuscus* all others), Little Gull (*Hydrocoloeus minutus*), Manx Shearwater (*Puffinus puffinus*), Mediterranean Gull (*Larus melanocephalus*), Mew Gull (*Larus canus*), Northern Gannet (*Morus bassanus*), Parasitic Jaeger (*Stercorarius parasiticus*), Razorbill (*Alca torda*), Red-throated Diver (*Gavia stellata*), Sandwich Tern (*Thalasseus sandvicensis*), Yellow-legged Gull (*Larus michahellis*) (All n-br populations)
OSPAR Regional Action Plan for marine birds in the North-east Atlantic (2024-2030). 2024. OSPAR. International Single Species Action Plan for the Conservation of the Common Eider (Baltic, North & Celtic Seas Population Norway & Russia Population Svalbard & Franz Josef Land Population) – (TS No. 75). 2022. AEWA.	1	Common Eider *Somateria mollissima* (n-br)
OSPAR Regional Action Plan for marine birds in the North-east Atlantic (2024-2030). 2024. OSPAR. Irish Sea Tern Network.	3	Arctic Tern *Sterna paradisaea*, Common Tern *Sterna hirundo*, Little Tern *Sternula albifrons* (All br)

UK-signed international SAP / Strategy / Working Group	Number of species	Species names
Plan for the Recovery and Conservation of Ospreys in Europe and the Mediterranean Region in Particular. 2016. Convention on the Conservation of European Wildlife and Natural Habitats.	1	Osprey *Pandion haliaetus* (br)
Ring Ouzel Study Group https://www.ringouzel.info/index.html	1	Ring Ouzel *Turdus torquatus* (br)
Species Action Plan for the Red Kite in the European Union. 2010.	1	Red Kite *Milvus milvus* (br and n-br)
UK Inter-Agency Chough Working Group	1	Red-billed Chough *Pyrrhocorax pyrrhocorax* (br and n-br)
UK Woodland Bird Steering Group	8	Eurasian Woodcock *Scolopax rusticola*, European Pied Flycatcher *Ficedula hypoleuca*, Hawfinch *Coccothraustes coccothraustes*, Marsh Tit *Poecile palustris*, Spotted Flycatcher *Muscicapa striata*, Willow Tit *Poecile montanus*, Wood Warbler *Phylloscopus sibilatrix* (All br)
UK Woodland Bird Steering Group. Woodpecker Network. https://www.woodpecker-network.org.uk/index.php	1	Lesser Spotted Woodpecker *Dryobates minor* (br)
Woodpecker Network. https://www.woodpecker-network.org.uk/index.php	2	Eurasian Green Woodpecker *Picus viridis*, Great Spotted Woodpecker *Dendrocopos major* (all others) (br)
England and Wales White-tailed Eagle Working Group	1	White-tailed Eagle *Haliaeetus albicilla*
Wales Chough Forum	1	Red-billed Chough *Pyrrhocorax pyrrhocorax* (br and n-br)
Wales Greenland White-fronted Goose Working Group	1	Greenland White-fronted Goose *Anser albifrons flavirostris* (n-br)

UK-signed international SAP / Strategy / Working Group	Number of species	Species names
Draft Welsh Seabird Conservation Strategy. 2024. Welsh Government.	30	Arctic Tern *Sterna paradisaea*, Atlantic Puffin *Fratercula arctica*, Balearic Shearwater *Puffinus mauretanicus*, Black Guillemot *Cepphus grylle*, Black-headed Gull *Larus ridibundus*, Black-legged Kittiwake *Rissa tridactyla*), Common Eider *Somateria mollissima*, Common Guillemot *Uria aalge* (all others), Common Scoter *Melanitta nigra* s. str., Common Shelduck *Tadorna tadorna*, Common Tern *Sterna hirundo*, European Shag *Phalacrocorax aristotelis aristotelis*, European Storm-petrel *Hydrobates pelagicus*, Fulmar *Fulmarus glacialis*, Great Black-backed Gull *Larus marinus*, Great Cormorant *Phalacrocorax carbo carbo*, Great Cormorant *Phalacrocorax carbo sinensis*, Great Northern Diver *Gavia immer*, Herring Gull *Larus argentatus argenteus*, Lesser Black-backed Gull *Larus fuscus* (all others), Little Gull *Hydrocoloeus minutus*, Little Tern *Sternula albifrons*, Manx Shearwater *Puffinus puffinus*, Mediterranean Gull *Larus melanocephalus*, Northern Gannet *Morus bassanus*, Razorbill *Alca torda*, Red-breasted Merganser *Mergus serrator*, Red-throated Diver *Gavia stellata*, Roseate Tern *Sterna dougallii*, Sandwich Tern T*halasseus sandvicensis*

4.11 References

Batten, L. A., Bibby, C. J., Clement, P., Elliott, G. D., & Porter, R. F. 1990. *Red Data Birds in Britain*. Poyser, London.

Burnell, D., Perkins, A. J., Newton, S. F., Bolton, M., Tierney, T. D., & Dunn, T. E. 2023. *Seabirds Count: a census of breeding seabirds in Britain and Ireland (2015–2021).* Lynx Edicions, Barcelona.

Cross, A.V., Stratford, A., Johnstone, I., Thorpe, R.I.T., Dodd, S., Peach, W., Buchanan, G. and Moorhouse-Gann, R. 2020. Red-billed Chough Wales research programme. Natural Resources Wales Science Report Series (Unpubl. Report).

Daszak, P., Cunningham, A.A. and Hyatt, A.D. 2000. Emerging infectious diseases of wildlife: threats to biodiversity and human health. Science 21, 443-449.

Defra. 2025. Wild bird populations in the UK and in England: Annual trends in wild bird populations in the UK.

Hayhow, D.B., Johnstone, I., Moore, A.S, Mucklow, C., Stratford, A., Šúr, M. and Eaton, M.A. 2018. Breeding status of Red-billed Choughs *Pyrrhocorax pyrrhocorax* in the UK and Isle of Man in 2014, Bird Study, 65:4, 458-470.

JNCC, DAERA, NatureScot, NE, NRW (2026). The Approach to Assessing Conservation Status of Habitats and Species for the 2019–2024 Habitats Regulations Country Reporting. Joint Nature Conservation Committee, Peterborough. Available to download from: https://jncc.gov.uk/our-work/habitats-regulations-reporting-2019-to-2024/

Madden, J.R., Ellis, M. and Cameron, T. 2025. An Assessment of Sufficiency of Data Availability on UK Waterbird Harvests for Accurately Estimating the Scale and Sustainability of Harvest of AEWA-Listed Waterbird Populations. *JNCC Report 779 (Research and Review Report)*, JNCC, Peterborough, ISSN 0963-8091. https://hub.jncc.gov.uk/assets/5f7051a8-b7a9-4c29-813a-715160a3fbbf

Martay, B., Noble, D. and Massimino, D. 2023. The use of EU Birds Directive (Article 12) species' status and trends reports for Habitats Regulations (2019) in England & Wales, Scotland, and Northern Ireland – Pilot study: Common Snipe *Gallinago gallinago*. *JNCC Report 740*, JNCC, Peterborough, ISSN 0963-8091. https://hub.jncc.gov.uk/assets/b14e80a6-0aa8-4724-a44f-71e5b671e14f

Raimondo, D., Young, B.E., Brooks, T.M. *et al*. 2023. Using Red List indices to monitor extinction risk at national scales. Conservation Science and Practice. 5:1.

Ramsar Convention 2012. *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance of the Convention on Wetlands (Ramsar, Iran, 1971).* 131 pp.

Stanbury, A., *et al*. 2017. The risk of extinction for birds in Great Britain. *Brit. Birds* 110: 502–517.

Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. 2021. The Status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of man and second IUCN assessment of extinction risk for Great Britain. British Birds 114: 723-747.

Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. 2024. The Status of the UK's breeding seabirds: an addendum to the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 117: 471-487.

Stroud, D.A., Chambers, D., Cook, S., Buxton, N., Fraser, B., Clement, P., Lewis, I., McLean, I., Baker, H. and Whitehead, S. 2001. *The UK SPA network: its scope and content*. Volumes 1-3. JNCC, Peterborough http://jncc.defra.gov.uk/page-1418

Stroud, D.A., Bainbridge, I.P., Maddock, A., Anthony, S., Baker, H., Buxton, N., Chambers, D., Enlander, I., Hearn, R.D., Jennings, K.R, Mavor, R., Whitehead, S. and Wilson, J.D. – on behalf of the UK SPA & Ramsar Scientific Working Group (eds.) 2016. *The status of UK SPAs in the 2000s: the third network review*. 1,108 pp. JNCC, Peterborough. http://jncc.defra.gov.uk/page-7309

Tremlett, C. J., Morley, N., & Wilson, L. J. 2024. UK Seabird Colony Counts in 2023 Following the 2021/22 Outbreak of Highly Pathogenic Avian Influenza. RSPB Research Report 76. RSPB, Sandy.

4.12 Acknowledgements

The report was drafted with inputs from a Country Nature Conservation Body (CNCB) 9A Birds Reporting Advisory Group comprising Alison Giacomelli (NE); Simon Foster, Andrew Stevenson and Lucy Quinn (NatureScot); Ronan Owens (DAERA); Patrick Lindley (Natural Resources Wales); Ian Mitchell (JNCC) and Mat Parsons (JNCC). Matty Murphy (NRW) and Rebecca Laidlaw (NRW), made helpful comments on earlier drafts of the report.

The work to compile the population estimates presented In section 4.2 was undertaken by David Noble (BTO) and Iain Woodward (BTO) for commoner terrestrial breeding birds; Ilka Win, Daisy Burnell, Matt Parsons and Tim Dunn (JNCC) for breeding seabirds; Teresa Frost, Graham Austin, Stephen McAvoy & Ian Woodward (BTO) and Simon Wotton (RSPB) for non-breeding waterbirds in Great Britain; Teresa Frost & Graham Austin (BTO) and David Tierney (National Parks & Wildlife Service) for non-breeding waterbirds in the island of Ireland. We thank Mark Eaton Secretary of the Rare Breeding Birds Panel, for his tireless and meticulous work collating the national archive of data and information on the UK's rarest birds. Without his (and his predecessors) enormous efforts over decades our knowledge of the populations of these species would be scant.

The BTO generously made available maps and derived statistics from the atlas of breeding and wintering birds in Britain and Ireland (Balmer *et al*. 2013). These data were used previously in the 11th report and Veronica Mendez and David Noble (BTO). Pressure, Threat and Conservation Measure assessments were made by the SNCB 9A Birds Reporting Advisory Group.

Work to compile totals for SPA suites in section 4.8 was undertaken as part of the 2008-2014 SPA Review overseen by the SPA & Ramsar Scientific Working Group (SPAR SWG) (Stroud *et al*., 2016). This has involved a major data collation exercise. Those providing data and other help for the Review are fully acknowledged by Stroud *et al*. (2016) and include many of the same individuals that are listed above.

The Review was co-ordinated by David Stroud and Ant Mattock (JNCC) and led by Ian Bainbridge (Chair of SPAR SWG).

Surveys from which the data in this report were derived were funded or organised, inter alia, by the following organisations (and their predecessor bodies): BirdWatch Ireland, BTO; DAERA; GWCT; JNCC; Natural Resources Wales; Natural England; Raptor Study Groups in Scotland, England and Wales; RSPB; Welsh Ornithological Society (WOS), Scottish Ornithologists Club (SOC); NatureScot and WWT. Finally, it is important to acknowledge that this assessment would simply not have been possible without the massive voluntary efforts of many tens of thousands of volunteers who have given their time (and resources) to participate in systematic surveys and monitoring of UK birds since the 1960s. We acknowledge their huge input and interest, without which knowledge of the UK's changing birds would be immeasurably poorer.

5. Species Reports

All distribution and range maps included in the one-page species summaries are based on 10km grid square records considered representative of the current reporting period. These maps were produced by JNCC using data provided by NRW. See introductory sections on Methodology and Data sources and resources for more details.

5.1 Amphibian & Reptile species

Image credit: Mike Hammett

S1166 Great crested newt

S1213 Common frog

S1261 Sand lizard

S6284 Natterjack toad

S1166 Great crested newt (*Triturus cristatus*)

The great crested newt (*Triturus cristatus*) in Wales is notably long-lived and experiences natural fluctuations in population . Substantial populations are found in post-industrial areas of north-east Wales, the farmed pondscape of the western Cheshire plain, and other regions with high pond density that support its metapopulation structure. Habitat suitability modelling and environmental DNA (eDNA) analysis are used to enhance understanding of range and population data. The loss of habitat connectivity and the impact of peri-urban development on metapopulations are recognised concerns. For further information on great crested newt, see the JNCC species account https://sac.jncc.gov.uk/species/S1166/.

A minimum of 331 occupied 1km squares has been recorded in Wales. This figure represents an increase from 244 in 2019, attributed to new records from development-led surveys, particularly using eDNA. However, this data does not show whether or not breeding is taking place at these sites, and without systematic repeat surveys, population loss is difficult to confirm, and thus monitoring through 1km squares is limited in assessing true trends. Monitoring data indicate declining populations in four out of five Special Areas of Conservation (SACs), with the fifth showing either stability or decline; all SACs were last assessed as unfavourable.

Key pressures include loss and fragmentation of habitat from agricultural land consolidation, urbanisation, and infrastructure development such as roads. The use of biocides in agriculture, extraction of minerals from post-industrial areas, and afforestation in open habitats also negatively affect habitat quality and availability. Natural succession in ponds, pollution from surrounding land, and invasive species including fish and pathogens like *Batrachochytrium salamandrivorans* (Bsal) pose additional threats.

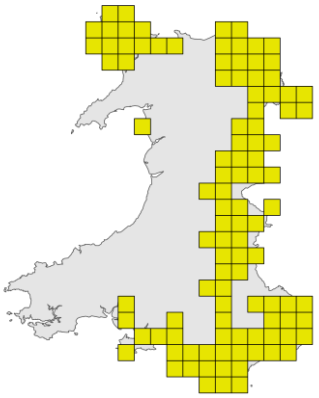
Measures focus on habitat protection, restoration, and management, particularly through agri-environment schemes and spatial planning. These include preventing conversion of natural habitats, restoring boundary features and ponds, and ensuring water quality and connectivity. Specific actions address invasive species control, pond desilting, and habitat management at post-industrial and SAC sites. Tree planting near breeding ponds is regulated to avoid shading, and green infrastructure in developments aims to minimise harm and enhance habitat.

Although suitable habitat area is generally sufficient, the quality is increasingly compromised by pond succession, nutrient enrichment, and lack of active management. Spatial planning could improve outcomes by targeting positive conservation measures, but current data gaps and limited surveillance hinder accurate forecasting. The species' future is uncertain due to these constraints, alongside new threats such as Bsal. Without a comprehensive monitoring scheme and effective implementation of management measures, the future prospects of the species remain unknown.

This first Wales-level assessment of great crested newt classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

ANNEX II, IV

Credit: Mike Hammett



Distribution map for S1166

Range map for S1166

S1166 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 331

Population size in National Site Network: 62

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Unknown

S1166 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1213 Common frog (*Rana temporaria*)

ANNEX V

The common frog (*Rana temporaria*) is widespread and generally common across Wales, although it remains under-recorded, with many 10km grid squares represented only by historical data. This species occupies a broad range of habitats from sea level to elevations over 300 metres, including both semi-natural and urban areas, provided there is a suitable spawning water body and sufficient terrestrial habitat for foraging. Adults typically return to their natal ponds to breed, making them vulnerable to habitat fragmentation and pond loss. Potential future threats may also arise from disease.

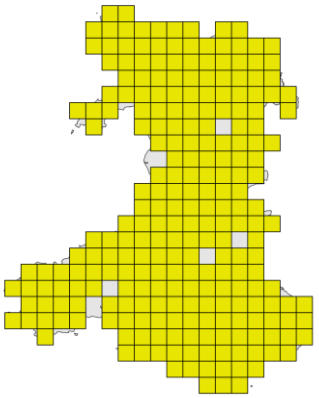
In Wales, the current distribution of the species is based on long-term data and often assumes continued presence in historically recorded sites. Records have been sourced from the National Amphibian Survey, the National Amphibian and Reptile Recording Scheme, and incidental sightings logged by Local Record Centres. Distribution mapping is derived from 1km square records and represents a minimum population estimate. No significant population change has been observed in the short term. While there is no formal habitat quality evaluation, the overall area appears sufficient to support populations.

Primary pressures on the species include agricultural intensification and habitat restructuring, which degrade both terrestrial and aquatic environments. The removal of field boundaries and pond management cessation reduces habitat quality and connectivity. Invasive non-native species, including *Crassula* and other aquatic plants, physically reduce habitats and complicate management. Road infrastructure can fragment habitats and cause direct mortality during migration, while associated runoff and drainage features pose additional risks. Diseases such as chytridiomycosis and especially ranavirus have been identified in the species and can cause mass mortality.

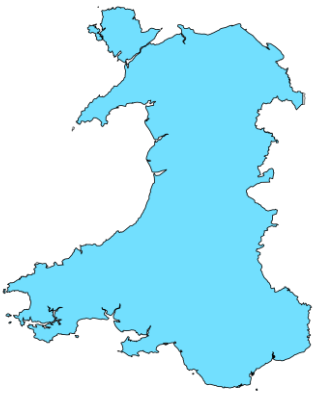
The species is considered likely to remain stable in Wales for the foreseeable future. Its wide distribution and resilience to habitat modification support this outlook. There is no expected change in the species' range or population over the next 12 years. Public participation in monitoring schemes such as the PondNet Spawn Survey and Record Pool contributes to ongoing data collection. However, the effects of climate change, particularly warmer winters, on long-term viability remain unknown.

This first Wales-level assessment of common frog classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Thomas Doherty-Bone, NRW



Distribution map for S1213



Range map for S1213

S1213 Species population and short-term trends

Population size unit: number of map 10x10 km grid cells

Population size: 244

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Unknown

S1213 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1261 Sand lizard (*Lacerta agilis*)

The sand lizard (*Lacerta agilis*) in Wales occupies sand dune habitats where it lays eggs in open sand and seeks shelter in dense Marram grass. Monitoring is not performed systematically at all sites each year.

Sand lizards were extinct in Wales until a reintroduction programme began in 1995. By 2013, they were recorded in 13 1km squares, increasing to 26 by 2024. In the 2019 report 15 1km squares were recognised, excluding 6 squares from unauthorised releases. However, recent genetic evidence has identified that these populations are genetically consistent with the reintroduced populations and these records have been included in the 2024 report.

The main pressures and threats affecting sand lizards are dune stabilisation and reduction in open sand needed for egg laying. Natural succession processes, including scrub encroachment, lead to habitat shading and reduced dune mobility. Atmospheric nitrogen deposition and other airborne pollutants can contribute to dune stabilisation. Additional lower ranked pressures include under-grazing, for example the decline of rabbits due to disease impacts regulation of sand dune habitat. Climate change effects such as sea-level rise and temperature shifts pose risks to the species' reproductive patterns and habitat structure.

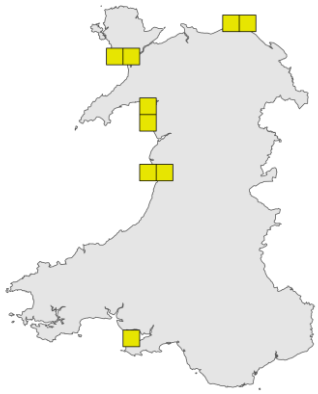
Conservation actions have focused on habitat management to slow natural succession and control problematic native and invasive species. Restoration of habitats, including sand patching and removal of enriched soils, has been implemented. Reintroductions have occurred at various sites, primarily within Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs). Measures are needed to address potentially invasive species such as pampas grass. Coastal system management includes interventions such as notching dunes to restore natural sand movement.

Reintroduced populations are breeding and expanding at existing sites, though dune habitat expansion is physically constrained. The population is currently stable, but habitat quality is slightly deteriorating and expected to continue declining over the next 12 years. The species' range is projected to remain stable in this timeframe, with significant losses or range expansion considered unlikely. Existing pressures may limit the effectiveness of current conservation measures in halting habitat degradation.

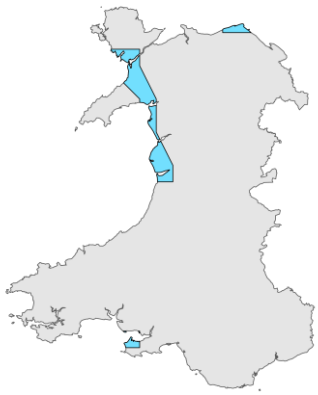
This first Wales-level assessment of Sand lizard classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Improving, consistent with the previous UK-level evaluation.

ANNEX IV

Credit: Mike Hammett



Distribution map for S1261



Range map for S1261

S1261 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 26

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Increasing

Habitat short-term trend: Stable

S1261 Favourable conservation status and trend

Range status: Unfavourable-inadequate (U1)

Population status: Unfavourable-inadequate (U1)

Habitat status: Favourable (FV)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Improving

For full supporting evidence, see the searchable table of detailed reports.

S6284 Natterjack toad (*Epidalea calamita*)

ANNEX IV

The Natterjack toad (*Epidalea calamita*) breeds in shallow pools found on sand dunes or inland areas of saltmarsh. Its terrestrial habitat consists of short grazed vegetation, and its breeding sites are vulnerable to vegetational succession or colonisation by other species such as common toads or fish if left unmanaged.

Natterjack toads were extinct in Wales from the 1960s until 1995 when the first of a series of reintroductions took place as part of the Species Recovery Project. All reintroduced sites in Wales are monitored annually for calling males and spawn strings. These populations are spreading at each site, occupying managed or created ponds, with increased counts of spawn strings and emerging toadlets. Population numbers fluctuate with the water levels in breeding ponds, though rescue efforts are employed if ponds dry prematurely. From 2013 to 2018, the number of occupied 1km squares rose from 6 to 11, then decreased to 9 by 2019–2024 due to record updates and non-persistence at some sites.

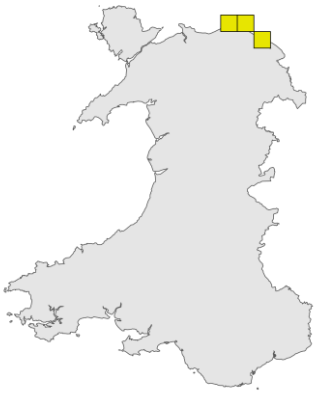
The species faces several ongoing pressures and threats in Wales. Under- or overgrazing leads to dune stabilisation and fragmentation, making habitats unsuitable. Scrub encroachment causes pond siltation and drying. Native species such as fish and common toads predate or outcompete natterjack larvae, while plant colonisation alters habitat suitability, including invasive species such as *Clematis vitalba*. Airborne nitrogen and surface water pollution promote vegetation succession. Climate-related threats include rising sea levels and increased pond desiccation due to higher temperatures. Habitat loss from coastal development further compounds these issues.

Conservation actions include habitat management to prevent succession and preserve open sandy patches. Problematic native and invasive species are controlled, with some requiring habitat restoration after removal. Habitat restoration benefits both sand dunes and the species. Reintroductions have occurred at multiple sites, with scope for expansion to new areas with suitable conditions. Hydrological interventions, such as dune notching support natural dune dynamics. Existing sites require ongoing management to maintain breeding suitability and prevent overgrowth.

Looking forward, the reintroduced population is increasing within release sites, with efforts underway to identify additional locations. These plans are contingent on habitat suitability and appropriate management. However, future risks remain, particularly the potential impacts of chytrid fungus on population viability and the broader effects of climate change, such as coastal instability and drought. Although a strategy for further reintroductions may expand the species' range, the outlook remains uncertain though stable.

This first Wales-level assessment of Natterjack toad classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Mike Hammett



Distribution map for S6284

Range map for S6284

S6284 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 9

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Stable

S6284 Favourable conservation status and trend

Range status: Unfavourable-inadequate (U1)

Population status: Unfavourable-bad (U2)

Habitat status: Favourable (FV)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

5.2 Bat species

Image credit: Sam Dyer, NRW

S1303 Lesser horseshoe bat

S1304 Greater horseshoe bat

S1308 Barbastelle

S1309 Common pipistrelle

S1312 Noctule

S1314 Daubenton's bat

S1317 Nathusius' pipistrelle

S1320 Brandt's bat

S1322 Natterer's bat

S1323 Bechstein's bat

S1326 Brown long-eared bat

S1327 Serotine

S1330 Whiskered bat

S1331 Leisler's bat

S5009 Soprano pipistrelle

S1303 Lesser horseshoe bat (*Rhinolophus hipposideros*)

Lesser horseshoe bats (*Rhinolophus hipposideros*) require a complex mosaic of habitats to support foraging, roosting and commuting behaviour. Woodlands are important foraging habitats, with the majority of activity being with 2-2.5km of summer roosts and 1.2km of hibernation sites. Where foraging habitat, summer roosts and hibernation roosts are all within close proximity, and with good connectivity, colonies tend to thrive if roosting conditions are ideal. Roost enhancements are often required to ensure a suitable range of conditions. Night roosts are also important and can extend foraging range allowing bats to conserve energy when returning to maternity roosts is inefficient. For further information on Lesser horseshoe bats, see the JNCC species account https://sac.jncc.gov.uk/species/S1303/.

Lesser horseshoe bats occur across much of Wales, excluding north Anglesey, coastal Ceredigion, and parts of northern Carmarthenshire. Strongholds include Gwynedd, Conwy, Northern Powys, Southern Powys, and Monmouthshire. The best current population estimate is 31,279 individuals, based on 70% female occupancy. The population trend from 2017 to 2022 increased significantly by 31.2% from hibernation roost data, and increased by 6.5% from maternity roost data, although the latter was not statistically significant.

Key pressures include building development affecting roost sites, habitat loss due to forestry practices, infrastructure development, loss of landscape connectivity and disturbance from recreation in hibernation sites. Road construction and associated lighting pose risks of collision and fragmentation of commuting routes.

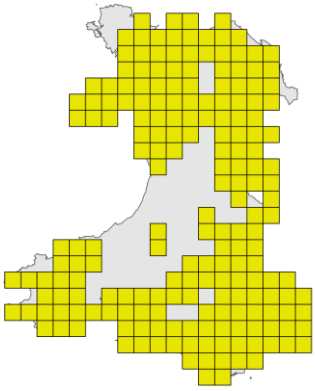
Conservation actions through legal protection address roost threats from development, transport/infrastructure, and recreation and lighting. Habitat-focused measures include restoring landscape connectivity features, adapting agricultural practices, and managing forest use to support the species' habitat needs.

The population trend is positive and likely to continue under climate change scenarios. The range is expected to remain stable, with potential for expansion under future climate conditions. Available habitat is considered sufficient and stable, supporting a favourable conservation status.

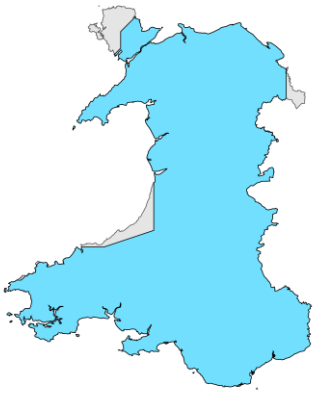
This first Wales-level assessment of Lesser horseshoe bat classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Improving, consistent with the previous UK-level evaluation.

ANNEX II, IV

Credit: Sam Dyer, NRW



Distribution map for S1303



Range map for S1303

S1303 Species population and short-term trends

Population size unit: number of individuals

Population size: 29,827

Population size in National Site Network: 5,750

Range short-term trend: Stable

Population short-term trend: Increasing

Habitat short-term trend: Stable

S1303 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Improving

For full supporting evidence, see the searchable table of detailed reports.

S1304 Greater horseshoe bat (*Rhinolophus ferrumequinum*)

Greater horseshoe bats (*Rhinolophus ferrumequinum*) require a mosaic of habitats including grazed pasture, meadows and deciduous woodland. The majority of foraging occurs within 4km of the roost but they regularly fly greater distances than this. The species is highly faithful to its roosts. Maternity roosts are usually in roof spaces of old buildings, and hibernation roosts are typically located in underground in caves, mines, or cellars which offer stable temperatures and high humidity. For further information on Greater horseshoe bats, see the JNCC species account https://sac.jncc.gov.uk/species/S1304/.

The Greater horseshoe bat has a restricted distribution in Great Britain. In Wales, five maternity roosts are known; all are in the south with the largest three in Pembrokeshire. The population is estimated at 4,512 individuals, based on 70% female occupancy of maternity colonies. The Welsh population trend from 2017 to 2022 increased significantly based on hibernation roost survey data. In recent years a spread northwards has been observed.

Key ongoing pressures include abandonment of pastoral systems, lack of cattle grazing in close proximity to roost sites, compounded by use of anthelmintics as dung beetles form a key component of the diet, along with increasing urbanisation resulting in loss of foraging habitat and impacts on roost sites. Linear infrastructure construction and related lighting disrupt commuting routes and increase mortality risk from collisions. Recreational activities within underground sites may disturb hibernating bats, and reopening or collapse of mines threatens hibernation sites. Forestry practices that reduce woodland quality and extent, loss of mating roosts, and natural catastrophes such as late cold springs also pose risks. Population and range may be vulnerable due to large percentages of the breeding population being located in just 5 maternity roost sites; the impact of loss of any one would be highly significant.

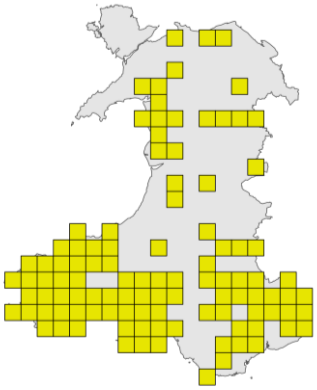
Legal and administrative actions and site designations ensure protection of habitats and management aligned with bat conservation, addressing pressures from development and recreation. Road and lighting infrastructure design must account for the species' needs. Agricultural and forestry schemes must manage grazing, anthelmintic use, and preserve small landscape features. Landscape-level planning protected commuting and foraging areas are important for species which display significant movement.

Future prospects for Greater horseshoe bat in Wales are considered positive due to legal protection of known maternity and hibernation roosts, positive population trends, and no anticipated decline in habitat quality or range. Long term, the species shows a continued northward range expansion and climate change effects, such as warmer springs, are expected to support further population growth and spatial expansion.

This first Wales-level assessment of Greater horseshoe bat classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Improving, consistent with the previous UK-level evaluation.

ANNEX II, IV

Credit: Sam Dyer, NRW



Distribution map for S1304

Range map for S1304

S1304 Species population and short-term trends

Population size unit: number of individuals

Population size: 4,512

Population size in National Site Network: 3,027

Range short-term trend: Increasing

Population short-term trend: Increasing

Habitat short-term trend: Stable

S1304 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Improving

For full supporting evidence, see the searchable table of detailed reports.

S1308 Barbastelle (*Barbastella barbastellus*)

The barbastelle bat (*Barbastella barbastellus*) is a woodland specialist that uses a complex mosaic of habitats for roosting, foraging, and commuting. Foraging typically occurs in woodlands or parks, as well as along forest edges, hedgerows, waterways, and treelined roads. Preferred roosts are narrow crevices in trees or buildings, often in cracks, splits and behind loose bark. Core range of females from maternity colonies is 8km, but they can fly long distances rapidly, frequently crossing very open habitat including downland and moorland, to reach other woodlands or core foraging areas up to 20km away. For further information on Barbastelle, see the JNCC species account https://sac.jncc.gov.uk/species/S1308/.

Barbastelle is a rare species in Wales, with a scattered distribution and low population density. Breeding has only been confirmed in the south east and Pembrokeshire. The population estimate has not been updated since Harris et al. 1995 due to insufficient data, and no short-term trend can be identified. The species is considered under-recorded, and as a result distribution data are of poor quality.

Primary pressures include forestry practices such as logging, clear-cutting, and removal of old or dead trees, which affect roost availability. Agricultural changes such as land use conversion, drainage, and the removal of small landscape features reduce foraging habitat and disrupt commuting routes. Pesticide use likely reduces prey availability, as the species feeds predominantly on moths. Invasive pathogens threatening native broadleaf trees and linear infrastructure developments also pose significant threats.

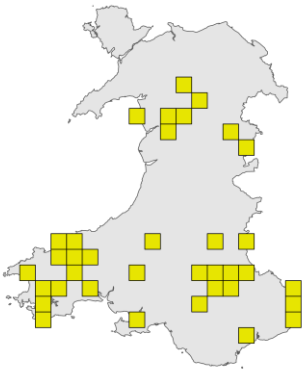
Identified conservation actions include adapting forestry practices, the prevention of habitat conversion, maintaining deadwood and restoring small landscape features. Legal protection remains necessary, though further measures are constrained by data gaps. Improving knowledge of the species is therefore a priority in Wales. The low population density and reliance on specific habitats exacerbate vulnerability to habitat loss and prey decline.

Future prospects for the barbastelle bat in Wales remain uncertain due to a lack of data on range and population size. Without enhanced understanding, effective conservation planning is impeded and populations may be lost before being discovered. Widespread acoustic surveys using established methodologies could improve knowledge, but sufficient resourcing is required. The rarity of the species and its dependence on under recorded habitats presents challenges for protection of the species.

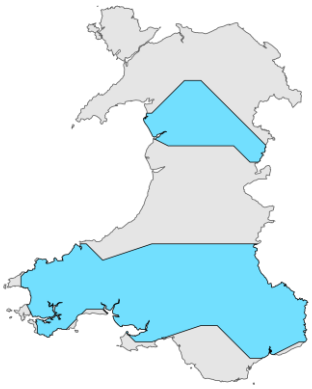
This first Wales-level assessment of Barbastelle classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unknown status. The overall species trend in Wales is assessed as Unknown, consistent with the previous UK-level evaluation.

ANNEX II, IV

Credit: Sam Dyer, NRW



Distribution map for S1308



Range map for S1308

S1308 Species population and short-term trends

Population size unit: number of individuals

Population size: 500

Population size in National Site Network: NA

Range short-term trend: Unknown

Population short-term trend: Unknown

Habitat short-term trend: Unknown

S1308 Favourable conservation status and trend

Range status: Unfavourable-inadequate (U1)

Population status: Unknown (XX)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

S1309 Common pipistrelle (*Pipistrellus pipistrellus*)

Common pipistrelle (*Pipistrellus pipistrellus*) is abundant and widely distributed throughout Wales, with distribution gaps likely only due to lack of survey data. It typically roosts in buildings of various types, from ancient churches to modern bungalows. Many records originate from household enquiries or consultant surveys related to development. Field records prior to the taxonomic split between *P. pipistrellus* and *P. pygmaeus* (1997) cannot be confidently assigned to either species.

The population size is estimated to be between 96,600 and 732,000 individuals, with a best estimate of 297,000. These figures were derived using adult bat density across habitat quality levels and multiplying by the habitable area. Whilst the National Bat Monitoring Programme (NBMP) roost count data shows a significant decline in the long and short term in Wales, a reliable trend cannot be drawn due to frequent roost switching.

Pressures are categorised into those affecting roosts and those affecting foraging and commuting. Urban development and associated pollution, including light and noise, affect roost sites. Modern building practices and roofing materials may further limit suitable roosting opportunities. Agricultural and forestry activities can degrade habitats and reduce insect prey biomass, with specific concerns including land use changes, removal of landscape features, and use of chemicals. Infrastructure such as wind turbines and roads leads to mortality through collisions.

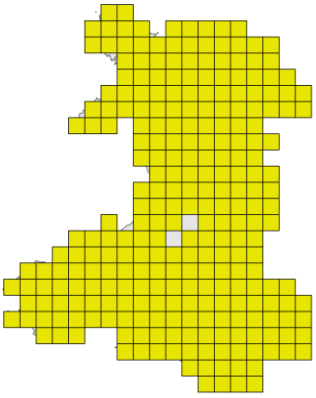
Conservation measures include adapting wind energy and transport infrastructure to mitigate impacts. Legal protections require mitigation when developments affect roosts. Pollution and land conversion impacts are addressed through legal and agri-environmental schemes. Guidance supports planners, developers, and land managers in accommodating bat conservation needs.

The future range, population, and habitat availability for Common Pipistrelle in Wales are considered overall stable. Habitat remains adequate and widespread. Although Wales-specific population trends cannot be quantified, the short term GB trend is stable. However, future pressures from legislation changes, planning policies, and development may present unknown challenges.

This first Wales-level assessment of Common pipistrelle classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

ANNEX IV

Credit: Sam Dyer, NRW



Distribution map for S1309

Range map for S1309

S1309 Species population and short-term trends

Population size unit: number of individuals

Population size: 297,000

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Uncertain

Habitat short-term trend: Stable

S1309 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1312 Noctule (*Nyctalus noctula*)

The noctule (*Nyctalus noctula*) is a widespread and relatively common bat species in Wales. It is typically associated with woodland, and most known roosts are in trees, though it also uses buildings. The species displays powerful, direct flight and is often observed in open spaces above the tree canopy, diving steeply to catch insects. It produces a loud echolocation call more detectable over long distances than many species, though accurate identification in cluttered habitats may be complicated by similarity to calls of *N. leisleri* and *Eptesicus serotinus*.

Although no structured distribution survey programme exists, updated range maps have incorporated recent data which is readily collected via non standardised surveys. The population trend in Wales is unknown due to lack of trend data, however, the Great Britain trend is stable for the long and short term.

As a predominantly tree-roosting species, the noctule is vulnerable to loss of roost sites due to removal of dead, dying, or old trees and forest clear-felling. Pressures that reduce flying insect biomass, such as pesticide use, poor water quality, and habitat simplification from agricultural practices, also pose risks. Although the species mainly roosts in trees, its occasional use of buildings exposes it to development-related impacts. Wind turbines represent a significant threat, with studies from the European continent indicating a high risk of bat fatalities and population-level impacts.

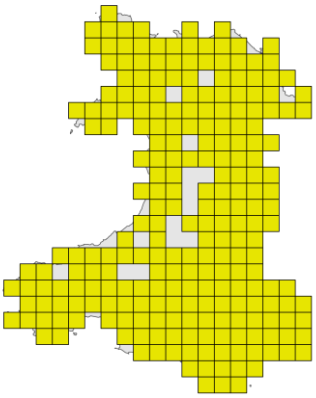
Legal protections and administrative actions are in place to safeguard noctule roosts. Conservation measures which adapt forest management are also required to protect roosts and foraging habitats. Agricultural schemes aim to maintain roost habitats and promote insect prey abundance. Wind turbine operation must be managed to mitigate bat mortality.

Despite gaps in data, the noctule remains a relatively common and widespread species in Wales. With no indication of range or population decline and stable habitat availability, the species' future prospects are considered overall stable. However, the high risk posed by wind power development remains a significant concern.

This first Wales-level assessment of noctule classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

ANNEX IV

Credit: Sam Dyer, NRW



Distribution map for S1312

Range map for S1312

S1312 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 759

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Unknown

Habitat short-term trend: Stable

S1312 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1314 Daubenton's bat (*Myotis daubentonii*)

Daubenton's bat (*Myotis daubentonii*) is widely distributed in Wales. The species primarily forages over open water bodies and slow-flowing rivers. Roosts are mainly found in trees, occasionally in built structure crevices or bridges. Daubenton's bats are regularly encountered in low numbers during hibernation surveys however maternity roost records are scarce in Wales.

This species is relatively easy to identify within Myotis bats due to characteristic flight and foraging patterns over water. As a widespread species, some apparent gaps in the range are thought to reflect data deficiencies rather than actual absence. Population trends for the short and long term are considered stable in Wales.

Key pressures affecting Daubenton's bat include land-use changes in agriculture and forestry, water abstraction, and urban development. Roost availability is threatened by habitat modifications including infrastructure development and forestry operations. Foraging habitats face pressures from changes in water management, pollution, lighting around bridges and waterways, and noise disturbance. Habitat fragmentation and the reduction of insect prey biomass due to pollution or habitat modification also pose ongoing threats.

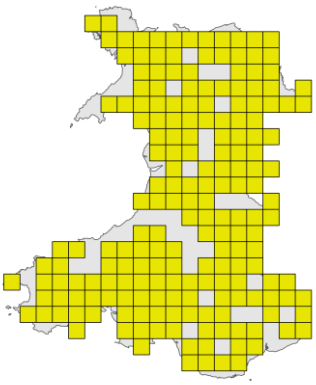
Current conservation measures include legal protections for roosts and the implementation of land management schemes in agriculture, forestry, and water management sectors. Strategies aim to maintain roost and foraging habitat integrity, reduce light, noise and water pollution, and ensure planning considers bat commuting routes. Infrastructure development is advised to include mitigation, such as safe crossings. Recreational impacts, such as those from caving on swarming and hibernation sites, are also targeted for reduction.

Future prospects for Daubenton's bat in Wales are considered stable. The species remains widespread and utilises a diverse mosaic of habitats. No short-term factors suggesting range expansion or contraction have been identified, and both range and population trends are assessed as stable. Although there is insufficient data on habitat quality changes, the continued widespread distribution and use of varied habitats indicate stable habitat conditions. Therefore, the overall outlook for the species in Wales over the next 12 years is likely to remain stable.

This first Wales-level assessment of Daubenton's bat classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

ANNEX IV

Credit: Sam Dyer, NRW



Distribution map for S1314

Range map for S1314

S1314 Species population and short-term trends

Population size unit: number of individuals

Population size: 108,000

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1314 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1317 Nathusius' pipistrelle (*Pipistrellus nathusii*)

ANNEX IV

The UK Nathusius' pipistrelle (*Pipistrellus nathusii*) population is at least partly migratory, though the proportion of residents to migrants is unknown. Nathusius' pipistrelle bats are strongly associated with large water bodies and typically forage in riparian habitats, broadleaved and mixed woodland. Records for Nathusius' pipistrelle bats are highly dispersed, due to typical habitat preferences not being commonly surveyed for development. Targeted schemes are relatively successful at recording the species when instigated. Despite detector records, it was only in 2024 that an individual was trapped in North Wales as part of a targeted survey. A low number have been caught in South Wales where detector records are more common.

No maternity sites have been found in Wales and its true status remains unclear. Actual population cannot be estimated and a trend cannot be estimated.

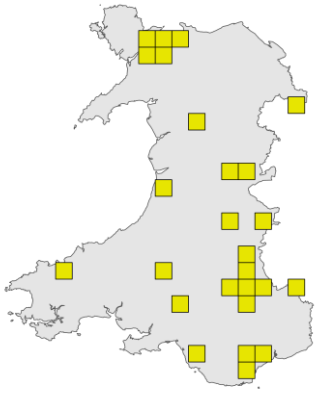
Wind, wave and tidal power developments pose a high risk to the species, which is known to be at risk of turbine collision in Europe. Infrastructure such as roads and railways, along with agricultural and forestry practices, may affect commuting, foraging habitats, and insect prey availability.

Legal and administrative measures remain necessary to ensure effective protection under existing legislation. Guidance has been developed to support planners and developers in assessing onshore wind energy impacts on bats, recommending appropriate mitigation with further clarification in progress. Offshore wind may have currently unmeasured impacts on migrating bats.

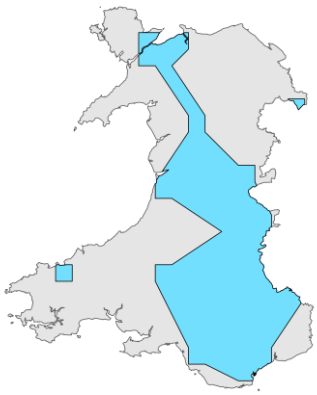
Records remain highly dispersed, reflecting limited acoustic recording availability and localised survey efforts. Targeted surveys are required to assess population and range trends. Although habitat quality remains uncertain, the area is expected to remain stable and no specific drivers of change have been identified. The future of the species' habitat in Wales is considered overall stable.

This first Wales-level assessment of Nathusius' pipistrelle classifies its overall conservation status as Unknown. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Unknown status. No overall trend in conservation status was reported in this Wales-level assessment or the previous UK-level assessment as the status was Unknown.

Credit: Sam Dyer, NRW



Distribution map for S1317



Range map for S1317

S1317 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 91

Population size in National Site Network: NA

Range short-term trend: Unknown

Population short-term trend: Unknown

Habitat short-term trend: Unknown

S1317 Favourable conservation status and trend

Range status: Unknown (XX)

Population status: Unknown (XX)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unknown (XX)

Overall trend: NA

For full supporting evidence, see the searchable table of detailed reports.

S1320 Brandt's bat (*Myotis brandtii*)

Brandt's bat (*Myotis brandtii*) is a cryptic species often confused with the whiskered bat and Alcathoe bat. Acoustic identification is difficult due to overlapping echolocation parameters and similarity with other Myotis species, making monitoring challenging. Where reliable records exist, they suggest that the Brandt's bat is much rarer than Whiskered with very few known maternity roosts in Wales.

Brandt's bats are widely distributed across Wales, though data gaps may reflect under-recording rather than absence. Due to identification difficulties, records for whiskered and Brandt's bats are combined, likely biasing the distribution estimate toward the commoner whiskered bats. Monitoring data suggest a stable short-term population trend in Wales, although not statistically significant and caution is advised. This trend should be interpreted with caution as it combines data from two species with differing ecological requirements and potentially differing conservation status.

Brandt's bats face pressures on both roosting and foraging habitats. Roost-related pressures include developments and building conversions, forestry practices, and disturbance of hibernation sites through recreational use of underground sites. Foraging and commuting pressures result from intensive grazing, infrastructure development, habitat fragmentation, and loss of small landscape features.

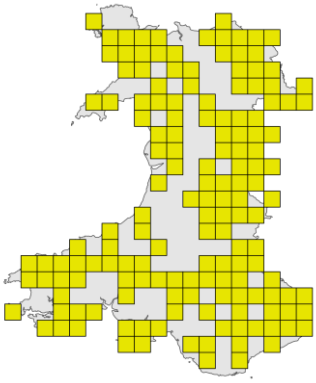
Legal and administrative protections are in place but require continued enforcement and management of protected habitats. Land management schemes are used to ensure woodland and field boundary habitats near roosts are suitable for insect prey availability. Planning efforts focus on maintaining commuting routes and mitigating recreational disturbance at swarming and hibernation sites. Despite legal protections, a lack of species-specific data hampers effective conservation planning and impact assessment.

The species' range and population in Wales are considered stable, but data limitations and overlap with the whiskered bat obscure trends. No specific short-term drivers of change have been identified, and habitat trends are also considered stable.

This first Wales-level assessment of Brandt's bat classifies its overall conservation status as Unknown. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales does not need to be assessed, but was Stable in the previous UK-level evaluation.

ANNEX IV

Credit: Daniel Hargreaves



Distribution map for S1320

Range map for S1320

S1320 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 315

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1320 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unknown (XX)

Habitat status: Favourable (FV)

Future prospects status: Unknown (XX)

Overall status: Unknown (XX)

Overall trend: NA

For full supporting evidence, see the searchable table of detailed reports.

S1322 Natterer's bat (*Myotis nattereri*)

ANNEX IV

Natterer's bat (*Myotis nattereri*) is widely distributed and commonly recorded in Wales, with distribution gaps likely due to recording effort rather than true absence. The species is typically associated with broad-leaved woodland, tree-lined river corridors, parkland, and hedgerows next to pasture. Maternity roosts are found in trees, bat boxes, and buildings such as barns and churches, often near woodland. Hibernation and swarming occur in underground sites including tunnels, caves, and ice-houses.

Natterer's bat is recorded across Wales and is considered widespread. There have been no structured distribution surveys, but they are commonly recorded through development surveys and hibernation surveys. The estimated population ranges from 1,900 to 332,000 individuals, with a best estimate of 52,300. These wide estimates are due to uncertainty surrounding usage of both woodland and buildings for maternity roosting. The short term population trend showed an increase of 13.4% but this was not statistically significant and is reported as stable.

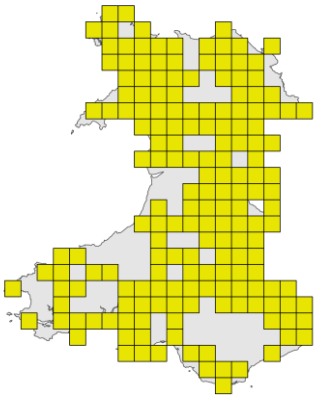
Pressures affecting Natterer's bat include loss or disturbance of roosts due to forestry works, construction and building modification, and recreational activities such as caving. Changes in forestry and agriculture practices, including removal of small landscape features, use of pest control methods, and changes in land use, impact commuting and foraging areas. Roads, infrastructure, artificial lighting, and pollution of waterways also pose ongoing threats.

Current conservation measures focus on legal and administrative controls to conserve roost sites and foraging areas. Restoring agricultural landscape features and adapting forestry practices is important for the species. Infrastructure development and the impacts of lighting requires careful design and controls. Environmental land management schemes may help maintain insect prey availability near roosts. Planning at the landscape scale and managing recreational disturbance at swarming and hibernation sites are also part of the required conservation approach.

The future of Natterer's bat in Wales is likely positive. The species' range and population are currently stable, with no short-term drivers of expansion or decline identified. Although detailed habitat quality data is lacking, the species' use of a mosaic of habitats and current trends suggest habitat conditions will remain stable. Overall, future prospects for range, population, and habitat are assessed as stable.

This first Wales-level assessment of Natterer's bat classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Sam Dyer, NRW



Distribution map for S1322

Range map for S1322

S1322 Species population and short-term trends

Population size unit: number of individuals

Population size: 52,300

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1322 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1323 Bechstein's bat (*Myotis bechsteinii*)

ANNEX II, IV

Bechstein's bat (*Myotis bechsteinii*) is a rare, woodland-dependent species that requires a complex habitat mosaic to support roosting, foraging, and commuting. It typically roosts in tree cavities, such as woodpecker or rot holes. Maternity colonies favour structurally diverse ancient deciduous woodland, particularly those with oak and dense understorey. Foraging ranges are typically small and are usually 500–1,500 metres from roosts but can extend up to 4 km. In winter, individuals are found roosting singly in underground sites like caves and mines, although tree cavities are likely used. For further information on Bechstein's bat, see the JNCC species account https://sac.jncc.gov.uk/species/S1323/.

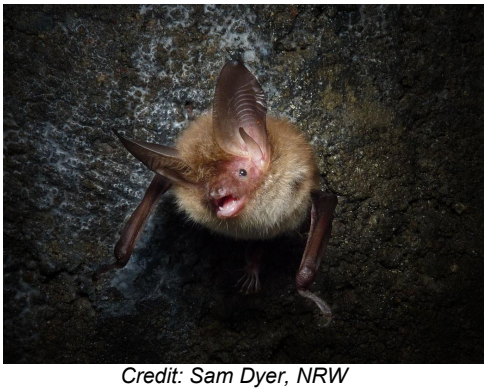
This species has only recently been confirmed as breeding and resident in Wales, following trapping surveys in southern Monmouthshire in 2018. Subsequent targeted trapping in NRW-managed woodlands in South West Wales has yielded further presence records. Despite these findings, the distribution in Wales remains poorly understood. The population is estimated at a minimum of 116, a maximum of 626, and a best estimate of 249 individuals. These estimates rely on habitat-based modelling using broadleaved woodland extent. There are insufficient data to determine short-term trends in Wales.

Bechstein's bat faces several pressures primarily linked to changes in woodland management. Infrastructure development such as roads and railways presents risks by fragmenting habitats and commuting routes, with light pollution further affecting emergence and foraging. The loss of small landscape features like hedgerows and the impact of invasive pathogens on broadleaved trees also pose threats. The species' specialised requirements, low density, and slow growth amplify vulnerability to these pressures.

Conservation actions centre around modifying or halting damaging forestry practices along with the control of development, infrastructure and lighting. Although the presence of Bechstein's bat in protected woodlands like the Wye Valley Special Area of Conservation (SAC) has been confirmed, no SACs in Wales list it as a qualifying feature. Legal protections remain necessary, but knowledge gaps hinder comprehensive action. Further research is needed to identify and implement effective measures.

The outlook for Bechstein's bat in Wales remains uncertain. Though recent records suggest a broader distribution than previously known, the rarity of confirmed sightings and limited survey coverage obscure a full understanding of its range and population dynamics. Continued targeted surveys and habitat assessments are essential to support informed management and safeguard this elusive species to ensure colonies are not lost before they are even discovered.

This first Wales-level assessment of Bechstein's bat classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unknown status. The overall trend in conservation status in this Wales-level assessment is Unknown; it was not reported in the previous UK-level assessment as the overall status was Unknown.



Credit: Sam Dyer, NRW

Distribution map for S1323

Range map for S1323

S1323 Species population and short-term trends

Population size unit: number of individuals

Population size: 249

Population size in National Site Network: NA

Range short-term trend: Uncertain

Population short-term trend: Unknown

Habitat short-term trend: Unknown

S1323 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unknown (XX)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

S1326 Brown long-eared bat (*Plecotus auritus*)

ANNEX IV

The brown long-eared bat (*Plecotus auritus*) is common and widespread throughout Wales. Distribution gaps likely reflect limited survey data rather than true absence. The species roosts in buildings and trees, although tree roosts are under-recorded. The species have very quiet echolocation calls and so it is also acoustically under-recorded.

The brown long-eared bat has had no structured distribution surveys; records are generally derive from ad-hoc observations, consultancy surveys and hibernation site surveys. The best estimate of adult population in Wales is 96,600 individuals, with a minimum of 5,370 and maximum of 228,000. These wide estimates are due to uncertainty surrounding usage of both woodland and buildings for maternity roosting. The reported short term population trend was considered stable, despite a 19.9% decrease, as the decline was not statistically significant. Since publication this figure has increased to a significant decline of -53.6%.

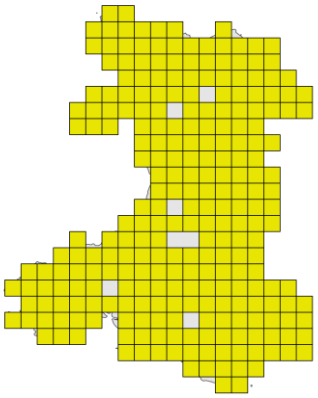
Main pressures on the brown long-eared bat include both roost and habitat impacts. Roost-related pressures involve building modifications, barn and loft conversions, and forestry operations removing tree roosts. The species is particularly vulnerable to roost loss due to its specific requirements and sensitivity to increased lighting. Commuting and foraging habitats are affected by changes in agriculture and forestry, such as landscape simplification and habitat fragmentation. Additional pressures include infrastructure development and vehicle collisions, to which the species is susceptible due to its low and slow flight.

Legal protections remain essential to ensure roost sites are protected. Conservation measures in place include land management and planning strategies to preserve and restore foraging habitats and maintain roosting options. Management practices in agriculture and forestry sectors aim to support insect prey availability and roost habitat quality. Specific interventions also target reducing impacts from roads and recreational activities including disturbance of hibernation sites, with landscape-scale planning to safeguard commuting routes and foraging grounds.

The outlook for the brown long-eared bat in Wales is considered stable in terms of range and habitat. No short-term drivers for range change have been identified, and the species continues to occupy a similar distribution to previous reporting periods. Although recent declines in trend data are cause for concern, further data is required to substantiate and understand the drivers for decline. Habitat prospects are also stable, with no major changes observed in habitat quality or availability.

This first Wales-level assessment of Brown long-eared bat classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Sam Dyer, NRW



Distribution map for S1326

Range map for S1326

S1326 Species population and short-term trends

Population size unit: number of individuals

Population size: 96,600

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1326 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1327 Serotine (*Eptesicus serotinus*)

The serotine bat (*Eptesicus serotinus*) is one of Wales largest bats. It utilises a range of habitats for foraging including open fields bordered by woodland edges, riverbanks, gardens, parks, and amenity areas. As a large bat they are capable of commuting significant distances and may use multiple foraging sites nightly. Serotine bat maternity roosts are usually in old houses or churches but occasionally in more modern houses. They utilise roof voids and cavity walls, often accessed via external cervices. Serotines are rarely found in hibernation, its likely they remain in buildings but are occasionally found in underground sites.

In Wales, the distribution and population of the serotine bat are poorly defined. It has been recorded in South Wales for a long time, however, its true range remains uncertain with only a couple of maternity roosts located. The species echolocation calls overlap with *Nyctalus* calls from bats in cluttered environments which often creates uncertainty over records. Previously considered absent in North Wales, in 2011 a significant maternity roost was discovered, along with several other roosts in the subsequent years, however, true distribution in the North is unclear and focused studies are still needed. Due to paucity of data, no population trends can be drawn for Wales.

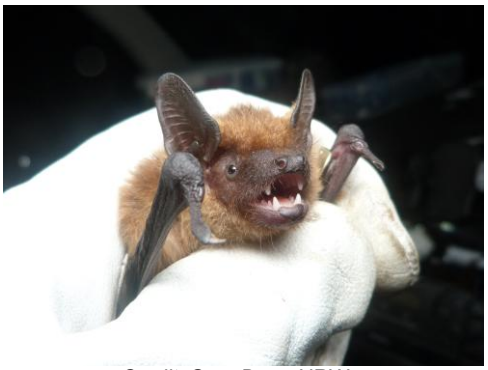
Serotine bats are subject to a variety of pressures. Roost loss may occur during buildings works and development projects. Foraging habitats are impacted by agricultural intensification, landscape simplification, and pest control practices that reduce insect prey abundance. Infrastructure developments like roads may lead to collisions and habitat loss. The species may also face risks from wind energy installations as a medium collision risk species.

Legal and administrative measures are required to safeguard roosts and manage habitat effectively. Landscape-scale planning must be employed to preserve commuting routes and ensure continuity of foraging areas. Conservation actions include restoring small landscape features, adapting forest management, and reinstating traditional farming practices. These strategies aim to support the species' ecological needs across agricultural and built environments.

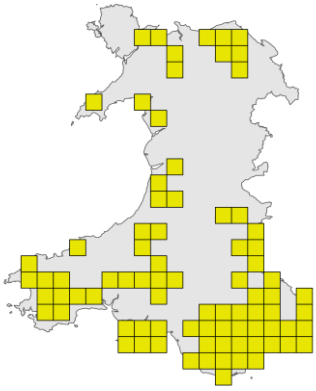
The future outlook for the serotine bat in Wales remains unclear. Prospects for range and population are classified as unknown due to insufficient data and under-recording. It is uncertain whether new records would reflect genuine expansion or better detection. However, habitat availability appears stable as no large-scale threats to habitat have been identified, suggesting continued stability.

This first Wales-level assessment of Serotine classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

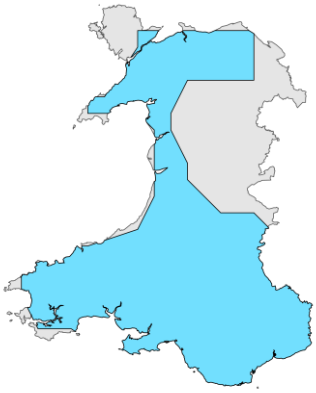
ANNEX IV



Credit: Sam Dyer, NRW



Distribution map for S1327



Range map for S1327

S1327 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 98

Population size in National Site Network: NA

Range short-term trend: Unknown

Population short-term trend: Unknown

Habitat short-term trend: Stable

S1327 Favourable conservation status and trend

Range status: Unfavourable-inadequate (U1)

Population status: Unknown (XX)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

S1330 Whiskered bat (*Myotis mystacinus*)

The whiskered bat (*Myotis mystacinus*) is a cryptic species often confused with Brandt's bat and Alcathoe bat. Acoustic identification is difficult due to overlapping echolocation parameters and similarity with other Myotis species, making monitoring challenging.

Whiskered bats are widely distributed across Wales, though some apparent range gaps may reflect under-recording. Due to identification difficulties, records for whiskered and Brandt's bats are combined, likely biasing the distribution estimate toward the commoner whiskered bats. Monitoring data suggest a stable short-term population trend in Wales, although this is not statistically significant and caution is advised. This trend should be interpreted with caution as it combines data from two species with differing ecological requirements and potentially differing conservation status.

Whiskered bats face pressures on both roosting and foraging habitats. Roost-related pressures include developments and building conversions, forestry practices, and disturbance of hibernation sites through recreational use of underground sites. Foraging and commuting pressures result from intensive grazing, infrastructure development, habitat fragmentation, and loss of small landscape features.

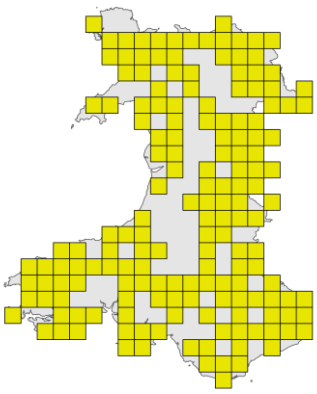
Legal and administrative protections are in place but require continued enforcement and management of protected habitats. Land management schemes are used to ensure woodland and field boundary habitats near roosts are suitable for insect prey availability. Planning efforts focus on maintaining commuting routes and mitigating recreational disturbance at swarming and hibernation sites. Despite legal protections, a lack of species-specific data hampers effective conservation planning and impact assessment.

The future outlook for the whiskered bat in Wales is considered stable across range, population, and habitat parameters. No short-term drivers have been identified that would cause significant changes in distribution or abundance. Despite data limitations and challenges in species separation, the continued widespread distribution and assumed adequate habitat suggest ongoing viability.

This first Wales-level assessment of Whiskered bat classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

ANNEX IV

Credit: Sam Dyer, NRW



Distribution map for S1330

Range map for S1330

S1330 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 315

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1330 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unknown (XX)

Habitat status: Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1331 Leisler's bat (*Nyctalus leisleri*)

ANNEX IV

Leisler's bat (*Nyctalus leisleri*) is rare throughout Wales, with most reliable records concentrated in the south-east. It forages in a variety of habitats including woodland, pasture, riparian areas, and along woodland edges. Maternity and hibernation roosts are predominantly located in trees, but they are also known to use buildings.

The species' status in Wales is unclear; resident populations are known in the Wye Valley region, and coastal records indicate potential migration between Great Britain and Ireland. Scattered acoustic records exist across Wales; however, verification can be difficult in clutter environments due to significant overlap with *N. noctula* and *Eptesicus serotinus*. Population and range trends in Wales cannot currently be assessed due to data deficiencies.

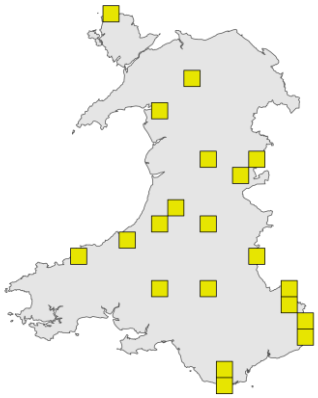
The main pressures on the species relate to the loss of tree and building roosts, and reductions in insect prey. Forestry practices such as removal of old or dead trees, clear-cutting, and reduction of old growth forests may decrease roost availability. Uncontrolled development and building modifications also pose risks through roost loss. Agricultural changes, including abandonment of traditional practices, removal of small landscape features, and increased pesticide use, may diminish insect biomass and suitable foraging conditions. Wind turbines represent a significant threat, with studies indicating Leisler's bats are a high collision risk species which could result in population-level impacts.

Legal protections and administrative actions are in place to safeguard Leisler's roosts. However, with limited information on location of roosts this is challenging, particularly within the forestry setting. Conservation actions currently in place aim to protect roosting and foraging habitats across both agricultural and forestry landscapes. These include restoring small landscape features, adapting agricultural practices and adapting forestry management to support bat roosts and habitats. Landscape-scale planning is encouraged to safeguard commuting routes and measures are also taken to mitigate risks from renewable energy installations through design adaptations, including wind turbine micro-siting and modified operation.

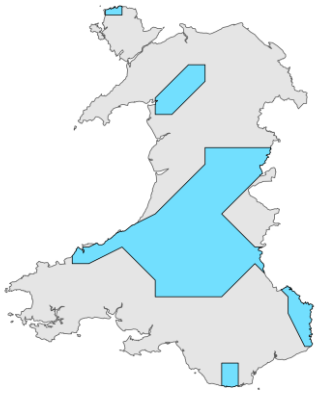
The future outlook for Leisler's bat in Wales suggests stability in range with no known drivers of range expansion or contraction. However, population prospects remain unknown due to insufficient data, and habitat quality cannot be reliably assessed. In the absence of identifiable pressures likely to cause significant change, both habitat and population are expected to remain broadly stable unless new populations are discovered beyond the currently known range.

This first Wales-level assessment of Leisler's bat classifies its overall conservation status as Unknown. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales does not need to be assessed as the status is Unknown, but the previous UK-level evaluation reported the trend as Stable.

Credit: Sam Dyer, NRW



Distribution map for S1331



Range map for S1331

S1331 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 45

Population size in National Site Network: NA

Range short-term trend: Unknown

Population short-term trend: Unknown

Habitat short-term trend: Unknown

.

S1331 Favourable conservation status and trend

Range status: Unknown (XX)

Population status: Unknown (XX)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unknown (XX)

Overall trend: NA

For full supporting evidence, see the searchable table of detailed reports.

S5009 Soprano pipistrelle (*Pipistrellus pygmaeus*)

ANNEX IV

The soprano pipistrelle (*Pipistrellus pygmaeus*) is abundant and widely distributed throughout Wales, with distribution gaps likely only due to lack of survey data. It commonly roosts in buildings of various types including ancient churches, barns, and modern bungalows. Many records originate from householder enquiries or development surveys by consultants. Field records prior to the taxonomic split between *P. pipistrellus* and *P. pygmaeus* (1997) cannot be confidently assigned to either species.

The population size is estimated to be between 202,000 and 862,000 individuals, with a best estimate of 478,000. These figures were derived using adult bat density across habitat quality levels and multiplying by the habitable area. Whilst the National Bat Monitoring Programme (NBMP) roost count data shows a significant decline in the long and short term in Wales, a reliable trend cannot be drawn due to frequent roost switching.

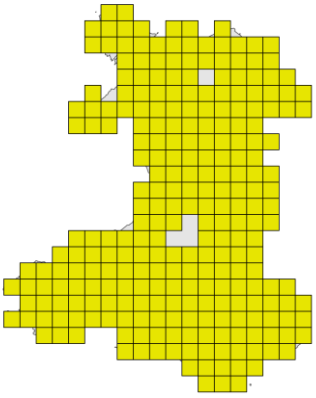
Pressures are categorised into those affecting roosts and those affecting foraging and commuting. Urban development and associated pollution, including light and noise, affect roost sites. Modern building practices and roofing materials may further limit suitable roosting opportunities. Agricultural and forestry activities can degrade habitats and reduce insect prey biomass, with specific concerns including land use changes, removal of landscape features, and use of chemicals. Infrastructure such as wind turbines and roads leads to mortality through collisions.

Conservation measures include adapting wind energy and transport infrastructure to mitigate impacts. Legal protections require mitigation when developments affect roosts. Pollution and land conversion impacts are addressed through legal and agri-environmental schemes. Guidance supports planners, developers, and land managers in accommodating bat conservation needs.

The future range, population, and habitat availability for Soprano pipistrelle in Wales are considered overall stable. Habitat remains adequate and widespread. Although Wales-specific population trends cannot be quantified, the short term GB trend is stable. However, future pressures from legislation changes, planning policies, and development may present unknown challenges.

This first Wales-level assessment of Soprano pipistrelle classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Sam Dyer, NRW



Distribution map for S5009

Range map for S5009

S5009 Species population and short-term trends

Population size unit: number of individuals

Population size: 478,000

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Uncertain

Habitat short-term trend: Stable

S5009 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

5.3 Fish species

Image credit: Rich Cove, NRW

S1095 Sea lamprey

S1096 Brook lamprey

S1099 River lamprey

S1102 Allis shad

S1103 Twaite shad

S1106 Atlantic salmon

S1109 Grayling

S6353 Gwyniad (Whitefish)

S6965 Bullhead

S1095 Sea lamprey (*Petromyzon marinus*)

The largest of the three native UK lamprey species, the sea lamprey (*Petromyzon marinus*) is an anadromous fish with a widespread distribution across accessible rivers in Wales. It is a designated feature in six Welsh river and three marine Special Areas of Conservation (SACs). Sea lampreys require clean river gravels for spawning. The larvae (ammocoetes) burrow in beds of organic silt and sand in deeper river water, feeding on bacteria and algae. Juveniles migrate from rivers out to sea, where they feed parasitically on a wide range of prey fish species including whiting, salmon and larger species such as basking sharks. They range much more widely in the marine environment than river lampreys. For further information on sea lamprey, see the JNCC species account https://sac.jncc.gov.uk/species/S1095/.

Since no accurate census population data are available at a Wales level, population is assessed using fine-scale distribution (number of occupied 1km squares). The current population is estimated at 428 occupied 1 km squares across Wales, though under-recording likely results in an underestimate. The 10 km square mapped range is based on records from databases and spawning observations in various Welsh rivers. A 29% increase in population size compared to the previous reporting round is noted, likely due to an increase in observer effort at spawning locations rather than an actual population rise. Large fluctuations in adult run size have been recorded, with annual counts on the Afon Tywi between 2015 and 2023 ranging from 743 to 5,858.

Key pressures include habitat destruction such as dredging, engineering works including dams and weirs, and pollution affecting larval development. Climate change may impact flow regimes and prey availability through increased flooding, drought, and altered ocean temperatures. Diffuse agricultural pollution contributes to water quality issues in both freshwater and marine habitats. However, these pressures are not thought likely to seriously threaten the sea lamprey population at present.

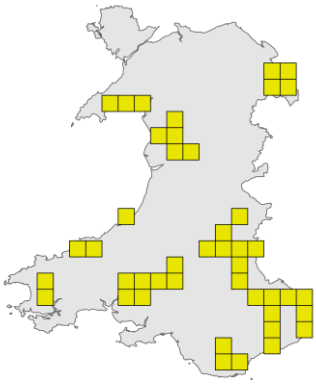
Conservation measures focus on improving river habitat and removing migration barriers through river restoration and fisheries projects. These initiatives have improved or restored 854 km of rivers in Wales and addressed 77 barriers, enhancing access to 954 km of rivers.

The population is expected to remain stable over the next decade although climate impacts such as lower flows and floods may affect larval survival and habitat stability. Planned works such as new fish passes at key barriers could enhance access to upstream habitats and improve population resilience.

This first Wales-level assessment of sea lamprey classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unknown status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Unknown.

ANNEX II

Credit: Annalisa Bianchessi



Distribution map for S1095

Range map for S1095

S1095 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 428

Population size in National Site Network: 292

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Uncertain

S1095 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1096 Brook lamprey (*Lampetra planeri*)

Brook lamprey (*Lampetra planeri*) is a freshwater species found across most rivers in Wales. The small, slender adults spawn in spring in clean gravels. Their larvae, called ammocoetes, spend up to six years burrowing in silt and sand, feeding on organic matter before metamorphosing. Unlike the other native lamprey species, brook lamprey adults do not feed. Brook lamprey is a designated feature in six river Special Areas of Conservation (SACs). For further information on brook lamprey, see the JNCC species account https://sac.jncc.gov.uk/species/S1096/.

Since no accurate census population data are available at a Wales level, population is assessed using fine-scale distribution (number of occupied 1km squares). Most records are of larvae collected through non-targeted surveys, as there were no lamprey-specific surveys from 2019–2024. The current population size is 94% of the previous round, likely due to reduced sampling effort rather than a genuine decline. It should be noted that larvae of brook lamprey cannot be distinguished from river lamprey larvae.

Brook lamprey are impacted by multiple pressures including physical alterations to water bodies such as dams and flow modifications; pollution from agriculture, livestock, and mixed sources further degrades habitat quality. Threats include drainage and climate-related changes to abiotic conditions such as altered water flows. However, these are not thought likely to seriously threaten the brook lamprey population at present.

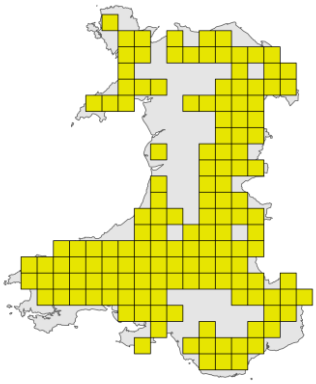
Conservation measures include river restoration, addressing barriers to fish migration, invasive species control and pollution reduction projects led by NRW and partner organisations. These initiatives have improved or restored 854 km of river environment and addressed 77 barriers, enhancing fish movement across 954 km of rivers.

Brook lamprey are a widespread and stable species in Wales, expected to remain so in the next decade although climate impacts such as lower flows and floods may affect larval survival and habitat stability. Restoration activities in conjunction with integrated catchment work will benefit the population by improving natural riverine processes and addressing multiple pressures.

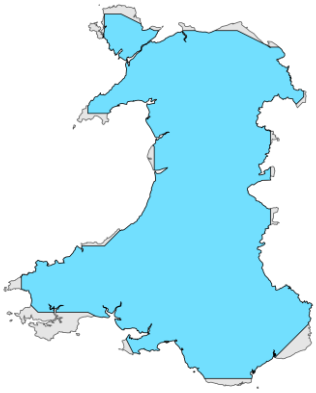
This first Wales-level assessment of brook lamprey classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unknown status. No overall trend in conservation status was reported in the previous UK-level assessment as the status was Unknown. In this reporting round, the overall species trend in Wales is assessed as Stable.

ANNEX II

Credit: NRW



Distribution map for S1096



Range map for S1096

S1096 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 1,494

Population size in National Site Network: 495

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Uncertain

S1096 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1099 River lamprey (*Lampetra fluviatilis*)

River lamprey (*Lampetra fluviatilis*) is an anadromous fish with a widespread distribution across accessible rivers in Wales. The larvae spend up to 4.5 years burrowing in silt and sand and feeding on organic matter before metamorphosing. They then migrate out to sea, where they feed parasitically on a wide range of prey fish. After two years in coastal waters, adults return to rivers in spring to spawn in well-oxygenated gravels and die shortly afterwards. River lamprey is a designated feature in six river and three marine Special Areas of Conservation (SACs). For further information on River lamprey, see the JNCC species account https://sac.jncc.gov.uk/species/S1099/.

Since no accurate census population data are available at a Wales level, population is assessed using fine-scale distribution (number of occupied 1km squares). The current population is estimated at 1,988 1 km squares which is a slight reduction to 92% of the previous cycle, likely due to reduced sampling effort rather than a genuine decline. In general, this species is under recorded in Wales with no specific surveys undertaken of larval lampreys. Larvae of brook and river lamprey are morphologically indistinct, complicating species identification during monitoring.

Key pressures include physical modifications such as dams and weirs that disrupt migratory pathways and alter river morphology, pollution, and climate change. Flow alterations from water abstraction and infrastructure can negatively affect lamprey life stages. These pressures are not thought likely to seriously threaten the sea lamprey population at present.

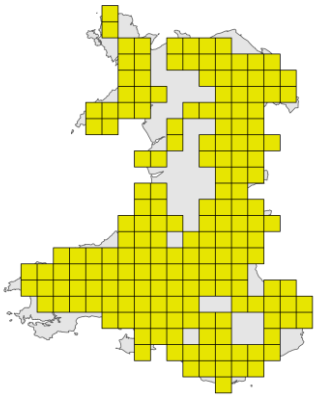
Conservation measures include river restoration, addressing barriers to fish migration, invasive species control and pollution reduction projects led by NRW and partner organisations. These initiatives have improved or restored 854 km of river environment and addressed 77 barriers, enhancing migratory fish access to 954 km of rivers. Fish passes are designed for multiple species, often implemented during broader infrastructure or restoration projects. There are several barriers which continue to prevent access to additional suitable habitat, for instance the Canaston and Haverfordwest weirs in the Afonydd Cleddau SAC.

River lamprey are a widespread and stable species in Wales, expected to remain so in the next decade although climate impacts such as lower flows and floods may affect larval survival and habitat stability. Restoration activities in conjunction with integrated catchment work will benefit the population by improving natural riverine processes and addressing multiple pressures.

This first Wales-level assessment of River lamprey classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Unknown.

ANNEX II, V

Credit: NRW



Distribution map for S1099

Range map for S1099

S1099 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 1,988

Population size in National Site Network: 660

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Uncertain

S1099 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1102 Allis shad (*Alosa alosa*)

Allis shad (*Alosa alosa*) is a medium-sized anadromous fish in the herring family that spawns at night in large rivers during late spring and early summer. The eggs drift a short distance downstream before settling in shallow riffles, hatching within about 4–7 days. Juveniles overwinter in the river before migrating to sea the following spring. At sea, they initially inhabit inshore waters, moving into deeper areas as they grow and feeding on mysid crustaceans. For further information on allis shad see the JNCC species account https://sac.jncc.gov.uk/species/S1102/.

The exact distribution of allis shad in Wales remains very uncertain due to the rarity of the species and difficulty of reliably distinguishing from the closely related twaite shad, with which allis shad hybridises. Any spawning is probably focused around larger rivers entering the Bristol Channel, particularly the Usk, Wye and Tywi. Allis shad records in other rivers, such as the Dee and Conwy, are sporadic and show no evidence of spawning.

Between 2006 and 2018, 188 1km squares contained shad or shad eggs; three credible angler records of allis shad were from the River Wye in 2012.

Obstructions such as weirs and dams are barriers to migration and significantly impact shad passage. Water abstractions can remove drifting eggs, though the population-level impact is uncertain. Physical changes to rivers, such as straightening and reinforcement, may degrade spawning and juvenile habitats. Pollution, particularly from intensive agriculture, poses a risk although shad are less sensitive than salmonids.

In the marine environment, power station cooling systems entrain large numbers of fish, including juveniles. Tidal power schemes around the Welsh coast are a future concern due to potential impacts on migrating shad.

The 4Rivers4LIFE project is improving migratory access in the Usk catchment. Unlocking the Severn improved access in the lower Severn, but further measures are needed to reach Welsh spawning grounds. Additional measures are needed in both the Usk and Severn catchments. Captive rearing and release may be considered to re-establish populations, subject to feasibility studies.

Allis shad remains extremely rare in Wales and may no longer exist as viable populations. Future range prospects are poor due to lack of recovery despite improved access and warming climate. Population recovery is unlikely due to collapse of French source populations. No major deterioration in habitat is expected in the near future.

This first Wales-level assessment of Allis shad classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

ANNEX II, V

Credit: Allis shad Life+ project

Due to uncertainty regarding records, no distribution or range maps are included here.

S1102 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 173

Population size in National Site Network: 172

Range short-term trend: Unknown

Population short-term trend: Stable

Habitat short-term trend: Stable

S1102 Favourable conservation status and trend

Range status: Unfavourable-inadequate (U1)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1103 Twaite shad (*Alosa fallax*)

Twaite shad (*Alosa fallax*) is an anadromous fish in the herring family. They spawn nocturnally in the wide, gravelly areas in larger rivers during late spring and early summer. Eggs drift briefly downstream before hatching in 4–7 days, settling in shallow riffles. Juveniles remain in rivers for approximately three months before migrating to sea, where they initially feed on crustaceans and later shift to small fish. For further information on Twaite shad, see the JNCC species account https://sac.jncc.gov.uk/species/S1103/.

Identification is difficult due to similarity with allis shad and high hybridisation rates, with some Welsh populations composed primarily of hybrids. Distribution is concentrated in larger rivers flowing into the Bristol Channel, especially the Usk, Wye, and Tywi, with additional populations suspected in Snowdonia rivers such as the Dwyryd, Glaslyn, and Mawddach.

Due to lack of census population data, population has had to be estimated using the number of occupied 1km squares. Population size is estimated at 173 1km squares. The current population represents 72% of the favourable reference value for Wales. Trends have been estimated using kick sampling for eggs. The Usk population has increased substantially, the Wye population may be increasing, and the Tywi population appears stable.

Major pressures include river modifications such as weirs and dams, which impede migration, and water abstraction, which reduces wetted area and can remove drifting eggs. River straightening and bank reinforcement degrade spawning and juvenile habitats. Pollution from agricultural sources and power station cooling systems pose risks in both freshwater and marine environments. Future threats also include proposed tidal power schemes and potential microplastic ingestion.

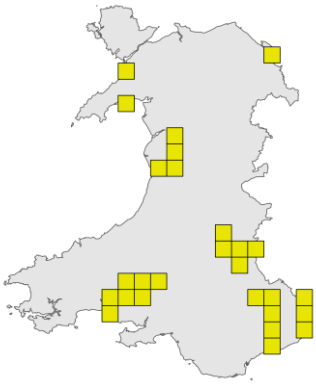
Key conservation efforts include the 4Rivers4LIFE project in the Usk and the Unlocking the Severn project. Primary measures focus on enhancing migratory access and addressing pollution and habitat modification. These efforts are expected to support recovery of twaite shad and other migratory fish species.

The future outlook for twaite shad in Wales is stable, with a potential increase in habitat suitability due to climate change. Warmer temperatures may lower mortality and boost population levels. Expanded access resulting from conservation projects could restore populations to former ranges and increase resilience. Continued progress depends on avoiding new migration barriers and maintaining habitat and water quality.

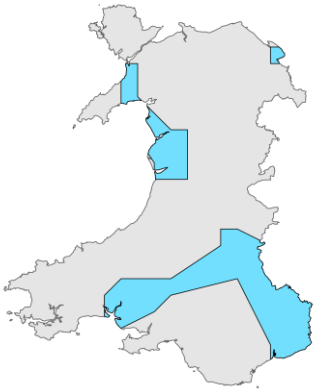
This first Wales-level assessment of Twaite shad classifies its overall conservation status as Unfavourable-bad. This is predominantly driven by continued lack of access to the Severn in Wales and is probably overly pessimistic. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Improving, compared to the previous UK-level evaluation which was Stable.

ANNEX II, V

Credit: Wye and Usk Foundation



Distribution map for S1103



Range map for S1103

S1103 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 173

Population size in National Site Network: 172

Range short-term trend: Stable

Population short-term trend: Increasing

Habitat short-term trend: Stable

S1103 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Improving

For full supporting evidence, see the searchable table of detailed reports.

S1106 Atlantic salmon (*Salmo salar*)

Atlantic salmon (*Salmo salar*) are found throughout Wales in most streams, rivers, and estuaries. They require high water quality during all life stages, with spawning adults needing clean gravel beds up to 40cm deep and juveniles requiring shallow, fast-flowing freshwater. Salmon migrate from marine habitats back to their natal rivers to spawn. In smaller Welsh rivers, returning adults have historically been dominated by grilse, which spend one winter at sea. For further information on Atlantic salmon, see the JNCC species account https://sac.jncc.gov.uk/species/S1106/.

Salmon are expected to be present in most Welsh watercourses, and their range has not changed markedly since 2019.

The latest assessments show that all 23 principal salmon rivers are failing to meet their Conservation Limits and Management Objectives. All 23 are classed as “at Risk” in 2024 and are projected to remain “at Risk” in 2029. Between 2019 and 2023, the estimated mean population size in Wales declined, with the 2023 figure of 8,593 fish being the lowest since records began in 1997. Modelled data indicate an 86% decline in Welsh salmon populations over the past 15 years.

Atlantic salmon in Wales face many pressures due to their use of diverse habitats for spawning, feeding, and migration. Climate change affects all aspects of their life cycle via changes to temperature, flooding, and marine conditions, reducing survival and growth. Other key pressures include physical barriers to migration, habitat modification, diffuse and point source pollution, exploitation by fisheries, air pollution, and invasive non-native species. Future threats include the spread of additional invasive species, the effects of renewable energy development, increased pesticide toxicity due to warming, and marine microplastics.

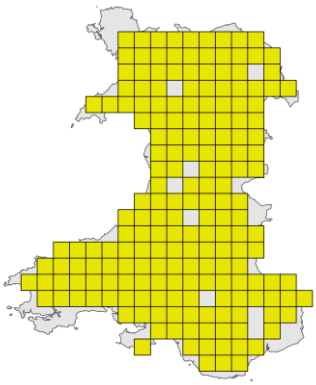
Conservation measures include river restoration, addressing barriers to fish migration, invasive species control and pollution reduction projects led by NRW and partner organisations. These initiatives have improved or restored 854 km of river environment through measures like limiting livestock access and enhancing shade and cover. In addition, these projects have addressed 77 barriers, enhancing migratory fish access to 954 km of rivers. Habitat restoration initiatives have improved 855km of river. Fishing byelaws were introduced in 2020, 2021, and 2023, with additional controls proposed for 2025. NRW also monitors water quality and enforces regulatory compliance.

Atlantic salmon in Wales are undergoing a severe decline and face possible extinction in many areas by 2030. Projections indicate that only the Wye, Dee, and Dysynni rivers may maintain viable populations by that time. Climate change is causing increasing habitat degradation across freshwater and marine environments. Despite substantial conservation efforts, the combined impact of these factors makes extinction across much of Wales within the next 20 years a real possibility.

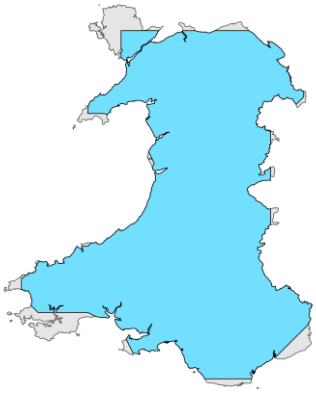
This first Wales-level assessment of Atlantic salmon classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

ANNEX II, V

Credit: Jack Perks



Distribution map for S1106



Range map for S1106

S1106 Species population and short-term trends

Population size unit: number of adults

Population size: 12900

Population size in National Site Network: 11070

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Stable

S1106 Favourable conservation status and trend

Range status: Unfavourable-inadequate (U1)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1109 Grayling (*Thymallus thymallus*)

Grayling (*Thymallus thymallus*) is a spring-spawning fish that inhabits cool, well-oxygenated rivers and streams with diverse flow and strong currents. It tends to prefer deeper water and gentler gradients than trout and often moves in shoals during the spawning season. Grayling are naturally found in three Welsh catchments: the Wye, Severn, and Dee.

While grayling are difficult to detect using electrofishing methods, catch returns and limited survey data have supported distribution mapping. Comparison of the favourable reference population map with the current population map suggests a near-maximum occupancy of suitable habitats within the species' native range. There is no evidence of recent range contraction or systematic population decline.

In Wales, the grayling population is stable and may be increasing, based on angler catch records across its three native catchments. Data from an annual fishing competition on the Dee show a gradual rise in abundance since 2006.

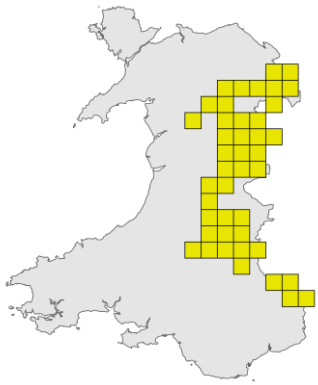
Grayling face several ongoing pressures in Wales. These include mixed-source pollution from agriculture and urban areas, which results in chemical and biological water quality failures. Hydromorphological changes such as flow modifications and physical alterations of rivers, including removal of woody debris, also affect habitat structure. Elevated river temperatures due to climate change and lack of shading further degrade conditions. Additional pressures include barriers to migration, problematic native species like piscivorous birds, and invasive species such as signal crayfish. Fishing pressure is minimal, with most anglers practising catch-and-release.

Conservation efforts for grayling involve a range of measures aimed at improving habitat quality and connectivity. Key initiatives include the LIFE Dee River project and the Upper Wye Restoration project, which address fish passage barriers, livestock exclusion, and agricultural pollution. Natural Resources Wales and partner organisations have collectively restored or protected extensive river lengths and habitats. These efforts are supported by regulation of grayling angling and targeted fisheries legislation, while national byelaws and angling clubs promote sustainable practices.

The future outlook for grayling in Wales is cautiously stable. The species retains high habitat occupancy and is expected to maintain its range and population over the next twelve years. Although habitat quality remains inadequate, it is not deteriorating significantly and may improve due to increased awareness and ongoing restoration projects. If current land and river management interventions continue, grayling numbers are likely to remain resilient, though ongoing monitoring—such as angler catch returns—would enhance understanding of population dynamics.

This first Wales-level assessment of Grayling classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Rich Cove, NRW



Distribution map for S1109

Range map for S1109

S1109 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 520

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1109 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S6353 Gwyniad (Whitefish) (*Coregonus lavaretus*)

ANNEX V

The gwyniad – the Welsh name for whitefish (*Coregonus lavaretus*) – is the only member of the Coregonidae family found in Wales, occurring naturally only in Llyn Tegid (Bala Lake), where it has been present since the end of the last Ice Age. It is an open water species that requires cool, well-oxygenated water. In winter, gwyniad inhabit the entire lake and spawn in shallow waters around New Year. In summer, they are mostly confined to deeper water, where the water remains cool and oxygen levels are relatively stable. The species feeds opportunistically on invertebrates from both benthic and planktonic sources and can reach a length of 40 cm, with a lifespan of about seven years.

As well as the Llyn Tegid population, there is a translocated population in Llyn Arenig Fawr, where it was introduced in the 2000s in case of a catastrophic oxygen crash in Llyn Tegid. No recent monitoring of either population has been conducted, and as a result there are insufficient data to determine a short-term population trend.

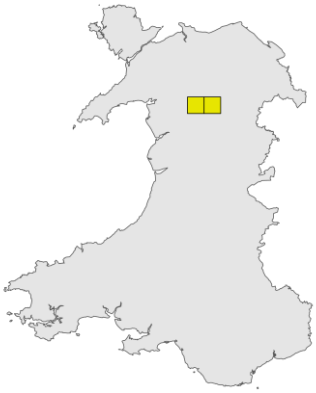
Gwyniad are primarily impacted by nutrient enrichment from agricultural and residential sources, leading to algal blooms and reduced oxygen levels. Silt deposition may also affect spawning gravel quality. Artificial management of lake levels may expose eggs to desiccation after spawning. Invasive species like *Crassula helmsii* and *Elodea nuttallii* threaten spawning grounds. Climate change poses a severe threat by intensifying algal blooms and oxygen depletion due to increased stratification and nutrient runoff, especially in Llyn Tegid.

While no specific actions have been implemented for gwyniad in the current reporting cycle, a long-term catchment management project is recommended. This should aim to reduce nutrient and sediment inputs from agriculture, sewage, and other local sources. The project would involve stakeholders including local residents, farmers, and water companies. Control efforts for invasive species like *Crassula helmsii* could be considered, although effective eradication may not be feasible.

Gwyniad is highly vulnerable to nutrient loading and climate change, which threaten its oxygen-dependent deepwater habitat through increased algal blooms and extended stratification. There is significant risk of catastrophic hypoxia in Llyn Tegid, potentially leading to population collapse, especially given that this lake supports over 90% of the Welsh population. The translocated population in Llyn Arenig Fawr is at lower risk due to the lake's low nutrient levels. Without intervention to reduce nutrient inputs, future habitat conditions are likely to deteriorate, jeopardising survival in Llyn Tegid.

This first Wales-level assessment of gwyniad classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Ian Winfield



Distribution map for S6353

Range map for S6353

S6353 Species population and short-term trends

Population size unit: number of individuals

Population size: NA

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Unknown

Habitat short-term trend: Stable

S6353 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S6965 Bullhead (*Cottus gobio* all others)

ANNEX II

The bullhead (*Cottus gobio*), is a small bottom-dwelling fish identifiable by its large head and typically grows no longer than 15 cm. It inhabits rivers, streams, and stony lakes with fast-flowing, clear, shallow waters and hard substrates such as gravel or cobble. The species does not tolerate heavily polluted rivers. For further information on bullhead, see the JNCC species account https://sac.jncc.gov.uk/species/S1163/.

Bullhead is widespread across Wales except in the far north and west where it has been absent since the last Ice Age. It is a designated feature in six river Special Areas of Conservation (SACs) rivers. Bullhead distribution has remained constant over the past 25 years.

Since no accurate census population data are available at a Wales level, population is assessed using fine-scale distribution (number of occupied 1km squares). The 2019–2024 estimate of occupied 1 km squares is 2,249, down from 2,798 in 2018, mainly due to reduced survey effort. Population size is likely underestimated due to under-recording and survey limitations, but overall appears stable.

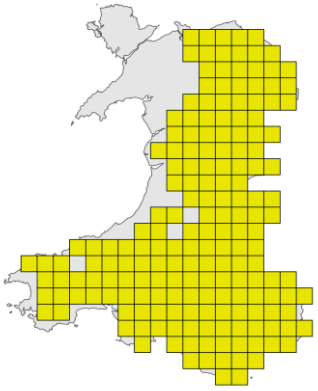
Bullhead are affected by habitat modifications including barriers that restrict fish passage and physical alterations such as dams and channelization. Low flows, high temperatures, and reduced dissolved oxygen levels due to hydrological changes further limit suitable habitat. Agricultural activities contribute to pollution and siltation, which degrades gravel substrates essential for reproduction and shelter. Invasive species exacerbate habitat degradation by predation, destabilizing riverbanks and increasing sediment input. Climate change poses an uncertain but likely threat by altering flow regimes, lower dissolved oxygen and increasing water temperatures. However, these pressures are not thought likely to seriously threaten the bullhead population at present.

Conservation measures include river restoration, addressing barriers to fish migration, invasive species control and pollution reduction projects led by NRW and partner organisations. These initiatives have improved or restored 854 km of river environment and addressed 77 barriers, enhancing fish movement across 954 km of rivers. Fish passes are designed for multiple species, often implemented during broader infrastructure or restoration projects. However, many fish passes may not benefit bullhead due to their limited swimming ability.

Bullhead populations in Wales are currently stable and expected to remain so over the next decade. Continued implementation of targeted conservation measures is anticipated to support habitat quality and enhance population resilience. However, the potential impacts of climate change, such as altered hydrological regimes and increased temperatures, remain a concern. Further research is needed to understand flow requirements and the ecological effects of disturbance on bullhead dynamics.

This first Wales-level assessment of bullhead classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: NRW



Distribution map for S6965

Range map for S6965

S6965 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 2,249

Population size in National Site Network: 848

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Uncertain

S6965 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

5.4 Mollusc species

Image credit: Roy Anderson

S1013 Geyer's whorl snail

S1014 Narrow-mouthed whorl snail

S1016 Desmoulin's whorl snail

S1029 Freshwater pearl mussel

S1013 Geyer's whorl snail (*Vertigo geyeri*)

Geyer's whorl snail (*Vertigo geyeri*) has a fragmented, relict distribution in the British Isles, with scattered populations in Scotland, northern England, north-west Wales and Ireland where it is mostly associated with open, calcareous seepages and flushes. These are narrow and highly vulnerable ecotones which are impacted by changes in grazing or hydrology, particularly as occupied seepages are often no more than a few square metres in area. For further information on Geyer's whorl snail, see the JNCC species account https://sac.jncc.gov.uk/species/S1013/.

In Wales, Geyer's whorl snail has been recorded from three localities – Cors Geirch Site of Special Scientific Interest/National Nature Reserve (SSSI/NNR), Cors Eddreiniog SSSI/NNR and Waun Eurad SSSI – in open, sedge-rich seepages typically with tussocks of black bog-rush. Since 2008, it has been recorded from just Waun Eurad and is now considered extinct at the other sites following recent extensive searches. The population on Waun Eurad is small, with a total of 66 shells recorded in November 2021.

Pressures include both undergrazing and overgrazing, abandonment of traditional grassland management, and pollution from agricultural activities. Hydrological pressures include modification of water flows and perhaps small-scale water abstraction. Climate-related pressures include temperature and precipitation changes, drought and degradation of habitat due to climate change.

Conservation actions include efforts to establish appropriate grazing regimes to maintain open seepages and avoid both undergrazing and overgrazing. The impact of hydrological changes is currently under investigation at Waun Eurad. A reintroduction to Cors Erddreiniog is being considered as part of the Natur am Byth! Project.

With the species now restricted in Wales to a single small locality which supports just 6,250 square metres of suitable habitat, the future prospects for Geyer's whorl snail are very poor. Whilst Waun Eurad does have statutory protection, this has not prevented the extirpation of the snail from its other Welsh localities. Recent summer droughts will have had an adverse impact upon the remaining population.

This first Wales-level assessment of Geyer's whorl snail classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

ANNEX II

Credit: Roy Anderson

Distribution map for S1013

Range map for S1013

S1013 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 1

Population size in National Site Network: 1

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1013 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1014 Narrow-mouthed whorl snail (*Vertigo angustior*)

The Narrow-mouthed whorl snail (*Vertigo angustior*) was widespread in open, lowland landscapes in the UK at the beginning of the Postglacial period but now shows a fragmented, relict distribution. Populations are currently restricted to coastal and inland sites in East Anglia, the Gait Barrows area of northern Lancashire and Cumbria, the Solway Firth in south-west Scotland, sites near Aberdeen, the North Antrim coast in Northern Ireland and three dune systems on Gower and in Carmarthenshire. The snail inhabits base-rich, free-draining moist places which are rarely affected by periodic desiccation or flooding, occupying warm, open, short vegetation of grasses, mosses and low herbs where it grazes on micro-fungi and algae on dead vegetation close to the ground. Habitats include salt-marsh transition zones, limestone pavements, inland marshy grassland sand dune grassland. For further information on Narrow-mouthed whorl snail see the JNCC species account https://sac.jncc.gov.uk/species/S1014/.

In Wales, it is found in mature dune slacks, dry dune habitats, and dune-saltmarsh transition zones on Nicholaston & Oxwich Burrows, Pembrey Coast & Forest and Whiteford Burrows. It is absent from Laugharne-Pendine Burrows, Llangennith Burrows, Swansea Burrows and Three Cliffs Bay.

Its habitat often consists of small and narrow strips, with some areas only 50 cm wide and 50–200 m long. There are 15 occupied monads (1 x 1 km squares) since 2006: 8 on Pembrey, 4 on Whiteford, 2 on Oxwich, and 1 on Nicholaston. Recent surveys on Whiteford Burrows have highlighted a more widespread distribution than previously appreciated. Populations on Pembrey, Nicholaston and Oxwich are small and sub-populations have been lost to succession and scrub encroachment.

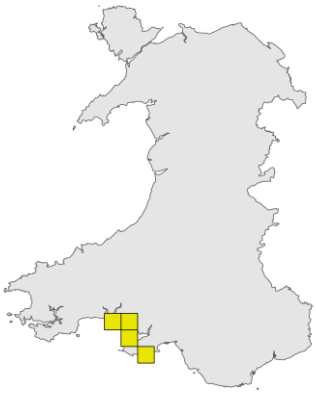
The main pressures affecting the snail are linked to natural succession and grazing intensity, with both undergrazing and overgrazing potentially degrading habitat quality. Abandonment of traditional land management and agricultural drainage further threaten its habitats. Flooding may lead to habitat loss at Whiteford Burrows and in Pembrey Forest. Climate change-related threats include temperature extremes, altered precipitation patterns and summer drought, sea-level rise, and changes to habitat location, size and quality.

Conservation efforts have focused on maintaining suitable grazing levels on Whiteford Burrows. Scrub clearance is being undertaken on Oxwich Burrows to restore the dune-saltmarsh transition. In Pembrey Forest, measures required include scrub removal and mowing to re-establish open, pioneer conditions.

This first Wales-level assessment of Narrow-mouthed whorl snail classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation, despite its wider distribution on Whiteford Burrows.

ANNEX II

Credit: Roy Anderson



Distribution map for S1014

Range map for S1014

S1014 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 15

Population size in National Site Network: 5

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1014 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unknown (XX)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1016 Desmoulin's whorl snail (*Vertigo moulinsiana*)

In the UK, Desmoulin's whorl snail (*Vertigo moulinsiana*) is mainly associated with lowland, base-rich swamps, fens and marshes bordering rivers, canals, lakes and ponds. It generally requires a tall vegetation structure and a stable hydrogeology, where the water-table is at, or slightly above, the ground surface for much of the year and any seasonal flooding is of very low amplitude. In the summer and autumn, the snails climb tall vegetation, but aestivate on the lower leaves of plants in severe conditions. They descend to the litter level and become less active over the winter period. For further information on Desmoulin's whorl snail, see the JNCC species account https://sac.jncc.gov.uk/species/S1016/.

The snail was first recorded in Wales on Cors Geirch Site of Special Scientific Interest (SSSI) in 1998, with subsequent records from Afon Penrhos floodplain in 2002 and Rhos Goch SSSI in 2007. Four occupied monads (1 x 1 km squares) have been recorded since 1998 across these three sites in two hectads: two on Cors Geirch, one on Rhos Goch, and one on Afon Penrhos floodplain. Recent records on Cors Geirch are limited to a single monad.

Ongoing and likely future pressures include cessation or overuse of grazing, mowing and drainage of agricultural land. Climate-related threats include changes in temperature, precipitation and habitat quality, and summer drought. Other threats include pollution from agriculture, water abstraction, and unregulated natural processes.

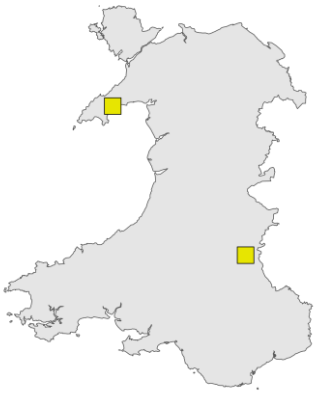
Conservation work on Cors Geirch and Rhos Goch has included scrub clearance to maintain open fen habitat. Control of grazing may also be needed at Cors Geirch. The Afon Penrhos floodplain, lacking statutory protection, remains vulnerable to agricultural and hydrological changes.

The Cors Geirch population has declined sharply since 2008 and has not recovered, with continued low counts across multiple surveys. Population size can vary considerably from year to year due to habitat changes, vegetation, humidity, and hydrology, making trends difficult to determine. However, low counts from 2016 to 2019 suggest a significant decline at this locality. The Rhos Goch population is expected to remain stable if water levels are maintained and scrub is managed.

This first Wales-level assessment of Desmoulin's whorl snail classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

ANNEX II

Credit: Roy Anderson



Distribution map for S1016

Range map for S1016

S1016 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 4

Population size in National Site Network: 2

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1016 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-bad (U2)

Habitat status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1029 Freshwater pearl mussel (*Margaritifera margaritifera*)

ANNEX II, V

Freshwater pearl mussel (*Margaritifera margaritifera*) is a large bivalve found in low nutrient, running waters. Adults filter feed and may live for over a century. Their life cycle includes a short parasitic stage on the gills of juvenile trout or salmon, after which juveniles live buried in clean gravel or sand for around five years before beginning to filter feed. For further information on Freshwater pearl mussel, see the JNCC species account https://sac.jncc.gov.uk/species/S1029/.

Pearl mussel was formerly widespread in Wales but is now Critically Endangered. Remaining populations are small, fragmented, and likely number fewer than 1,500 individuals in total. Recent surveys confirm presence and absence across several locations, with only 10.3% of the favourable reference value occupied.

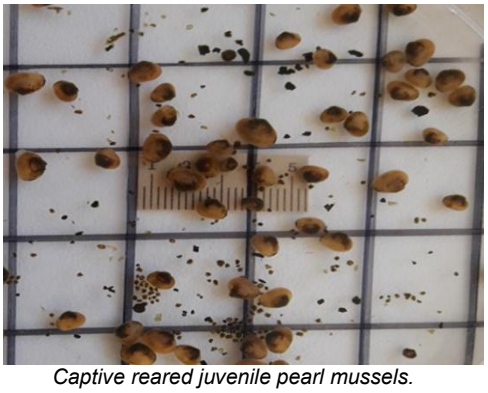
Since 2019, a loss of 19 one-kilometre squares represents a 25% decline by this metric, equivalent to an annual population decline of approximately 4%. This is driven by a lack of recruitment, as juvenile mussels are either washed out of the river or smothered by siltation in gravels.

Key pressures include morphological changes from historic dredging and land drainage that destabilises substrates and clog gravels. Forestry activities contribute moderately through water pollution and hydromorphological effects. Climate change poses increased risks through storm-induced flooding and drought-induced low flows. Though current illegal pearl fishing is absent, a residual low threat remains.

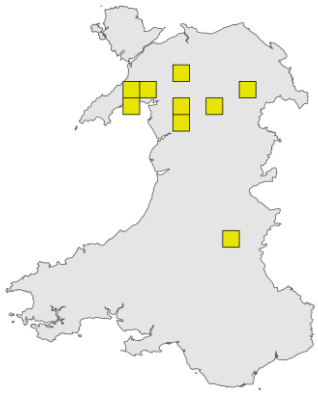
Without targeted conservation, extinction in Wales is projected within two decades. The national strategy combines habitat restoration and captive rearing to reverse declines. Although short-term range and population losses are likely, long-term success depends on effective strategy implementation and improved land management. Positive trends are beginning to emerge, but continued monitoring and intervention are critical.

Conservation action is delivered via a Strategy that combines habitat restoration with captive rearing and release. Projects such as Pearls in Peril, LIFEDeeRiver, and 4Rivers4LIFE are restoring habitats. Work includes fencing, sediment traps, gravel and boulder replacement. Captive rearing occurs at hatcheries in Powys and Cumbria, with juvenile mussels being reintroduced under controlled conditions starting in 2024.

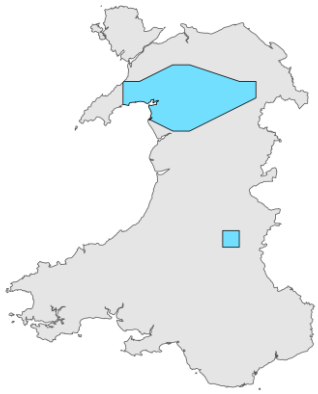
This first Wales-level assessment of Freshwater pearl mussel classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.



Captive reared juvenile pearl mussels. Credit:John Taylor, NRW



Distribution map for S1029



Range map for S1029

S1029 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 59

Population size in National Site Network: 22

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Unknown

S1029 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

5.5 Non-vascular plant species

Image credit : Sam Bosanquet, NRW

S1378 *Cladonia* subgenus *Cladina* subgenus of lichens

S1395 Petalwort

S1400 Large white-moss

S1409 Bog-mosses

S6216 Slender green feather-moss

S1378 *Cladonia* subgenus *Cladina* subgenus of lichens

ANNEX V

Cladonia 'subgenus *Cladina*' is a group of lichens that form intricately branched mats of podetia, often referred to as 'reindeer-moss lichens'. These lichens were once considered a separate genus but are now understood to have independently evolved similar growth forms within the monophyletic genus Cladonia. Five species—*Cladonia arbuscula, C. ciliata, C. portentosa, C. rangiferina and C. stygia*—are present in Wales. They all grow on the ground, mainly in heathland and peatland habitats.

The distribution map includes records since 1990, with the most recent data from 2017. Squares with only pre-1990 records, located in Glamorgan, Pembrokeshire, Ynys Môn and Clwyd, may have lost populations due to habitat loss and air pollution. A maximum potential distribution includes 171 10km squares, though the more realistic figure based on post-1990 data is 118 squares.

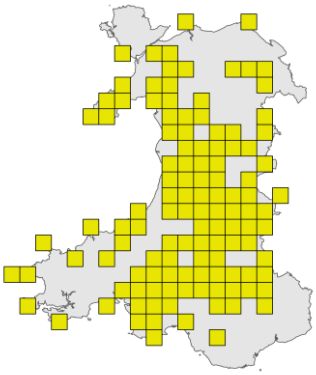
The main pressures on *Cladonia* subgenus *Cladina* include habitat loss and air pollution. Abandonment of traditional land management, such as cessation of grazing and mowing, is causing the closing over of habitats where *Cladonia* grows. Air pollution results from both agricultural and industrial activities. Loss and degradation of peatland and heathland habitats have also been noted due to these factors.

Conservation measures include preventing the conversion of natural and semi-natural habitats, and reducing air pollution from both agriculture and industry. Some actions are part of broader legislative frameworks, including measures under the Sustainable Farming Scheme. Localised restoration efforts such as peatland rewetting and reintroduction of grazing are ongoing, including projects like the LIFE Welsh Raised Bogs project. Efforts to reduce nitrogen pollution from transport may also provide localised benefits to *Cladonia* habitats.

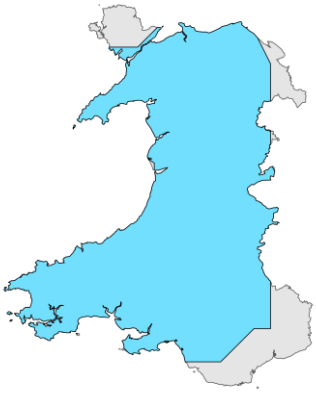
There is no evidence of harvesting of *Cladonia* subgenus *Cladina* in Wales. Despite existing conservation measures, air pollution remains a major threat, with only moderate confidence that these measures will sufficiently control it. Theoretically, interventions to protect heathland and peatland habitats could help mitigate some losses. However, future prospects for the species in Wales are considered poor.

This first Wales-level assessment of *Cladonia* subgenus *Cladina* subgenus of lichens classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall habitat species in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Unknown.

Credit: Sam Bosanquet, NRW



Distribution map for S1378



Range map for S1378

S1378 Species population and short-term trends

Population size unit: number of map 10x10 km grid cells

Population size: 118

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1378 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1395 Petalwort (*Petalophyllum ralfsii*)

ANNEX II

Petalwort (*Petalophyllum ralfsii*) grows in early successional habitats within calcareous, low-lying, seasonally flooded slack areas of coastal dune systems. It has been observed in 19 dune systems around the Welsh coast and was also introduced temporarily at an inland site. The inland colony persisted for less than five years. While most current colonies occur within UK National Site Network sites, some of these colonies have still been lost within the past ten years. For further information on Petalwort see the JNCC species account https://sac.jncc.gov.uk/species/S1395/.

Petalwort has been recorded in eight dune systems during the current reporting round: Aberffraw, Brownslade Burrows, Laugharne Burrows, Merthyr Mawr, Morfa Dyffryn, Newborough Warren, Pendine Burrows, and Ynyslas. Populations are stable or increasing at five of these locations. Talacre Warren is assumed to still support the species, while its status at Broomhill Burrows is uncertain and potentially lost. Between 2013–2018 and 2019–2024, the number of occupied localities declined from 13 to 10, with an estimated 23% to 38% decline in occupied localities and a reduction in grid cell occupancy from 21 to 16.

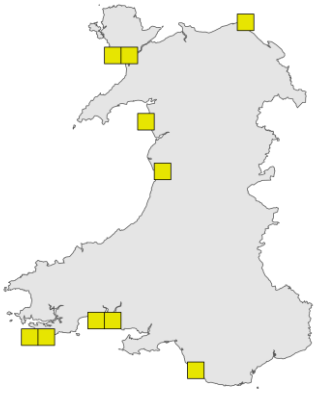
Primary pressures include under-grazing leading to natural succession, and widespread air pollution. Atmospheric nitrogen deposition affects 100% of Welsh habitat for the species. Invasive species, particularly *Hippophae*, present issues at several sites. Forestry-related activities have reduced water levels, notably at Newborough Warren, and sand dredging has impacted dune mobility. Although impacts from golf courses and sea defences have diminished, they caused historic losses of colonies. Groundwater abstraction and climate-driven changes in precipitation further alter dune slack dynamics and vegetation structure.

All UK National Site Network sites with Petalwort have undergone dune management to enhance early successional habitats, including actions under the Sands of LIFE Programme. Invasive species control has been conducted by Sands of LIFE and partners, as has dune destabilisation through excavation and scraping. NRW regulates air pollution and agricultural emissions. Military operations have been adjusted at two sites, which now support increasing populations of the species.

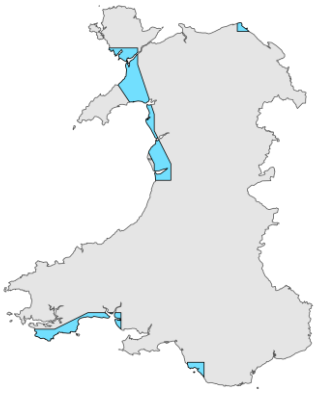
Despite large-scale conservation efforts, Petalwort continues to decline in Wales in terms of site occupancy, grid cell coverage, and individual abundance. Deterioration in habitat quality persists, and colonisation of new habitats is limited, particularly within the National Site Network. Although new scrapes have been created and one has supported Petalwort for at least five years, broader recovery is not yet evident. Confidence in the future outlook is low due to these uncertainties, and ongoing declines could lead to further losses without effective restoration.

This first Wales-level assessment of Petalwort classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Sam Bosanquet, NRW



Distribution map for S1395



Range map for S1395

S1395 Species population and short-term trends

Population size unit: number of localities

Population size: 10

Population size in National Site Network: 8

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1395 Favourable conservation status and trend

Range status: Unfavourable-inadequate (U1)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1400 Large white-moss (*Leucobryum glaucum*)

Large White Moss (*Leucobryum glaucum*) is primarily found in heathland and bog habitats in Wales, with fewer occurrences in woodland. The species is widespread across the country, with the highest concentrations in the north and west. Although two similar species exist in woodland settings, this summary pertains only to Large White-moss. Harvesting of *Leucobryum* in woodland may impact related species not covered here.

In Wales, the species is distributed across at least 94 10x10 km squares with post-2000 records, based on data from the British Bryological Society. This distribution may under-represent the actual population, as many areas have not been surveyed since before 1990. Records made between 2000 and 2018 are included to compensate for under-surveying since 2019. Older records from pre-2000 were excluded due to possible local extinction from habitat loss and air pollution, especially in eastern Wales and Llŷn.

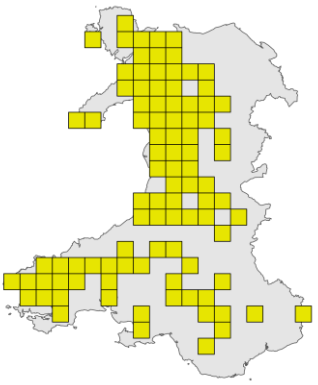
The main pressures on Large White-moss include air pollution and habitat degradation. High-impact pressures involve the removal of grazing from peatland and heathland, afforestation of these habitats, and agricultural and industrial air pollution. Additional moderate or localised pressures include burning for agriculture, peat extraction (now suspended), wind turbine development, road traffic pollution, and housing development. While commercial harvesting is not considered a pressure in Wales, the species remains vulnerable to environmental and land-use changes.

Current conservation measures include legal protections for Priority Habitats under UK and Welsh law, which help to safeguard habitats supporting Large White-moss. Air pollution reduction from industry is partly effective, while measures addressing agricultural emissions are planned under the Sustainable Farming Scheme. Localised benefits are arising from efforts to restore grazing and peatland hydrology, such as through the LIFE Welsh Raised Bogs project. Pollution control measures targeting transport may offer some additional local benefit.

Despite legal protections and targeted interventions, the future outlook for Large White-moss in Wales remains poor. The species continues to face significant habitat and pollution pressures. While habitat loss is the primary threat, confidence in the effectiveness of current and planned control measures is only moderate. Although the species' range remains broadly stable, population levels are slightly declining, and habitat quality has deteriorated.

This first Wales-level assessment of Large white-moss classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Unknown.

Credit: Sam Bosanquet, NRW



Distribution map for S1400

Range map for S1400

S1400 Species population and short-term trends

Population size unit: no. of map 10x10 km grid cells

Population size: 94

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1400 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1409 Bog-mosses (*Sphagnum sp.*)

Sphagnum mosses have a broad ecological tolerance across Wales, occupying wet, neutral to base-poor habitats. They are major components of bog, wet heath, and poor-fen ecosystems, and also occur in base-poor and neutral flush communities, marshy grasslands, wet woodland, and Celtic Rainforest. Some species are rare, while others are relatively common. The group's overall range is shaped by the distribution of the more widespread species.

Sphagnum occurs in 224 10x10 km squares in Wales based on all post-1990 records. The smallest plausible population is 197 squares with records from post-2000, and the largest possible includes 231 squares if pre-1990 records still reflect extant colonies. The current map includes records from 2000–2024, as many populations recorded before 2019 are likely still extant.

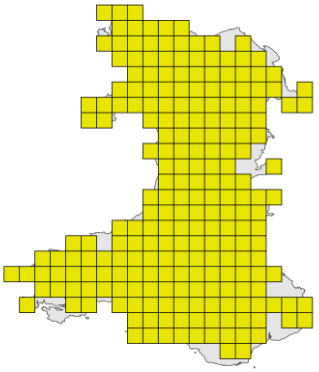
Ongoing and likely future pressures on *Sphagnum* include abandonment of traditional management such as grazing and mowing, overgrazing, and undergrazing. Agricultural practices contribute significantly through burning, nutrient and air pollution, and drainage. Afforestation and peat extraction have also impacted the species group, although peat extraction has been suspended. Other more minor pressures include pollution from transport and residential or industrial activities, as well as projected impacts of climate change. Although some *Sphagnum* is collected during moss harvesting, this is believed to be a minor pressure

Key conservation measures include preventing conversion of natural habitats, reinstating appropriate grazing and burning practices, and reducing pollution from agriculture and industry. Controlling drainage and restoring hydrologically altered habitats are also major components. Some actions are incorporated into UK and Welsh legislation, and projects like the LIFE Welsh Raised Bogs initiative are providing localised benefits. Plans under the Sustainable Farming Scheme aim to reduce nitrogen pollution from agriculture, which remains an urgent need.

Despite limited commercial harvesting, which focuses on common species, significant pressures continue to affect *Sphagnum* and its habitats. Air pollution is a confirmed cause of damage, but confidence in the effectiveness of control measures is moderate. Control measures for peatland and heathland degradation should prevent the direct loss of colonies, so air pollution remains the primary threat. Future prospects for the group in Wales are currently poor, with uncertainty surrounding implementation of necessary controls.

This first Wales-level assessment of Bog-mosses classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Sam Bosanquet, NRW



Distribution map for S1409

Range map for S1409

S1409 Species population and short-term trends

Population size unit: no. of map 10x10 km grid cells

Population size: 224

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1409 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S6216 Slender green feather-moss (*Hamatocaulis vernicosus*)

ANNEX II

Slender green feather-moss (*Hamatocaulis vernicosus*) occurs in springs, flushes, and mires with neutral pH water. Most colonies in Wales are located in unenclosed uplands between 200 m and 400 m altitude, though records exist up to 620 m in south Wales. British specimens belong to one genetically distinct European lineage. The species is widespread in northern Eurasia and North America, making the Welsh populations relatively insignificant in European and global terms. For further information on slender green feather- moss, see the JNCC species account https://sac.jncc.gov.uk/species/S1393/.

The best estimate of the population in wales is 147 occupied 1x1 km squares, based on records from 2001 to 2024. An absolute minimum population of 34 1x1 km squares was recorded during 2019–2024, but this is considered a significant under-representation. Only 16 of the 53 recorded 10x10 km squares have been revisited in the current reporting period. The overall short-term trend is considered stable, with limited monitoring showing small changes in recorded 1 km grid units.

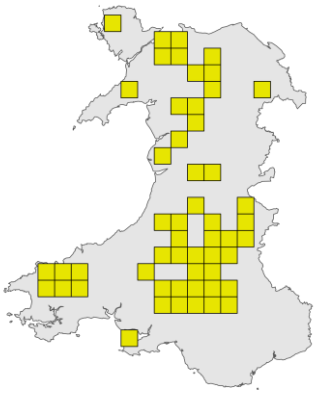
The principal threat to the species is loss of habitat quality, primarily due to undergrazing and abandonment of land management. Agricultural water and air pollution contribute to declines, facilitating growth of bulky native species. Hydropower and windfarm infrastructure threaten certain flushes, and military activity poses a risk in one mid Wales area. Drainage and afforestation are plausible but infrequent threats due to the species' localised distribution.

Conservation is supported by management on Sites of Special Scientific Interest (SSSIs), some within the UK National Site Network. Policies in Wales and across GB and the EU prevent conversion of semi-natural habitats to agriculture or forest, and address agricultural and non-agricultural pollution. Military cooperation is in place to reduce activity-related risks to a key colony. Nonetheless, abandonment remains a concern on many protected sites, and further habitat management is urgently required on some.

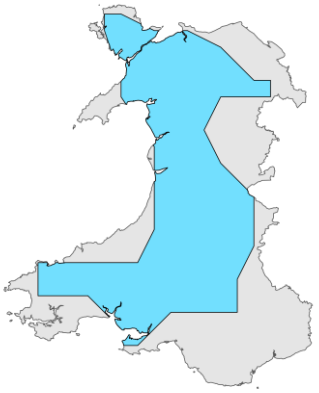
Slender green feather-moss populations are considered stable and largely protected where grazing is maintained and SSSI coverage exists. However, loss of grazing has caused habitat degradation in Mynydd Preseli Special Area of Conservation (SAC) and likely affects unsurveyed colonies outside protected areas. As modern agriculture typically avoids wetland grazing, continued agroecological support for grazing is essential for the species' long-term survival in Wales.

This first Wales-level assessment of slender green feather-moss classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Sam Bosanquet, NRW



Distribution map for S6216



Range map for S6216

S6216 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 147

Population size in National Site Network: 46

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Decreasing

S6216 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unknown (XX)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

5.6 Other invertebrate species

Image credit: Peter Jones

S1044 Southern damselfly

S1065 Marsh fritillary butterfly

S1083 Stag beetle

S1092 White-clawed crayfish

S1034 Medicinal leech

S1044 Southern damselfly (*Coenagrion mercuriale*)

ANNEX II

In the UK, the Southern damselfly (*Coenagrion mercuriale*) is restricted to sites in the New Forest, the Itchen and Test valleys in Hampshire, Purbeck in Dorset, Dartmoor and East Devon, Parsonage Moor in Oxfordshire and a handful of sites in Wales. It is associated with three distinct habitat types – heathland streams and runnels, chalk streams and calcareous fens. Breeding watercourses are shallow and unshaded, well-oxygenated, have a moderate flow and are spring- or groundwater-fed, thereby providing a constant temperature. Adults are weak flyers and poor dispersers, and females lay eggs on soft-stemmed aquatic plants such as Marsh St. John's-wort (*Hypericum elodes*), Bog pondweed (*Potamogeton polygonifolius*) and Fool's-water-cress (*Helosciadium nodiflorum*). For further information on Southern damselfly, see the JNCC species account https://sac.jncc.gov.uk/species/S1044/.

In Wales, Southern damselfly is now mostly restricted to Cefn Bryn Common, Rhossili Down and Clyne Common on Gower, Gweunydd Blaencleddau and Mynydd Preseli in Pembrokeshire, and Cors Erddreiniog on Anglesey. Since 2008, it has been recorded from 23 monads in 8 hectads, equating to seven populations across four SACs. It has been lost from Sluxton Marsh on Gower, may have become extinct at Waun Fawr, Puncheston in Pembrokeshire, and is in immediate danger of extirpation on Cors Erddreiniog due to a lack of suitable breeding habitat. Populations are declining on Cefn Bryn and Rhossili Down as runnels become unsuitable for breeding.

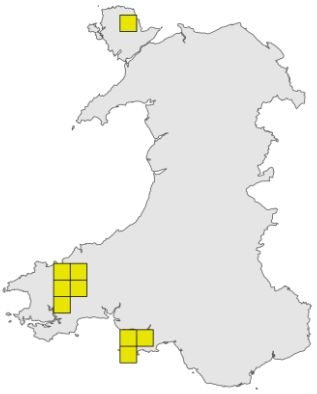
The main pressures include undergrazing and agricultural abandonment, which lead to natural succession that alters shallow, open streams and runnels. Additional threats involve changes in hydrology due to agricultural practices and climate change, such as water abstraction and altered precipitation regimes. These pressures contribute to long-term habitat deterioration and the loss of suitable breeding environments.

Restoration efforts have involved excavating overgrown runnels and reinstating grazing. Management actions have been undertaken by Pembrokeshire Coast National Park Authority, the British Dragonfly Society, Natural Resources Wales and the National Trust. Work on Cefn Bryn and Rhossili Down included ditch clearance and re-profiling, though in some cases, excavations were too deep to be effective. Despite these efforts, declines have not been reversed, and further targeted habitat restoration is needed on previously occupied runnels and seepages. More sympathetic management is being undertaken on Gower as part of the *Natur am Byth!* Programme.

The species has contracted to a few isolated sites and populations remain small and highly vulnerable due to poor dispersal capacity. Cors Erddreiniog is especially at risk, with low adult numbers and insufficient breeding habitat. Without regular, sympathetic habitat management across all sites, a slow, terminal decline is being witnessed. Current priorities include adopting management practices which maximise suitable breeding conditions and prevent further localised extirpations.

This first Wales-level assessment of Southern damselfly classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Peter Jones



Distribution map for S1044

Range map for S1044

S1044 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 23

Population size in National Site Network: 23

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1044 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1065 Marsh fritillary butterfly (*Euphydryas aurinia*)

ANNEX II

In Wales, the Marsh fritillary (*Euphydryas aurinia*) is typically associated with wet grasslands (rhôs) dominated by Purple Moor-grass, although it also inhabits dune slacks, fens, and limestone grasslands. Its larvae feed in groups on Devil's-bit scabious (*Succisa pratensis*) within larval webs, overwintering close to the ground in dense tussocks. The species persists as metapopulations – groups of separate populations connected by adult dispersal. To ensure long-term survival, between 76 and 104 hectares of suitable habitat are required within a defined landscape. For further information on Marsh fritillary butterfly, see the JNCC species account https://sac.jncc.gov.uk/species/S1065/.

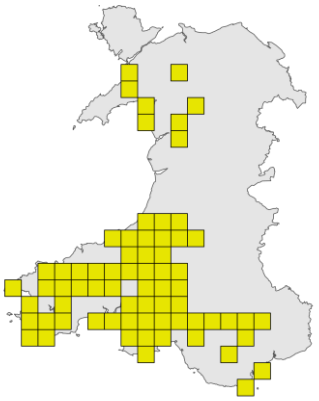
In Wales, the Marsh fritillary is a feature on thirteen Special Areas of Conservation (SACs) and 38 Sites of Special Scientific Interest (SSSIs), yet it has continued to decline. From 2013 to 2017, 132 populations were recorded across several vice-counties. An annual larval web survey in 2017 at 21 key sites found seven sites increasing, seven decreasing, and five stable, with zero counts at Morfa Harlech and Rhos Llawr Cwrt. Long-term data from the UK Butterfly Monitoring Scheme show a 61% abundance decline since 1990 and a 10-year trend of -46%. The Marsh fritillary has recently been lost from north Ceredigion and was last recorded on its remaining Anglesey site, Cors Erddreiniog, in 2020. Key threats to the Marsh fritillary in Wales include inappropriate grazing practices and agricultural drainage, leading to habitat degradation and an increasingly fragmented and disconnected landscape. A lack of habitat management results in vegetation succession and scrub encroachment. Urban development and infrastructure expansion in south Wales further fragment the landscape, isolating populations. Climate change also presents growing threats through altered precipitation and temperature patterns.

Current measures include landscape-scale projects addressing poor grazing and drainage issues, with targeted interventions in Carmarthenshire and Pembrokeshire. Management agreements are in place at many sites, and some unprotected areas have recently been designated as SSSIs. Legal protection under the Wildlife & Countryside Act and Section 7 of the Environment (Wales) Act supports planning considerations. Efforts such as habitat mapping, reintroductions, and engagement with landowners are also ongoing.

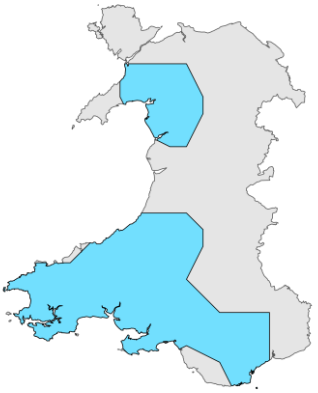
Despite these conservation actions, the outlook for the Marsh fritillary in Wales is poor. The species continues to decline across both SACs and SSSIs, with most sites too small and fragmented to support viable metapopulations. Key populations face threats from over-grazing, habitat loss, and development. Future success depends on prioritising habitat restoration and connectivity, rather than relying on reintroductions alone. Without comprehensive landscape-level improvements, most metapopulations are at risk of extinction.

This first Wales-level assessment of Marsh fritillary butterfly classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Adrian Fowles



Distribution map for S1065



Range map for S1065

S1065 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 377

Population size in National Site Network: 59

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1065 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1083 Stag beetle (*Lucanus cervus*)

ANNEX II

In the UK, the Stag beetle (*Lucanus cervus*) is found primarily in south-east England where it is associated with oak woodlands, parks, gardens and hedgerows. The larvae feed on underground rotting wood of old trees, stumps or buried deadwood. The larval stage lasts between three to six years before pupation, with adults typically active from May to August. For further information on Stag beetle see the JNCC species account https://sac.jncc.gov.uk/species/S1083/.

The species is at the edge of its UK range in south-east Wales, with sporadic records over the past century. Recent verified sightings include Slade Woods (1963), Whitchurch in Cardiff (1990s–2010), and Penallt in the Wye Valley (2012–2013). Since 2019, records have been made from 15 monads (1 x 1 km squares) in 13 hectads (10 x 10 km squares), mainly in Gwent and Glamorgan, with several near Cardiff and Monmouth, and an outlier in Talley, Carmarthenshire. There is a recent, unverified record from Gower.

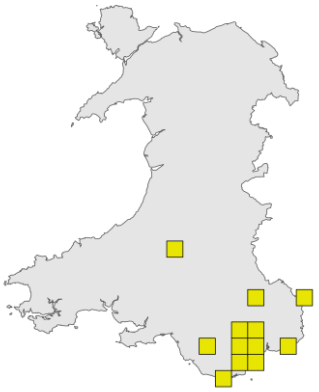
There is no current evidence of major pressures or threats to the species. The number of mature park and garden trees is expected to remain stable in the near future, although the threat of tree diseases such as ash dieback remains. Recent records from well-wooded areas suggest that subterranean decaying roots are likely present, though the habitat quality across post-2019 sites is unknown.

Cardiff County Council has coordinated surveys in collaboration with the People's Trust for Endangered Species. 'Bury buckets' simulating breeding substrates have been installed at five sites, although they have not been in place long enough to evaluate.

The Stag beetle is at the extreme edge of its UK distribution in Wales, where populations have been consistently small or absent. Habitat availability is likely sufficient due to the presence of submerged decaying tree roots in south-east Wales. Future persistence may depend on climate factors, with warmer summers potentially enabling population growth, especially if range expansion continues in southern England.

This first Wales-level assessment of Stag beetle classifies its overall conservation status as Unknown. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. An overall trend is not reported when the overall status is Unknown; the previous UK-level trend evaluation was Stable.

Credit: Steven Falk



Distribution map for S1083

Range map for S1083

S1083 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 15

Population size in National Site Network: 0

Range short-term trend: Unknown

Population short-term trend: Unknown

Habitat short-term trend: Unknown

S1083 Favourable conservation status and trend

Range status: Unknown (XX)

Population status: Unknown (XX)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unknown (XX)

Overall trend: NA

For full supporting evidence, see the searchable table of detailed reports.

S1092 White-clawed crayfish (*Austropotamobius pallipes*)

The White-clawed crayfish (*Austropotamobius pallipes*) is associated with base-rich freshwater habitats including streams, rivers, lakes and canals. It has an eastern distribution in Wales, historically widespread across easterly-draining rivers such as the Severn, Wye, and Usk. Small populations exist in several small rivers in south and south-east Wales, as well as in the Monmouthshire & Brecon Canal. Crayfish were introduced into rivers in Pembrokeshire in the 1980s and more recently to the Afon Taf Fawr. For further information on White-clawed crayfish, see the JNCC species account https://sac.jncc.gov.uk/species/S1092/.

In recent times, strong populations have been associated with several tributaries in the Wye system. Populations from some tributaries have been lost over the last 25–35 years. During the reporting period, there were records from 29 hectads (10 x 10 km squares) and 47 1 km squares, although this is considered an under-estimate due to lack of systematic recording.

The main pressure is from the non-native signal crayfish (*Pacifastacus leniusculus*), which aggressively outcompetes the native species, carries crayfish plague, and damages freshwater ecosystems. Other threats include heavy siltation from soil run-off and poaching by livestock, pollution from agriculture and forestry, and past localised extinctions from sheep dip spills. Signal crayfish continue to spread in the mid-Wye catchment and have been recorded in other parts of Wales such as the Severn catchment.

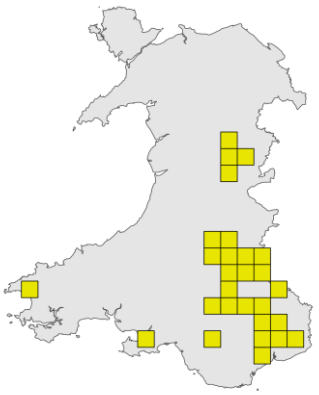
Livestock exclusion fencing has been implemented on several mid-Wye tributaries, benefiting crayfish populations by reducing siltation. A LIFE-funded project on the Irfon supported habitat improvement and released 5000 captive-reared crayfish into multiple tributaries, with evidence of wild progeny. Following the 2024 crayfish plague outbreak, biosecurity education and monitoring efforts were implemented. The use of synthetic pyrethroids in sheep dip was banned in 2006, leading to fewer crayfish kill incidents and improved invertebrate populations on the Irfon.

The unchecked spread of signal crayfish in the mid-Wye suggests a bleak outlook for native populations in the River Wye Special Area of Conservation (SAC). White-clawed crayfish persist in other Welsh rivers but are vulnerable to Signal crayfish colonisation, as seen in the Severn catchment. Targeted management is improving conditions in some catchments, and Ark Sites have been identified for future crayfish introductions using local donor stock.

This first Wales-level assessment of white-clawed crayfish classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

ANNEX II, V

Credit: Thomas Doherty-Bone



Distribution map for S1092

Range map for S1092

S1092 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 47

Population size in National Site Network: 8

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1092 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unfavourable-bad (U2)

Habitat status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1034 Medicinal leech (*Hirudo medicinalis*)

The Medicinal Leech (*Hirudo medicinalis*) is a blood-feeding aquatic species typically found in small ponds, ditches and flooded fens. It feeds on frogs, toads, mammals -particularly cattle and horses – and fish. In the UK, it is considered scarce, with only 20–30 isolated populations, although a large population exists in Romney Marsh, Kent.

In Wales, the leech has been recorded from about twenty water bodies on ten sites since 1990, all of which have statutory protection, with a notable concentration on the base-rich fens and ponds on Anglesey. Sites include Brechfa Pool, Cors Bodeilio, Cors Goch, Kenfig Pool, Marloes Mere, Newborough Forest & Warren, Pysgodlyn Mawr, Rhos y Gad and Talley Lakes, with a recent discovery at Pandora Reservoir in Gwydir Forest. While some populations are monitored regularly, there have been no recent systematic surveys and, as a consequence, there are no recent records from Marloes Mere, Pysgodlyn Mawr and Talley Lakes.

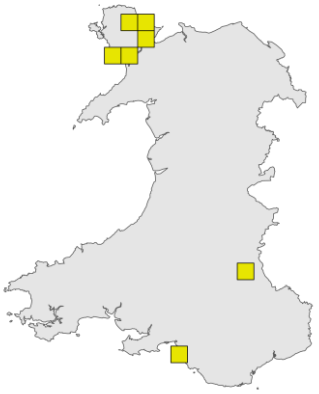
Over the last 27 years, it has occupied 11 monads (1 x 1 km squares) in 9 hectads (10 x 10 km squares) in Wales, with 7 monads in 6 hectads recorded since 2018. There is marked variation in population sizes at Welsh sites, ranging from fewer than 10 individuals at Kenfig Pool, Pysgodlyn Mawr, Talley Lakes and Rhos y Gad, to medium-sized populations (10–100) at Newborough Warren & Forest and Cors Goch, and hundreds at Cors Bodeilio, at least in 2016.

Climate change poses an immediate threat, with recent summer droughts resulting in the loss of occupied flooded fen and pools. As a result, the number of leeches recorded on Cors Bodeilio has declined sharply since 2021 with no noticeable recovery in wetter years. Summer droughts are expected to increase in frequency and negatively impact leech populations by drying key habitats. Additional pressures include water pollution and pesticide use, and fish stock management may have led to the extirpation of the leech population at Pysgodlyn Mawr. These pressures are ongoing and likely to continue affecting both protected sites and adjacent areas.

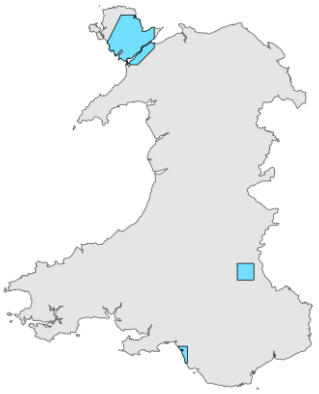
Recent conservation actions include pond deepening in Newborough Forest to prevent both habitat loss and population loss during prolonged dry periods, and the provision of additional pools on fen sites for stoneworts will have benefitted leech populations. The maintenance of high water tables on occupied Anglesey fens is critical to safeguarding Medicinal leech.

This first Wales-level assessment of Medicinal leech classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Improving.

Credit: Elis G. Roberts



Distribution map for S1034



Range map for S1034

S1034 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 11

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1034 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unknown (XX)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

5.7 Other mammal species

Image credit: Ian – stock.adobe.com

S1341 Common dormouse

S1355 Otter

S1357 Pine marten

S1358 Polecat

S1341 Common dormouse (*Muscardinus avellanarius*)

ANNEX IV

The Common (or Hazel) Dormouse (*Muscardinus avellanarius*) is most closely associated with ancient semi-natural woodland, especially hazel coppice, but is also found in early successional habitats including scrub and hedgerows. Dormice are present in some conifer woodlands, although their ecology in this habitat is not well understood. They require a habitat with a diverse species and structural composition to support their seasonal diet. They feed on flowers, buds, berries, nuts and invertebrates with oak, hazel, hawthorn, bramble and honeysuckle being of key importance. The availability of high energy food sources such as hazelnuts during autumn are key to ensuring dormice put on sufficient weight to hibernate over winter. Dormice generally occur at low densities compared with other small rodents primarily due to their specialised dietary needs.

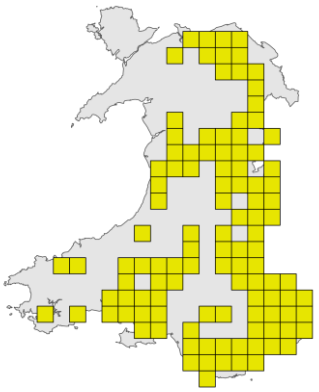
In the UK dormice are found in Wales and England, but are absent from Scotland. In Wales they are present in all counties except Anglesey and are most numerous in the southeast and more scarce in Gwynedd and Ceredigion. The National Dormouse Monitoring Programme was established in 1991 with the aim of monitoring changes in dormouse populations using data from dormouse nest box schemes in woodlands throughout England and Wales (Hazel dormice – People's Trust for Endangered Species). Results show an ongoing decline in dormouse populations across England and Wales. Between 1994 and 2020 dormouse populations in Wales are estimated to have declined by 89%.

Dormouse populations are impacted by climate change, habitat loss and fragmentation and reductions in woodland management. The loss of traditional woodland management, including coppicing, has led to woodlands with poorer structural and species diversity, but populations have also been impacted by an overall decline in woodland management. Hedgerow quality has also declined due to changes in agricultural practices. Development activities have the potential to impact dormice and their habitats. Warmer winters and more variable conditions as a result of climate change affects dormouse survival and reproduction.

Populations have been shown to fare better in areas with larger, connected woodlands and active habitat management. Conservation action requirements include improvements in habitat management to provide greater structural and species diversity. Advice for suitable woodland management is available and may be supported through grant funding. Mitigation measures are implemented to offset habitat loss from infrastructure developments. Climate change remains a significant threat, reinforcing the need for high-quality habitat to bolster resilience.

This first Wales-level assessment of Common Dormouse classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Unknown.

Credit: JRG – stock.adobe.com



Distribution map for S1341

Range map for S1341

S1341 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 815

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Decreasing

Habitat short-term trend: Unknown

S1341 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-bad (U2)

Habitat status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1355 Otter (*Lutra lutra*)

The European otter (*Lutra lutra*) is a top predator and an important biological indicator of the health of our rivers and wetlands. Otters are present in still and running freshwater systems, from coast to uplands, and are capable of long overland journeys. Although rarely observed due to their nocturnal nature, their presence can be identified through distinctive droppings (spraints) and footprints. Home ranges vary from 4km to 50km depending on prey availability and habitat. For further information on otter, see the JNCC species account https://sac.jncc.gov.uk/species/S1355/.

Otter populations in the UK are continuing to recover after the population crash in 1960-1980 caused by pesticides and industrial chemicals. In Wales almost complete recovery was found in the 5th Otter Survey of Wales (2009-10) with 90% of sites surveyed having signs of otter presence. A decline to 70% was reported in the 6th survey (2015-18), but changes in methodology, with greater reliance on less experienced surveyors, cast doubt on the validity of these findings. In the 7th survey (2024–2025) expert surveyors recorded otter presence at 93% of sites, suggesting that the otter population in Wales remains stable.

Otters are affected by activities that impact their resting, natal, foraging and commuting behaviours. Loss of foraging habitats and prey availability is a consequence of inappropriate development, coastal defence schemes and alterations to inland water bodies. Pollution from agricultural runoff, legacy pesticides, pharmaceuticals, and persistent chemicals like PFAS and rodenticides continue to add pressure to otter survival. Infrastructure such as roads contribute to mortality, though not yet at a level to affect the population.

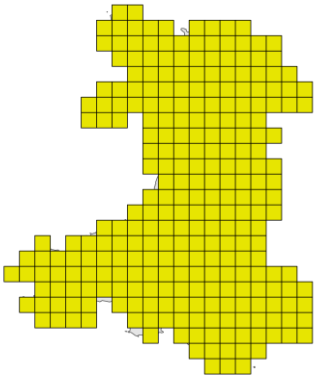
Water quality improvements through pollution monitoring and reduction, and river restoration have positively impacted otter populations. Road infrastructure planning includes provisions for safe crossing structures to mitigate habitat loss and fragmentation. Legal protection has supported the protection of habitats and breeding sites.

Future prospects for otters in Wales are currently considered stable. However, factors such as climate change present a potential future risk, with this likely to alter riparian and wetland habitats, affecting otters' prey availability and habitat quality. Loss of habitat connectivity due to man-made structures are a threat and will impede otter dispersal and territory establishment. Issues such as diffuse pollution, eutrophication and persistent chemicals remain and could have a negative effect on the otter population in Wales.

This first Wales-level assessment of otter classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

ANNEX II, IV

Credit: Ian – stock.adobe.com



Distribution map for S1355

Range map for S1355

S1355 Species population and short-term trends

Population size unit: number of individuals

Population size: 1,000

Population size in National Site Network: 300

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1355 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1357 Pine marten (*Martes martes*)

ANNEX V

The pine marten (*Martes martes*) is a generalist carnivore associated primarily with wooded habitats. Its diet is broad and seasonally variable, including small mammals such as voles, birds, insects, berries, and carrion. Although most abundant in woodlands they also make use of more open habitats such as heathland and foraging in woodland rides and rough grassland. Home range size can be variable ranging from 1km^2 to 30km^2 depending on the amount of woodland in the landscape.

Pine martens were historically widespread across Great Britain but suffered significant declines due to habitat loss and persecution, with remnant populations persisting in north Wales. As a result of this long-term decline, between 2015 and 2017, pine martens were translocated from Scotland to mid-Wales by the Vincent Wildlife Trust (VWT), to reinforce the remaining population. In addition, the Gwynedd Pine Marten project released a small number of captive-bred individuals between 2018 and 2020. The current estimated population in Wales is between 100 and 200 individuals. Population size is likely to continue to increase with the ongoing spread and establishment of pine martens from reintroduction areas.

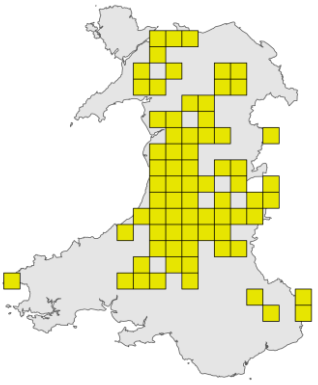
Key pressures include woodland management that can impact foraging and den site availability, especially the removal of dead and old trees, and mortality from road traffic accidents as their range expands. Low genetic diversity and competition with foxes have been suggested as past recovery limitations, although recent translocations have increased genetic variation.

Conservation actions include adapting forestry practices to support foraging and denning needs, such as retaining suitable trees and minimising disturbance during harvesting. Educational efforts aim to reduce illegal killing and accidental deaths during pest control. Den boxes have been deployed in woodlands to counter the shortage of natural cavities, although widespread implementation is required.

The VWT reinforcement project has significantly improved the pine marten's status in Wales, with established populations from Twyi forest to Coed y Brenin and sightings beyond. Although range is expected to expand as the population consolidates, it cannot be assumed in these early stages of the reinforcement project. Monitoring is vital to assess continued establishment and population expansion and the Martens on the Move project has established monitoring hubs within Wales.

This first Wales-level assessment of pine marten classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported a Favourable status, but this was largely a reflection of their status in Scotland at that time. The overall species trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

Credit: Dean Heward



Distribution map for S1357

Range map for S1357

S1357 Species population and short-term trends

Population size unit: number of individuals

Population size: 100

Population size in National Site Network: NA

Range short-term trend: Increasing

Population short-term trend: Increasing

Habitat short-term trend: Unknown

S1357 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unknown (XX)

Future prospects status: Favourable (FV)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1358 Polecat (*Mustela putorius*)

ANNEX V

The polecat (*Mustela putorius*) is a medium-sized carnivore associated primarily with farmed landscapes, although it occupies a wide range of habitats. Its diet is generalist, but rabbits can constitute a large part. Preferred habitats include woodland edges, field boundaries, and farm buildings, while open fields and suburban areas are least favoured. Unlike elsewhere in Europe, polecats in Britain do not favour riparian areas, most likely due to competition with mink and their preferred prey, rabbits, being abundant throughout their range.

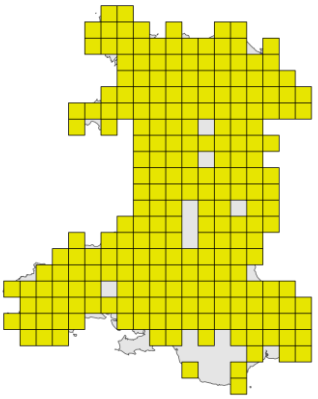
As with many other carnivores, polecat populations declined significantly during the 19th century and by 1915 polecats were largely absent from much of Britain. The exception to this was Wales, with mid-Wales remaining a stronghold. Populations gradually recovered during the 20th century spreading out of the mid-Wales area to recolonise much of their former range. By 2006, polecats were present in all counties of Wales, and a 2016 survey confirmed this range was maintained. The estimated Welsh population is 16,800 individuals, with a 95% confidence interval between 13,700 and 20,000. A new National Polecat Survey is currently underway (Vincent Wildlife Trust | National Polecat Survey (2024-2025)) but the results are not available for this report.

Probably the greatest threat to polecat populations are the effects of secondary poisoning by rodenticides. A study in 2018 showed a 1.7-fold increase in detection of secondary rodenticides over 25 years. Polecats actively avoid open habitats, and the removal of hedges and woodland edges reduces suitable habitat availability. Illegal persecution and accidental trapping, especially in Fenn and cage traps, remain threats. Hybridisation with feral ferrets remains an issue, though true polecats are most frequent in Wales compared to the rest of the UK. Road traffic mortality persists, though it does not appear to impact populations significantly.

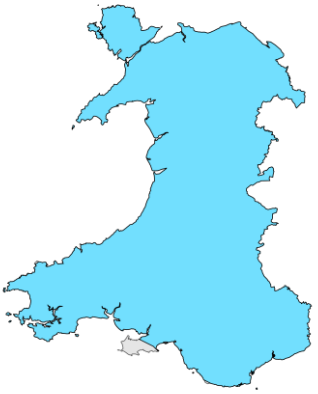
Polecat have been making positive, natural progress towards complete recovery in Wales. As a result, specific conservation actions are not currently considered necessary.

This first Wales-level assessment of Polecat classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

Credit: Mike Hammett



Distribution map for S1358



Range map for S1358

S1358 Species population and short-term trends

Population size unit: number of individuals

Population size: 16800

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1358 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

5.8 Vascular plant species

Image credit: Julian Woodman, NRW

S1413 Clubmosses

S1441 Shore dock

S1654 Early gentian

S1831 Floating water-plantain

S1849 Butcher’s broom

S1903 Fen orchid

S6985 Killarney fern

S1413 Clubmosses (*Lycopodium sp.*)

ANNEX V

The five Lycopodiaceae species considered in this assessment for Wales are alpine clubmoss (*Diphasiastrum alpinum*), stag's-horn clubmoss (*Lycopodium clavatum*), one-cone clubmoss (*Lycopodium lagopus*), fir clubmoss (*Huperzia selago*), and marsh clubmoss (*Lycopodiella inundata*). Habitat surveys for marsh clubmoss especially, in recent years, indicate a decline in the quality and extent of both occupied and nearby unoccupied habitats. This decline has been linked to a reduction in grazing management, and in at least one instance, habitat was actively damaged through drainage activities and other works.

In Wales, the distribution data for these species is derived from records within the Botanical Society of Britain & Ireland (BSBI) Distribution Database. Evidence of a short-term population decrease is available and is largely attributed to a reduction in the number of sites and populations of marsh clubmoss. The Alpine clubmoss shows some signs of distributional decline, although the causes and future trajectory of this trend are not known. Population prospects for the remaining species remain unclear.

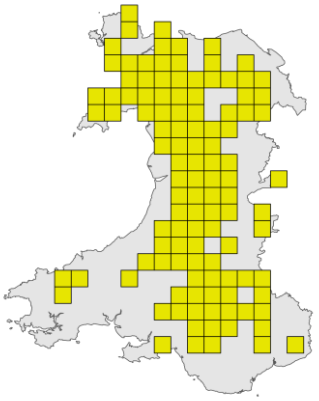
The main pressures on these species in Wales include land-use changes such as conversion to agricultural land and alterations between different agricultural types. Both abandonment and intensification of grazing are reported threats, as is agricultural drainage. Additionally, afforestation from other land uses is identified as an ongoing pressure. These threats are considered medium in severity and are expected to persist in the future.

Conservation measures identified currently focus entirely on marsh clubmoss. Proposed actions include restoring appropriate grazing regimes, modifying or preventing drainage, and improving hydrological conditions at all relevant sites - including those where the species may now be extinct. These measures also aim to avoid burning and promote extensive grazing. Management recommendations call for tailored agricultural practices, including mowing and the restoration of previously altered hydrological habitats.

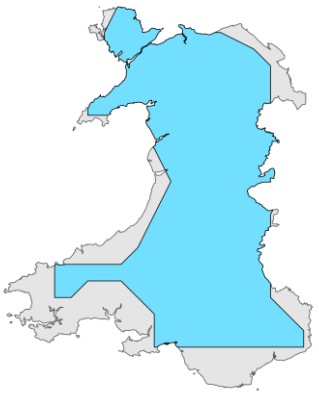
Future prospects vary between species. There is good confidence in the assessment for marsh clubmoss, with evidence of ongoing site and population degradation, particularly in North Wales within and near Eryri Site of Special Scientific Interest (SSSI). Without conservation intervention, these declines are likely to persist. Conversely, for the other four *Lycopodiaceae* species, the future outlook is uncertain due to insufficient data. Overall, no evidence suggests commercial collection of these species, although undocumented or informal collection cannot be entirely ruled out.

This first Wales-level assessment of Clubmosses classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Unknown.

Credit: Julian Woodman, NRW



Distribution map for S1413



Range map for S1413

S1413 Species population and short-term trends

Population size unit: number of map 10x10 km grid cells

Population size: 112

Population size in National Site Network: NA

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Uncertain

S1413 Favourable conservation status and trend

Range status: Unknown (XX)

Population status: Unknown (XX)

Habitat status: Unknown (XX)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1441 Shore dock (*Rumex rupestris*)

Shore dock (*Rumex rupestris*) in Wales occupies three primary habitats: cliff and cliff base areas typically with freshwater flushing, coastal shingle near cliffs, and bare sand in dune systems, especially in dune slacks. Currently, it is confined to two locations in Wales, in Pembrokeshire and Ynys Môn. It occurs in very small and fragmented habitats, including a single stable cliff site in Pembrokeshire and flushed rocks and sand within a dune system at Newborough. The species formerly occupied additional dune and cliff base sites, some of which have been lost due to natural disturbances. The dynamic pattern of colonisation and extinction across sites suggests a metapopulation structure influenced by seed dispersal via the sea. For further information on Shore dock, see the JNCC species account https://sac.jncc.gov.uk/species/S1441/.

The total Welsh population of Shore dock declined from 286 individuals in 2016–2017 to 158 in 2024. At Newborough, numbers dropped from 177 in 2016 to 36 in 2024. In Pembrokeshire, Watery Bay supported 122 individuals in 2024. Satellite populations at cliff base at Marloes were lost in 2013/14 storms. The Dunraven site in Glamorgan lost its final individuals between 2019 and 2021; a reintroduction attempt, further along the coast began in 2024 with 64 plug plants planted.

Main pressures include forestry activities affecting habitat at Newborough and agricultural nutrient input potentially impacting flushing sites. Cliff falls and storm damage have caused recent habitat loss and are expected to continue due to climate change. Low-level threats include hybridisation with other dock species and small population sizes. These pressures are anticipated to persist, with some management planned to improve habitat connectivity and reduce conifer cover at Newborough.

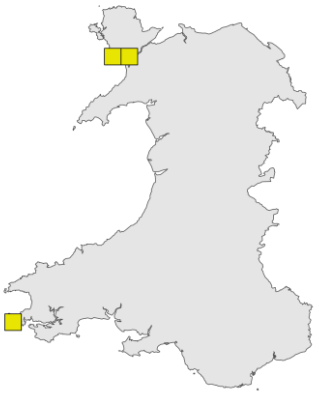
Conservation measures include forest management adjustments at Newborough, such as tree removal and streamside vegetation clearance, to maintain habitat. Habitat management through sand dune rejuvenation has been implemented at several sites, creating suitable conditions, though colonisation remains limited. A reintroduction effort was initiated at Southerndown following the loss at Dunraven Bay. Further habitat improvements and population support are planned under the Natur am Byth project.

The species remains vulnerable to stochastic events, with cliff sites at risk from storms and erosion. While re-colonisation is possible, it has not occurred recently. Newborough's population is reliant on active habitat management, and proposed interventions aim to improve viability. If Southerndown reintroductions succeed and Newborough habitat work continues, the species' range and resilience may improve, though threats from climate change persist.

This first Wales-level assessment of Shore dock classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Unknown.

ANNEX II, IV

Credit: Julian Woodman, NRW



Distribution map for S1441

Range map for S1441

S1441 Species population and short-term trends

Population size unit: number of individuals

Population size: 158

Population size in National Site Network: 158

Range short-term trend: Decreasing

Population short-term trend: Decreasing

Habitat short-term trend: Decreasing

S1441 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1654 Early gentian (*Gentianella amarella* ssp. *Anglica*)

ANNEX II, IV

Early gentian (*Gentianella amarella* ssp. *Anglica*) is endemic to Britain and almost entirely restricted to the chalk downland of southern England. In Wales, it is confined to a single location at Stackpole Warren in Pembrokeshire, where it occurs in dry slacks within a perched dune system overlying Carboniferous Limestone. The Welsh population represents a distinct outlier from the main UK populations in Dorset and Wiltshire. The taxonomic status of this subspecies has been debated, with recent studies placing it within the *amarella* group. For further information on early gentian, see the JNCC species account https://sac.jncc.gov.uk/species/S1654/.

Early gentian is recorded from only one 10 km square in Wales, at Stackpole National Nature Reserve, with the population still extant as confirmed in 2024. During the last comprehensive survey in 2015, 40 individuals were recorded at Stackpole. Estimates are complicated due to wide inter-annual abundance fluctuations and difficulties distinguishing this taxon from subsp. *Amarella*. There has been no detailed monitoring since 2015, although a brief 2024 visit Confirmed its presence with 80% identification confidence.

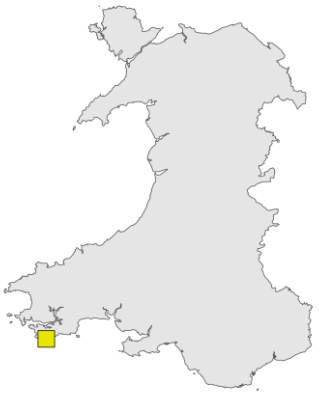
The habitat at Stackpole is threatened by under-grazing, atmospheric nitrogen deposition, and natural habitat succession, which encourage encroachment by coarse species. These issues are compounded by rabbit population declines due to disease, which reduces grazing pressure essential for maintaining suitable habitat. Excess nitrogen deposition surpasses critical loads for comparable habitats, likely accelerating succession and promoting nitrophilous species. Gentian populations also experience annual fluctuations driven by weather conditions, with future droughts and climate variability posing additional threats.

Key measures include managing grazing intensity and timing at Stackpole NNR to maintain habitat conditions, with priority given to managing bracken and coarse vegetation in dune hollows. Potential disease mitigation for local rabbits, such as vaccination, is planned at other sites and may be extended to Stackpole. National and local regulations aim to reduce atmospheric nitrogen and other pollutants. However, excess nitrogen, succession processes, and climate effects remain unresolved challenges despite ongoing habitat management efforts.

The range and distribution of the species in Wales are unlikely to change in the short to medium term. However, habitat change remains the principal threat to population viability at Stackpole, only partially addressed by current conservation measures. Habitat succession, intensified by atmospheric nitrogen, continues to endanger habitat condition and extent. While ongoing management may alleviate some impacts, it is unlikely to fully counteract these pressures, suggesting a probable population decline despite current interventions.

This first Wales-level assessment of early gentian classifies its overall conservation status as Unknown. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Unknown.

Credit: Karen Wilkinson, NRW



Distribution map for S1654

Range map for S1654

S1654 Species population and short-term trends

Population size unit: number of localities

Population size: 1

Population size in National Site Network: 1

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Uncertain

S1654 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unknown (XX)

Overall trend: NA

For full supporting evidence, see the searchable table of detailed reports.

S1831 Floating water-plantain (*Luronium natans*)

Floating water-plantain (*Luronium natans*) is an aquatic plant native to north-western Europe. It typically grows with strap-like submerged leaves forming from stoloniferous rosettes, occasionally producing floating leaves. In shallow water, it may also develop short-lived white or pink-tinged flowers during late summer. In Wales, it favours low to moderate alkalinity lakes, often with a peaty appearance, and is less commonly found in heathland pools, canals, or slow-flowing rivers. For further information on floating water-plantain, see the JNCC species account https://sac.jncc.gov.uk/species/S1831/.

Floating water-plantain is fairly widespread in Wales, with notable hotspots in Eryri, Ceredigion, and Pembrokeshire. It was recorded in 71 1km squares during 2014–2024, with 52 more interpolated or considered likely extant, totalling 123 squares. This represents 85% of the favourable reference number of 145 squares. While there are no confirmed losses since the last reporting round, uncertainty has increased due to data limitations, and population trend direction remains uncertain.

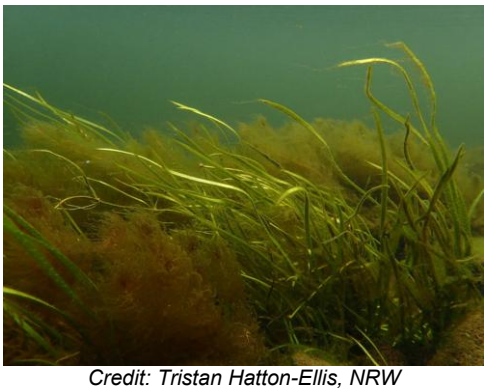
The species faces moderate pressures, primarily from nutrient enrichment, hydrological changes, and invasive species. In canals, boat movement stirs silt, increasing turbidity and harming aquatic vegetation. Invasive species such as *Elodea nuttallii* and *Crassula helmsii* threaten populations by outcompeting native plants, with notable impacts in Llyn Tegid and Montgomery Canal. Proposals to expand boating on the Montgomery Canal and undergrazing at sites like Dowrog Pool may also exacerbate pressures.

Conservation efforts include pollution control at key sites like Llyn Tegid and Montgomery Canal, transport management, and invasive species control. Natural Resources Wales collaborates with the Canal and Rivers Trust to address operational impacts on the Montgomery Canal. Invasive species management includes early detection, rapid response, and control where species are established. Two new pools have been created at Dowrog Common, though colonisation has not yet occurred and reintroduction may be needed.

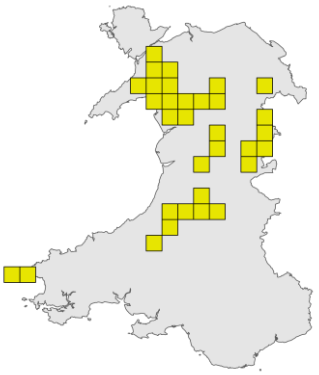
Wales is of global importance for floating water-plantain, particularly in upland lakes where populations are relatively secure. Populations in canals, rivers, and lowland pools face greater threats, especially from succession and invasive species. Maintenance challenges and proposals for increased canal boating could negatively impact key sites like the Montgomery Canal. Continued protection and management are essential, as without them, further declines in population, habitat quality, and range are likely.

This first Wales-level assessment of Floating water-plantain classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall species trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

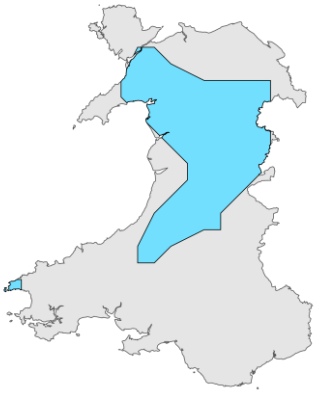
ANNEX II, IV



Credit: Tristan Hatton-Ellis, NRW



Distribution map for S1831



Range map for S1831

S1831 Species population and short-term trends

Population size unit: number of map 1x1 km grid cells

Population size: 123

Population size in National Site Network: 101

Range short-term trend: Stable

Population short-term trend: Uncertain

Habitat short-term trend: Decreasing

S1831 Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-inadequate (U1)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

S1849 Butcher's broom (*Ruscus aculeatus*)

Butcher's broom (*Ruscus aculeatus*) is a dioecious, evergreen shrub. It is relatively widespread in Wales but is considered native only at certain sites on the Gower peninsula. The native populations are confined to steep, unmanaged coastal woodlands, typically on limestone, where the environment remains naturally open due to wind-pruning and drought conditions. Within these native sites, the species is known to be fruiting and locally abundant.

In Wales, the native distribution of Butcher's broom is restricted to two 10 km² squares in the Gower. The total surface area occupied by these native populations is approximately 0.5 km², limited to coastal woodlands at Nicholaston and Oxwich. Outside these locations, the species is very widely naturalised, though not considered native. There is no evidence of decline in the South Gower populations.

There are no major current pressures identified for native populations of Butcher's broom in south Wales. The species appears to be regenerating naturally and is locally abundant. No commercial collecting occurs. While it is widespread as a garden escape, including in parts of Gower, this does not appear to impact native populations. A potential low-level threat is increased cliff erosion due to climate change, especially since many native populations are located on wooded cliffs.

The native sites of Butcher's broom have been notified as Sites of Special Scientific Interest (SSSIs), where the boundaries have been fully delineated through habitat surveys. Within these SSSIs, the species is considered widespread and locally abundant. Based on its presence and condition, the habitat has been judged to be in 'Good' condition. These protections and habitat assessments suggest active conservation oversight at key sites.

The'futu'e outlook for Butcher's broom in Wales appears positive. The species is nearly entirely restricted to protected sites in south Wales, where both its populations and habitat are regarded as secure. In the absence of significant threats, it is expected that both the species and its habitat will remain stable in the medium term. Confidence in this assessment is based on expert judgement and current trends.

This first Wales-level assessment of Butcher's broom classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Barry Stewart

Distribution map for S1849

Range map for S1849

S1849 Species population and short-term trends

Population size unit: number of map 10x10 km grid cells

Population size: 2

Population size in National Site Network: NA

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S1849 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1903 Fen orchid (*Liparis loeselii*)

In Wales, the Fen orchid (*Liparis loeselii*) occurs in dune slacks subject to winter flooding, often for up to five months annually. A high summer water table is also important. It grows in young dune slack communities where some open soil or sand remains, particularly in successional or orchid-rich slacks. The variety present in Wales is var. *ovata*. For further information on Fen orchid, see the JNCC species account https://sac.jncc.gov.uk/species/S1903/.

Fen orchid is currently known from Kenfig National Nature Reserve, Pendine Burrows, and Whiteford Burrows. It was formally known from several other dune systems in the past. In 2013 it was only found at Kenfig, where the population grew to 4,255 plants in 2019, dropped to 1,536 in 2022, and crashed to 111 in 2024. At Whiteford, 623 individuals were recorded in 2024 after reintroduction in 2015. Pendine saw the return of 7 individuals in 2022 after a 20-year absence; none were found in 2023 or 2024. The total count of individual plants in Wales in 2024 was 734, with an average of 1,257 from 2022 to 2024.

The main pressures include natural succession due to under-grazing and a lack of dune system dynamism, compounded by air pollution. Extreme fluctuations in flooding and drought are increasingly impacting mortality and flowering success. Groundwater abstraction has been suggested as a factor in lowered water levels at Kenfig. The invasive shrub Hippophae is problematic at Pembrey. All current pressures are expected to persist, and agricultural pollution may be an increasing threat.

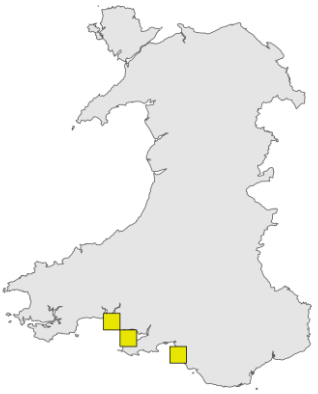
Conservation efforts include managing dune systems to increase mobility and create early successional habitats, particularly at Kenfig. Invasive species control has also been implemented. NRW regulates air pollution and agricultural pollutants and prevents dune afforestation. Plans to reinforce or reintroduce populations are under consideration, aligned with NRW's guidance on conservation translocations.

After a severe decline from over 20,000 individuals in the 1990s to fewer than 250 from 2003 to 2011, the fen orchid has shown recovery since 2012. Kenfig saw significant growth due to habitat management but suffered a crash in 2024, likely due to prolonged flooding. The Whiteford population has expanded steadily since reintroduction, supported by suitable moss-rich conditions and ongoing management. Pendine's population remains critically low. Wider recovery will require active habitat management and reintroduction plans aligned with IUCN and NRW guidance.

This first Wales-level assessment of Fen orchid classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall species trend in Wales is assessed as Improving, consistent with the previous UK-level evaluation.

ANNEX II, IV

Credit: Clive Hurford



Distribution map for S1903

Range map for S1903

S1903 Species population and short-term trends

Population size unit: number of individuals

Population size: (734-4,257)

Population size in National Site Network: (632-4,257)

Range short-term trend: Stable

Population short-term trend: Increasing

Habitat short-term trend: Increasing

S1903 Favourable conservation status and trend

Range status: Unfavourable-bad (U2)

Population status: Unfavourable-bad (U2)

Habitat status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-bad (U2)

Overall trend: Improving

For full supporting evidence, see the searchable table of detailed reports.

S6985 Killarney fern (*Vandenboschia speciosa*)

The Killarney fern (*Vandenboschia speciosa*) sporophyte occurs in constantly damp, shaded locations, typically on acidic but sometimes base-flushed rocks, and rarely on humic banks or as an epiphyte. It is found between 0 and 420 m in elevation. The gametophyte is more widespread, found in darker, drier situations, and likely under-recorded. For further information on Killarney fern, see the JNCC species account https://sac.jncc.gov.uk/species/S1421/.

The sporophyte is known from six locations in Wales and supports 17 discrete colonies. A total of just over 2200 live fronds have been recorded across all colonies during 2021–2025, with no change in extent or colony size since 2016–2017. The gametophyte has been recorded in 58 10km squares and is more widespread, though likely still under-recorded. The short-term population trend is considered stable, with no recent losses or gains in known sporophyte sites.

Current and future pressures include agricultural air pollution, hydropower developments, and mixed source water pollution. Forestry activities may alter shade and hydrology, affecting gametophyte habitats, while problematic native species are now considered a low pressure. Climate change, particularly changes in precipitation, poses a medium threat. At one site, fly-tipping and invasive non-native species are ongoing issues, with threats from potential slurry and sewage discharges. Collection is no longer considered a major threat.

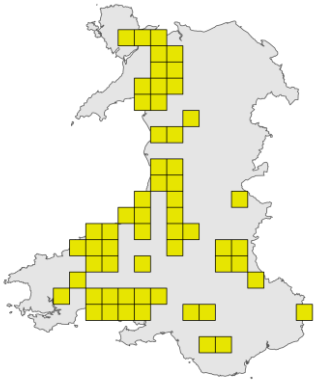
All six known sporophyte populations are within Special Areas of Conservation (SACs) or Sites of Special Scientific Interest (SSSIs), and at least 25% of gametophyte colonies receive similar protection. Forestry management has included removal of non-native conifers to improve habitat. Air pollution is managed by regulatory controls, though small emitters remain unregulated. Hydropower impacts are mitigated by regulation and site protection. Invasive species control has occurred at one site, with further action potentially required.

The overall outlook is reasonably positive due to limited threats and effective conservation measures. Sporophyte and gametophyte populations are protected under the Wildlife and Countryside Act. While the distribution of the gametophyte may expand with further survey, no significant range changes are expected. The sporophyte's small population size means it remains vulnerable to stochastic events such as frost or pollution incidents. Habitat and population trends are expected to remain stable.

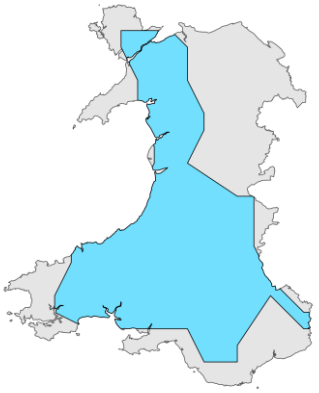
This first Wales-level assessment of Killarney fern classifies its overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall species trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

ANNEX II, IV

Credit: Julian Woodman, NRW



Distribution map for S6985



Range map for S6985

S6985 Species population and short-term trends

Population size unit: number of individuals

Population size: 17

Population size in National Site Network: 6

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Stable

S6985 Favourable conservation status and trend

Range status : Favourable (FV)

Population status : Favourable (FV)

Habitat status : Favourable (FV)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

5.9 Marine mammal species

We have provided Welsh summaries for:
S1349 Bottlenose dolphin (*Tursiops truncatus*) – Common
S1351 Harbour porpoise (*Phocoena phocoena*) - Common
S1364 Grey seal (*Halichoerus grypus*) - Common

These species are common in Welsh waters and are features of six Special Areas of Conservation in Wales. For bottlenose dolphin and harbour porpoise, regional Management Units (Mus) have been defined, and Welsh-level summaries have been provided accordingly.

Draft conclusions for Habitats Regulations Reporting (2019-2024) at management unit scale for bottlenose dolphin and harbour porpoise have been included within the technical appendices. These conclusions are indicative only, and were intended to help agencies add any nuance they feel is appropriate for country-level reporting. These assessments will not be published alongside official UK reporting. The guidance has been applied in the same way as for UK-level assessments. For both bottlenose dolphin and harbour porpoise, the corresponding UK-level assessments are also provided within the technical appendices for reference.

For other cetacean species commonly found in UK waters — including minke whale, white-beaked, white-sided, Risso's, and common dolphin —the relevant MU is the Celtic and Greater North Seas MU. Various lines of evidence suggest there is limited or no significant population structuring in these species in UK waters. No Wales-level assessment or summary has, therefore, been made for these or other common or rare marine mammal and marine turtle species usually found in Wales. Their populations and conservation status are better assessed at a broader spatial scales, and the UK level assessments available within the technical appendices are considered appropriate for these species.

Species for which UK-level assessments are considered appropriate include:
S1365 Common seal (*Phoca vitulina*) - Rare
S1350 Common dolphin (*Delphinus delphis*) - Common
S2027 Killer whale (*Orcinus orca*) - Rare
S2029 Long-finned pilot whale (*Globicephala melas*) - Rare
S2030 Risso's dolphin (*Grampus griseus*) - Common
S2618 Minke whale (*Balaenoptera acutorostrata*) - Common
S2621 Fin whale (*Balaenoptera physalus*) - Rare
S1345 Humpback whale (*Megaptera novaeangliae*) - Rare
S1223 Leatherback turtle (*Dermochelys coriacea*) - Rare

Cetacean species accounts, relevant to Wales, can also be found in in Evans & Waggitt 2023. For the common seal, please refer to Special Committee on Seals reports. For leatherback turtle, please refer to the annual strandings and sightings report from Marine Environmental Monitoring.

Other species which are considered to be vagrant in Welsh waters — meaning they occur infrequently or unpredictably — are not considered further, but species accounts are available at the UK level within the technical appendices. These include:
S2031 Atlantic white-sided dolphin (*Lagenorhynchus acutus*)
S2032 White-beaked dolphin (*Lagenorhynchus albirostris*)
S2034 Striped dolphin (*Stenella coeruleoalba*)
S2028 False killer whale (*Pseudorca crassidens*)

S2035 Cuvier’s beaked whale (*Ziphius cavirostris*)
S2038 Sowerby’s beaked whale (*Mesoplodon bidens*)
S2619 Sei whale (*Balaenoptera borealis*)
S2622 Pygmy sperm whale (*Kogia breviceps*)
S2624 Sperm whale (*Physeter macrocephalus*) (also known as catodon))
S5033 Northern bottlenose whale (*Hyperoodon ampullatus*)
S1224 Loggerhead turtle (*Caretta caretta*)
S1225 Hawksbill turtle (*Eretmochelys imbricata*)
S1226 Kemp’s ridley turtle (*Lepidochelys kempii*)
S1227 Green turtle (*Chelonia mydas*)

Species S2035 (Cuvier’s beaked whale) and S2038 (Sowerby’s beaked whale) are covered within the same technical appendix that addresses beaked whales more broadly. This appendix includes assessments for the following beaked whale species: S2625, S2035, S5034, S2038, S2037, and S5033, representing the family Ziphiidae.

Species considered absent from Welsh waters, and for which no further assessment or summary has been provided, include:

S1348 Northern right whale (Eubalaena glacialis)
S2037 True’s beaked whale (Mesoplodon mirus)
S2625 Blainville’s beaked whale (Mesoplodon densirostris)
S2626 Narwhal (Monodon monoceros)
S2637 Hooded Seal (Cystophora cristata)
S2638 Bearded Seal (Erignathus barbatus)
S2639 Harp Seal (Pagophilus groenlandicus)
S5020 Blue whale (Balaenoptera musculus)
S5023 Fraser’s dolphin (Lagenodelphis hosei)
S5029 Beluga (white whale) (Delphinapterus leucas)
S5034 Gervais’ beaked whale (Mesoplodon europaeus)
S6298 Melon-headed whale (Peponocephala electra)
S6305 Ringed Seal (Pusa hispida)

S1349 Bottlenose dolphin (*Tursiops truncatus*) in Wales

For further information on bottlenose dolphin (*Tursiops truncatus*), see the JNCC species account and the Atlas of cetaceans and seabirds in Wales.

The bottlenose dolphin species in Wales consist of two ecotypes: coastal and offshore. The coastal population is semi-resident in Cardigan Bay but ranges into the wider Irish Sea, especially during winter, and makes up the majority of the Irish Sea Management Unit (MU) with a minimum of 324 individuals (95% Confidence Interval (CI): 148-710). This is derived from a Capture Mark Recapture estimate in the monitoring time series of the wider Cardigan Bay. The offshore population occurs in the Celtic Sea and beyond, and is part of the Offshore Channel and South West England MU which has an estimated 15,210 dolphins (95% CI: 7,861-29,433) in the UK portion of that MU, residing mostly outside of Welsh territorial waters. This estimate is based on broadscale aerial surveys (SCANS IV, ObSERVE 2). Monitoring began in Cardigan Bay Special Area of Conservation (SAC) in 2001 and expanded to the wider bay in 2005. The population has remained stable over the long term (20+ years). The 2005 estimate of 205 individuals (95% CI: 98-429) in the wider bay has been used as the Favourable Reference Population, as this is when monitoring began.

Bottlenose dolphins face multiple pressures, particularly in coastal regions where there is greater exposure to human activity. These include disturbance from tourism and boats, pollution e.g. PCBs, and underwater noise from marine industrial and military activities and shipping. Other risks include collision with marine infrastructure and vessels. Effects are more likely to impact coastal populations due to their residency in these areas.

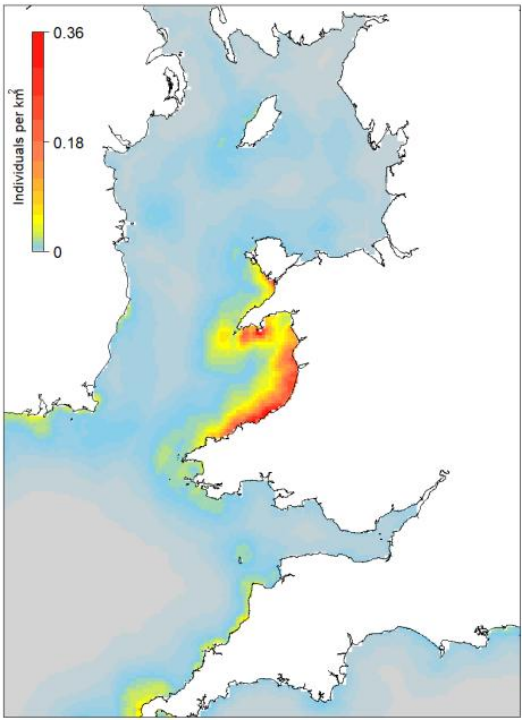
The UK implements several conservation measures, including legal protections under the Habitats Regulations, the Wildlife and Countryside Act, and international agreements. Bottlenose dolphin is a designated feature of two SACs in Wales: Cardigan Bay and Pen Llŷn a'r Sarnau. UK surveillance programs address cetacean bycatch and strandings. A national Marine Noise Registry tracks impulsive industrial noise, and mitigation guidelines are widely used to minimise harm from noise from geophysical surveys, piling, and explosives. The Welsh Government requires catch recording and vessel tracking on all fishing vessels and is developing Fisheries Management Plans that will consider interactions with bottlenose dolphins. The upcoming UK Cetacean Conservation Strategy will outline coordinated actions to support these efforts.

The population and range of bottlenose dolphins in Wales have remained stable since 2005. However, ongoing and emerging pressures are expected to persist, particularly for the coastal population, including disturbance, chemical pollution, and prey depletion from natural and anthropogenic causes. The combination of legal protection, ongoing monitoring, and targeted mitigation offers a structured framework to address these pressures into the future.

The Irish Sea MU assessment of bottlenose dolphin concludes the conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) reported the status as Unknown. The overall trend in the UK, MU and Wales is assessed as Stable.

ANNEX II, IV

Credit: NRW marine monitoring team



Distribution and density of bottlenose dolphin in Wales and adjacent sea. Source: Atlas of cetaceans and seabirds in Wales

S1349 (Irish sea MU) Species population and short-term trends

Population size unit: number of individuals

Population size: 324 (148-710)

Population size in National Site Network: 319 (158-727)

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Unknown

S1349 (Irish sea MU) Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unknown (XX)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1351 Harbour porpoise (*Phocoena phocoena*) in Wales

ANNEX II, IV

The harbour porpoise (*Phocoena phocoena*) is found throughout the UK continental shelf. It is common in Welsh waters, which forms part of the Celtic and Irish Seas Management Unit (MU). For further information on harbour porpoise see the JNCC species account and the Atlas of cetaceans and seabirds in Wales.

The number of harbour porpoise in Wales is unknown, but the best estimate for the population within the UK part of the Celtic and Irish Seas MU is 17,146 individuals (95% Confidence Interval (CI): 12,362-23,783), based on broadscale aerial surveys conducted in 2022 (SCANS IV, ObSERVE 2). Although the abundance of porpoise in the UK part of the MU has remained stable since 2016, there has been a notable decline at the scale of the whole MU since 2005. The Favourable Reference Population for the UK part of the MU is 42,622 (95% CI: 24,081-75,437) and was based on estimates from 2005 and 2007.

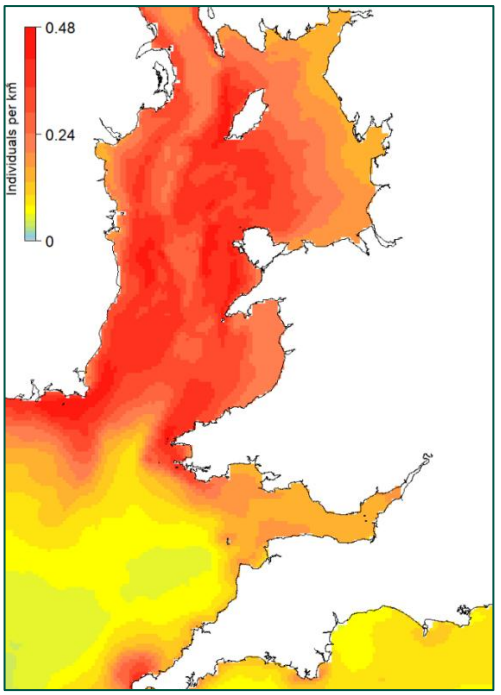
Harbour porpoise face multiple pressures in the MU which include bycatch from fishing, chemical pollution e.g. PCBs, and interactions with other marine species such as grey seal predation and bottlenose dolphin attacks. Bycatch remains the leading anthropogenic cause of death in the region, although it is thought to be minimal in Welsh waters. Additional threats involve prey depletion from natural and anthropogenic causes, and underwater noise from marine industrial and military activities and shipping.

The UK implements several conservation measures, including legal protections under the Habitats Regulations, the Wildlife and Countryside Act, and international agreements. In Welsh waters, there are three Special Areas of Conservation designated for the species (out of seven in the UK), which reflects their high densities in the MU. UK surveillance programs address cetacean bycatch and strandings. A national Marine Noise Registry tracks impulsive industrial noise, and mitigation guidelines are widely used to minimise harm from noise from geophysical surveys, piling, and explosives. The Welsh Government requires catch recording and vessel tracking on all fishing vessels and is developing Fisheries Management Plans that will consider bycatch and disturbance interactions with harbour porpoise. The upcoming UK Cetacean Conservation Strategy will outline coordinated actions to support these efforts.

The sustained decline in harbour porpoise numbers within the Celtic and Irish Seas MU is of concern and ongoing and emerging pressures are expected to persist. The combination of legal protection, fishery management and targeted mitigation, however, offers a structured framework to address these pressures into the future.

The Celtic and Irish Sea MU assessment of harbour porpoise concludes the conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported the status as Unknown. The overall trend in Conservation Status in the MU, and therefore Wales, is assessed as Stable.

Credit: Ken Barnett, Sea Trust Wales



Distribution and density of harbour porpoise in Wales and adjacent sea. Source: Atlas of cetaceans and seabirds in Wales

S1351 (UK portion of Celtic and Irish sea MU) Species population and short-term trends

Population size unit: number of individuals

Population size: 17,146 (12,362-23,783)

Population size in National Site Network: Not known

Range short-term trend: Stable

Population short-term trend: Stable

Habitat short-term trend: Unknown

S1351 (UK portion of Celtic and Irish sea MU) Favourable conservation status and trend

Range status: Favourable (FV)

Population status: Unfavourable-bad (U2)

Habitat status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1364 Grey seal (*Halichoerus grypus*) in Wales

For further information on grey seal (*Halichoerus grypus*), see the JNCC species account and Special Committee on Seals reports.

In 2022, the grey seal population in the UK was estimated to be 162,000 individuals (approximate 95% Confidence Interval: 146,700-178,500) – about 34% of the world's population. The number of grey seals in the UK has increased continuously since the 1990s and their range has remained stable. In Wales, an estimated 2,250 pups were born in 2020, suggesting a minimum total population of 5,220 seals. Aerial survey counts of seals hauled out on land in August 2023, support a similar population estimate. At monitored sites in Wales, pup production has increased since monitoring began, as has their spread across available habitat.

Grey seal distribution and abundance in Wales varies seasonally and between land and sea: Autumn ground counts since 1992 show highest pup production in Pembrokeshire (top map); summer aerial surveys (2023) indicate more seals haul out in north-west Wales (middle map); modelled at-sea distribution (bottom map), based on summer counts and telemetry data (2005–2019), suggests highest at-sea abundance in North Wales.

Despite grey seals facing several pressures in the region (Celtic and Irish Seas), the population appears to be thriving. Bycatch is substantial in net fisheries in the Celtic Sea, though not exceeding OSPAR population thresholds. Additional pressures include habitat displacement, disturbance and injury from noise from marine industrial and military activities and shipping, increased storm events affecting pup survival, and potential changes in prey availability from natural and anthropogenic causes. Intraspecific predation by adult males has caused pup mortality in some colonies in the UK, including in Wales.

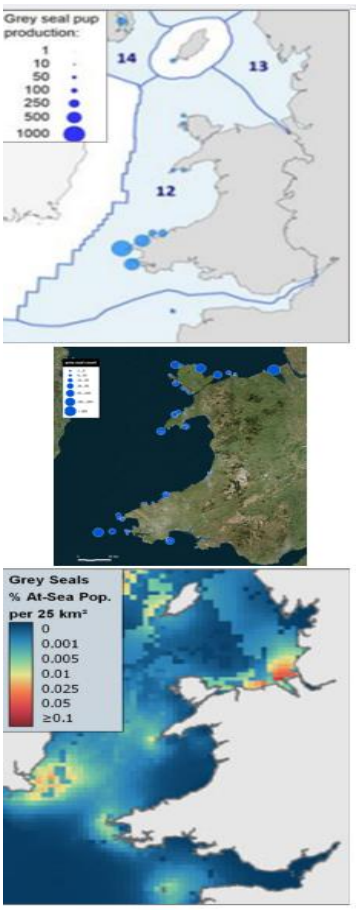
Grey seals are protected under various legal frameworks including the Conservation of Seals Act 1970, which recently prohibited the intentional or reckless killing, injuring and taking of seals. Three Special Areas of Conservation (SACs) have grey seal as a qualifying feature in Wales: Pembrokeshire Marine, Cardigan Bay and Pen Llŷn a'r Sarnau SACs. UK surveillance programs address bycatch and strandings. A national Marine Noise Registry tracks impulsive industrial noise, and mitigation guidelines are widely used to minimise harm from noise from geophysical surveys, piling, and explosives. The Welsh Government requires catch recording and vessel tracking on all fishing vessels and is developing Fisheries Management Plans that will consider interactions with grey seals.

While multiple pressures are ongoing, the grey seal population is increasing and its range is stable. Legislative changes have reduced lethal control, and future threats are not expected to worsen. The species' varied diet may provide resilience to changing prey distributions. Regional conservation, monitoring, and mitigation efforts support continued population health under current conditions.

The overall conservation status of grey seals in the UK is assessed as Favourable, which is also the case for Wales. The previous UK-wide assessment (2019) also reported the status as Favourable. The overall trend in UK and Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

ANNEX II, V

Credit: Skomer MCZ Staff



Distribution and abundance of grey seal in Wales: Pup production (top), hauled-out seals (middle), modelled at-sea distribution (bottom).

S1364 Species population and short-term trends (UK and Wales)

Population size unit: number of individuals

Population size: UK – 162,000 (Wales – 5,220)

Population size in National Site Network: UK – 67,168 (Wales – Unknown)

Range short-term trend: Stable

Population short-term trend: Increasing

Habitat short-term trend: Unknown

S1364 Favourable conservation status and trend (UK and Wales)

Range status: Favourable (FV)

Population status: Favourable (FV)

Habitat status: Unknown (XX)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

6. Habitat Reports

All distribution and range maps included in the one-page habitat summaries are based on 10km grid square records considered representative of the current reporting period. These maps were produced by JNCC using data provided by NRW. See introductory sections on Methodology and Data sources and resources for more details.

6.1 Coastal and Dune habitats

Image credit: Heather Lewis, NRW

H1210 Annual vegetation of drift lines

H1220 Perennial vegetation of stony banks

H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts (‘Vegetated sea cliffs’)

H1310 Salicornia and other annuals colonising mud and sand

H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

H1420 Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) (‘Mediterranean saltmarsh scrub’)

H2110 Embryonic shifting dunes

H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (‘White dunes’), (‘Shifting dunes with marram’)

H2130 Fixed dunes with herbaceous vegetation (‘Grey dunes’), (‘Fixed dunes’)

H2150 Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) (‘Decalcified dune heath’)

H2170 Dunes with Salix repens ssp. Argentea (*Salicion arenariae*) (‘Dunes with creeping willow’)

H2190 Humid dune slacks

H1210 Annual vegetation of drift lines

Annual vegetation of drift lines consists of ephemeral and seasonal plant communities growing on dynamic and variable substrates composed of drift material, gravel or mixed gravel and sand enriched with nitrogenous organic matter at or above the high-tide mark. The dynamic nature of the substrate means that vegetation may be present in one year but not the next. The habitat supports salt and drought tolerant species such as Sea Rocket (*Cakile maritima*), Sea Sandwort (*Honkenya peploides*), Saltwort (*Salsola kali*), and Oraches *Atriplex* spp. And correspond to National Vegetation Classification (NVC) types SD2 (*Honkenya peploides – Cakile maritima* strandline community) and SD3 (*Matricaria maritima – Galium aparine* strandline community). Similar vegetation found exclusively on sandy beaches is classified separately as Embryonic shifting dunes (H2110). For further information on Annual vegetation of drift lines, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1210/.

This habitat is currently found in 47 10km grid squares across Wales, compared to 23 grid squares in 2013. The increase is attributed to improved survey coverage rather than a genuine expansion of range. There is no evidence of actual change in the habitat's range since the last report in 2018. An overall recorded increase of 26.1 ha, equivalent to 66.4%, has been observed which is again attributed to improved survey coverage rather than a genuine expansion of area.

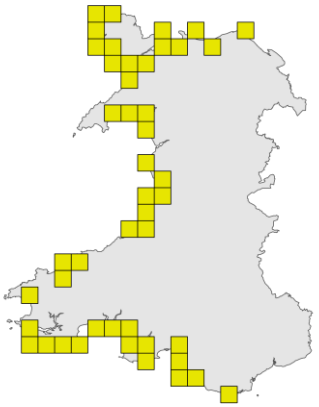
Key pressures on this habitat include tourism-related beach cleaning and trampling, shoreline modifications, and vehicle access, all contributing to habitat damage or loss. Climate change-related threats include increased wave exposure, storm surges, sea-level rise, and shifts in habitat location and quality. Temperature and precipitation changes may further alter species composition and favour invasive species. All these pressures are ongoing and expected to persist into the future.

Condition of the habitat could be improved if buffer zones are created with appropriate conservation management to allow for the dynamic movement of driftline habitats inland where there are no existing barriers. Where there are existing barriers such as sea defences, targeted realignment to enable more connectivity of driftline habitats is desirable. Efforts to reduce human disturbance, including trampling and vehicular access, are being supported through public engagement.

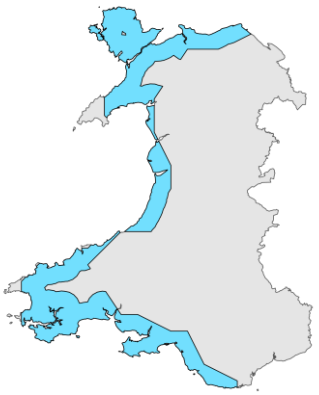
Despite legal protection at several sites, the area and structure of this habitat are likely to decline due to sediment disruption from shoreline structures and intensified storm events. Unchecked pedestrian and vehicle access, along with ongoing beach cleaning outside protected sites, are expected to further degrade habitat condition. Sea-level rise and increased storminess may result in significant vegetation loss over time, negatively affecting both extent and ecological function. Although recent surveys provide comprehensive spatial data, the future condition remains uncertain without consistent conservation intervention and monitoring.

This first Wales-level assessment of Annual vegetation of drift lines classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, consistent with the previous UK-level evaluation.

Credit: JBA Consulting under contract to NRW



Distribution map for H1210



Range map for H1210

H1210 Habitat area and short-term trends

Surface area (km^2): 0.393

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H1210 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Unfavourable-inadequate (U1)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H1220 Perennial vegetation of stony banks

Perennial vegetation of stony banks (vegetated shingle) is among the rarest coastal habitats in Wales and supports diverse vegetation types on deposited pebbles and gravel ranging in size from 2–200 mm. These include pioneer communities with species like Sea Kale (*Crambe maritima*), Sea Sandwort (*Honckenya peploides*), and Sea Beet (*Beta vulgaris* subsp. *Maritima*), and secondary pioneers such as Sea Mayweed (*Tripleurospermum maritimum*) and Curled Dock (*Rumex crispus*). Mature communities include grasslands dominated by Creeping Bent (*Agrostis stolonifera*) and Red Fescue (*Festuca rubra*), saltmarsh grasslands, heathlands, and scrub communities. The Annex I habitat type predominantly consists of perennial vegetation on upper shingle beaches, typically corresponding to the National Vegetation Classification (NVC) community SD1 (*Rumex crispus – Glaucium flavum*). For further information on vegetated shingle, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1220/.

The habitat is found in 22 10km grid squares across Wales. This differs from the 2013 report which recorded it in 14 grid squares, but the difference results from enhanced recent surveys rather than a genuine distributional change. There is no evidence of actual change in the habitat's range since the 2018 report. The habitat was reported to cover 52.96 ha between 2013 and 2018 and now reported to cover 13.61 ha (2019 – 2024) with an overall decrease of 39.35 ha reported due to the re-analysis of existing survey data in addition to more accurate data from recent surveys. Local decreases in area are due to changes in coastal morphology, vegetation succession, and management changes.

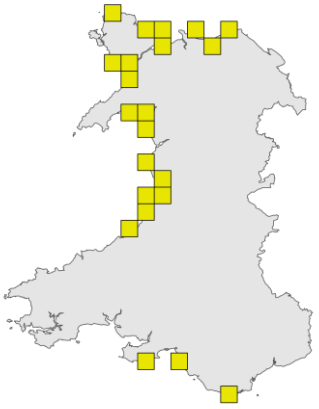
Key pressures on this habitat include beach area development and maintenance, recreational activities, and coastal modifications, all of which affect the habitat's expansion and structural integrity. Climate-driven changes such as increased wave exposure and storms further exacerbate threats. Medium-level pressures stem from roads and infrastructure disrupting geomorphological processes, modified flood regimes, and effects from temperature and precipitation shifts and sea-level rise. The pressures are persistent and expected to continue affecting both the area and quality of the habitat.

Current measures include efforts to reduce recreational and tourism pressures and manage coastal and hydrological changes to benefit habitat structure and function. Adaptation actions to climate change are being encouraged, such as creating buffer zones and promoting inland habitat movement. Additional strategies include restoring hydrologically altered habitats and managing ecological succession.

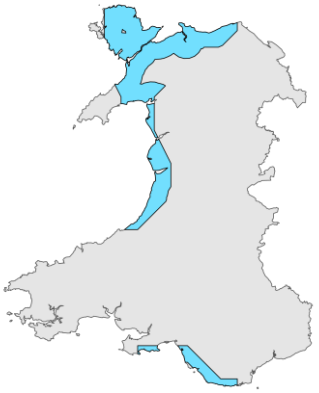
Although statutory protection at several sites may help prevent total habitat loss, the area and structure are likely to decline. Shoreline structures limiting sediment transport, recreational disturbance, and predicted sea-level rise are expected to negatively impact both the area and ecological function. Beach cleaning outside protected areas may further reduce habitat integrity. Overall, future prospects for the habitat's area and structure remain unknown, with trends considered negative due to persistent pressures unlikely to be fully mitigated by existing conservation measures.

This first Wales-level assessment of Perennial vegetation of stony banks classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: Julie Creer, CCW



Distribution map for H1220



Range map for H1220

H1220 Habitat area and short-term trends

Surface area (km^2): 0.1361

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H1220 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H1230 Vegetated sea cliffs

Vegetated sea cliffs are widespread along the Welsh coast, especially in Pembrokeshire, the Llŷn peninsula, Anglesey, south Gower peninsula, the Great Orme, Vale of Glamorgan and Ceredigion. The sea cliff vegetation is influenced by maritime conditions such as salt spray and exposure. Sea cliff vegetation colonizes ledges of the vertical to near-vertical cliff faces and the adjacent cliff tops where can be found up to 500m inland in exposed locations. For further information on Vegetated sea cliffs, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1230/.

Both hard and soft cliffs are present in Wales, although soft cliffs are much less extensive. These cliffs support various vegetation types including crevice and ledge communities, maritime grassland, maritime heathland, seabird and soft cliff vegetation. The core National Vegetation Communities which make up sea cliff habitats include Maritime Communities MC1 and MC4-12, and Heath vegetation types H7 and H8d. Soft cliff vegetation can be very mobile generating mosaics of pioneer and ruderal vegetation along with grasslands, scrub and seepages and small areas of wet land vegetation. Open habitats of soft cliffs are important for invertebrate species.

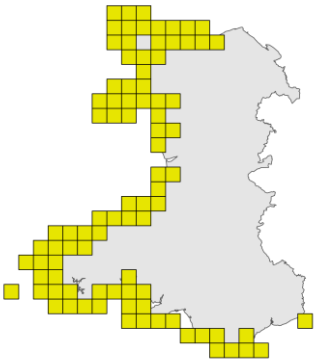
There is no evidence to indicate a genuine change in range of Vegetated sea cliffs in Wales since 2013, nor is one considered likely to have occurred. The overall extent of vegetated sea cliff habitat in Wales is considered to have declined both in the long and short term. No loss in extent was recorded from the four Special Areas of Conservation (SACs) supporting this feature monitored between 2013 and 2018; however, 27% of the total feature area lies outside protected sites, where there has been little monitoring. Crevice and ledge communities and seabird vegetation are under-recorded due to terrain and access limitations.

Vegetated sea cliffs face multiple pressures, including abandonment of cliff top grazing leading to scrub encroachment, and agricultural intensification which contributes to habitat fragmentation and degradation. Other pressures include atmospheric nitrogen deposition, invasive non-native species and climate change-induced effects such as increased erosion and sea-level rise. Erosion does occur naturally but leads to loss where habitat 'roll-back' is obstructed by intensive farmed land or development. Vegetated sea cliff habitat remains vulnerable to habitat fragmentation, poor condition, and slow decline in extent due to continued pressures

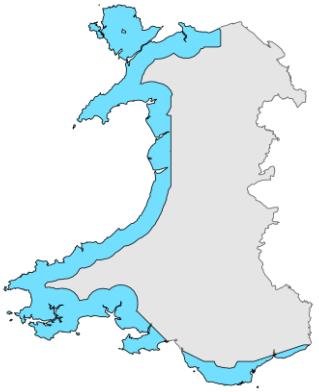
Approximately 73% of Vegetated sea cliffs lies within designated sites, offering some protection from land use change. Restoration projects have led to positive interventions such as grazing management, control of invasive species and scrub clearance. Management agreements within Sites of Special Scientific Interest and agri-environment schemes have also contributed to improving condition. Atmospheric Nitrogen deposition is likely to continue to impact habitat quality for a significant portion of the feature area for the next decade. Into the future, the impacts of climate change will become more apparent, causing other pressures to be exacerbated.

This Wales-level assessment of Vegetated sea cliffs of the Atlantic and Baltic coasts classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Heather Lewis, NRW



Distribution map for H1230



Range map for H1230

H1230 Habitat area and short-term trends

Surface area (km^2): 31.13

Area short-term trend: Decreasing

Range short-term trend: Stable

Structure and function short-term trend: Decreasing

H1230 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H1310 *Salicornia* and other annuals colonizing mud and sand

Salicornia and other annuals colonising mud and sand forms a dynamic pioneer habitat composed primarily of annual species, and it is generally sparsely vegetated. The extent and distribution of this habitat are dependent on coastal processes. The core National Vegetation Classification (NVC) communities for this habitat type include SM8 (Annual *Salicornia* spp. Salt-marsh community) and the less common SM9 (*Suaeda maritima* salt-marsh community). For further information on the *Salicornia* habitat, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1310/.

Within Wales, this habitat occurs mainly in estuaries and sheltered bays and is relatively widespread along the coast, excluding the Severn Estuary. It typically forms scattered stands along the lower edge of saltmarshes, creek sides, or within pans. There is no evidence indicating a genuine change in the 10 km square distribution or range of the habitat in Wales since 2018. The direction of change in extent is listed as unknown due to difficulties in quantifying net losses and gains of this dynamic habitat. The current extent is given as 167ha.

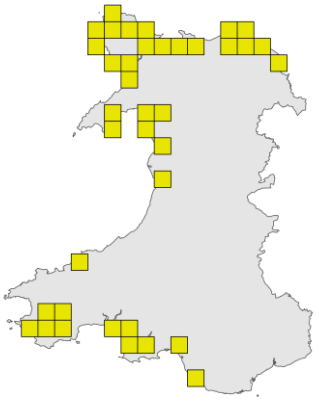
Key pressures include climate related sea level rise, changes to wave exposure and marine pollution from numerous sources. In some areas diffuse nutrient pollution is causing opportunistic macroalgae growth which can smother the pioneer communities. Modelling has forecast up to 25% loss in extent as a whole by 2025 due to coastal squeeze (where habitats are squeezed between rising sea-levels and sea defenses) if not addressed, and the habitat has been assessed as highly vulnerable to air temperature increases into the future. Additional threats include modification of the coastline for flood defences which could lead to further habitat loss through coastal squeeze, infrastructure development and illegal harvesting of *Salicornia* plants.

The National Habitat Creation Programme (NHCP) provides compensatory saltmarsh habitat for losses due to coastal squeeze associated with sea defence projects. To date, there are two sites where saltmarsh has been created by managed realignment: at Cwm Ivy on the Gower peninsula and at Morfa Friog on the Mawddach estuary. There are numerous similar projects to create saltmarsh which are being developed to provide compensation habitat. Climate change adaptation at the coast is addressed via Shoreline Management Plans. Their aim is to reduce the risks to people, the developed, historic and natural environments over the next century, identifying a sustainable approach to managing the flood and coastal erosion risks. Other conservation actions include efforts to reduce marine pollution through regulation and enforcement initiatives.

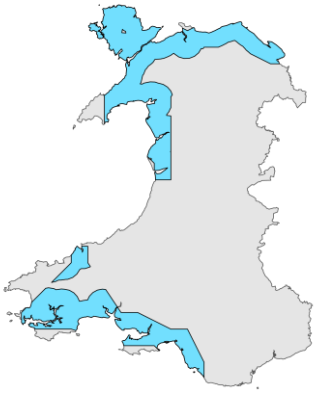
Future prospects for the *Salicornia* habitat depend on mitigating existing pressures, particularly those from climate change and sea-level rise. There is medium confidence in projections due to uncertainties around sediment supply and estuary infilling. The extensive statutory protection of the habitat (covering 97%) supports its resilience, but timely implementation of Shoreline Management Plans and habitat creation remains essential. Failure to implement these measures could lead to further habitat losses.

This first Wales-level assessment of *Salicornia* and other annuals colonising mud and sand classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, consistent with the previous UK-level evaluation.

Credit: Heather Lewis, NRW



Distribution map for H1310



Range map for H1310

H1310 Habitat area and short-term trends

Surface area (km^2): 1.67

Area short-term trend: Unknown

Range short-term trend: Unknown

Structure and function short-term trend: Uncertain

H1310 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Unknown (XX)

Structure and function status: Favourable (FV)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H1330 Atlantic salt meadows

Atlantic salt meadows includes the marsh above the pioneer zone through to the upper marshes, and is strongly influenced by coastal processes. The core National Vegetation Classification plant communities associated with this habitat type are SM10-SM20, SM22-24, SM26 (salt-marsh communities), and S21 (*Scirpus maritimus* swamp). However, the full characteristic sequence of saltmarsh zonation from pioneer plant communities to the upper marsh transitions are scarce in Wales as the presence of sea defenses often cuts off the transitional vegetation at the landward edge of the marsh from tidal inundation. For further information on Atlantic salt meadows, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1330/.

Atlantic salt meadows are widespread across Wales, predominantly within estuaries and sheltered bays. The largest areas occur in the Burry Inlet and adjacent Three Rivers complex. No recorded losses or gains in habitat have altered the range since the 1980s. The extent of the Atlantic salt meadows in Wales is currently given as 7478ha.

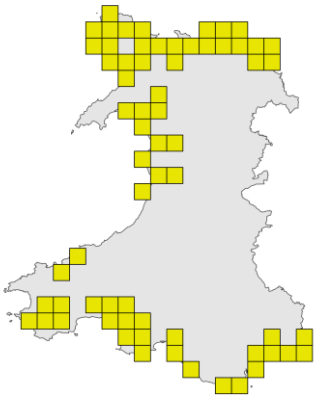
Many saltmarshes are grazed, which is generally beneficial, but marshes face pressures from both abandonment of grazing and overgrazing, causing reduced species diversity. Marine pollution from numerous sources is an ongoing concern, as is atmospheric nitrogen deposition. Sea-level rise will lead to coastal squeeze (where habitats are squeezed between rising sea-levels and sea defences), and other climate-related pressures like changes in wave energy and storm frequency pose major threats. Modelling has forecast up to 25% loss in extent as a whole by 2055 due to coastal squeeze if it is not addressed. Further physical modifications to the coast could lead to ongoing habitat loss.

Conservation measures include reinstating appropriate grazing levels, pollution reduction, and climate adaptation projects. The National Habitat Creation Programme provides compensatory saltmarsh habitat for losses due to coastal squeeze associated with sea defense projects. To date there are two sites where saltmarsh has been created by managed realignment – at Cwm Ivy on the Gower peninsular and at Morfa Friog on the Mawddach estuary – and there are numerous similar projects to create saltmarsh for compensation habitat being developed. Climate change adaptation at the coast is addressed via Shoreline Management Plans. Their aim is to reduce the risks to people, the developed, historic and natural environments over the next century, identifying a sustainable approach to managing the flood and coastal erosion risks.

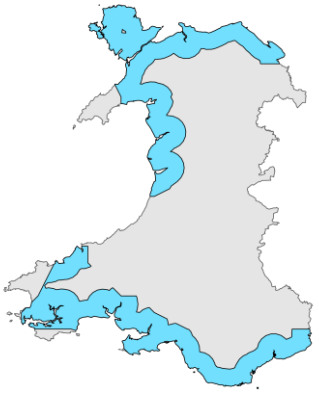
Future prospects are mixed. While the habitat benefits from statutory protection, sea-level rise remains a primary threat. Coastal squeeze could result in range and extent reductions. Habitat structure and function are improving in some areas, yet significant pressures persist. Timely implementation of shoreline management plans and establishing compensatory habitats will be essential for resilience into the future and long-term sustainability.

This first Wales-level assessment of Atlantic salt meadows classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Heather Lewis, NRW



Distribution map for H1330



Range map for H1330

H1330 Habitat area and short-term trends

Surface area (km^2): 74.82

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Decreasing

H1330 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H1420 Mediterranean saltmarsh scrub

Mediterranean saltmarsh scrub is a scarce habitat dominated by *Sarcocornia perennis*; a species which is close to its northern limit in Wales. The vast majority of the habitat feature in the UK is located on the South East coast of England; in Wales, it is only present within the Artro and Mawddach estuaries on Cardigan Bay coast. This habitat type lies within the Pen Llŷn a'r Sarnau Special Area of Conservation (SAC) and the Morfa Harlech a Morfa Dyffryn SAC, however it is not a designated feature of either of these SACs. It forms part of the saltmarsh feature of the Aber Mawddach Site of Special Scientific Interest (SSSI) and Morfa Dyffryn SSSI. For further information on Mediterranean saltmarsh scrub, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1420/.

The vegetation Is composed the SM7 *Arthrocnemum perenne* National Vegetation Community (NVC) type and covers less than 7 ha in total across the two estuaries. No other examples of SM7 have been recorded in Wales and there are no records of *Sarcocornia perennis* elsewhere in the country. This specific habitat has not been monitored since a survey in 2003 survey of Pen Llŷn a'r Sarnau SAC. Confidence in distribution and surface area is low due to lack of monitoring and the age of the survey data.

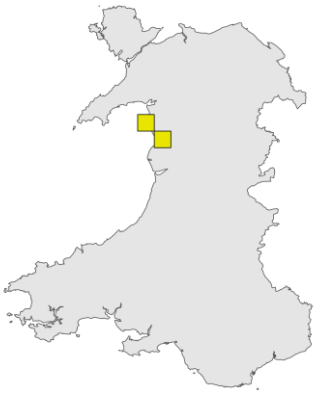
Climate-related threats include sea-level rise, wave exposure, and temperature extremes, all with varying levels of projected impact. Coastal defence structures contribute to coastal squeeze (where habitats are squeezed between rising sea-levels and sea defences), and changes in sediment transport, which may compromise the habitat's ability to adapt to sea-level rise. Ongoing and future pressures include dredging for recreational boating, and marine litter. Unregulated harvesting of *Salicornia* spp. Poses a risk to *Sarcocornia perennis* due to their co-occurrence.

Conservation actions include habitat restoration, pollution reduction and climate adaptation measures. The National Habitat Creation Programme (NHCP) creates compensatory saltmarsh habitat for habitat lost due to coastal squeeze. To date there are two sites where saltmarsh has been created by managed realignment: at Cwm Ivy on the Gower peninsular and at Morfa Friog on the Mawddach estuary. *Sarcocornia perennis* plants have become established within the Morfa Friog site where there is potential for it to spread further.

Sea-level rise and associated coastal squeeze could significantly reduce overall saltmarsh extent. Although protected, the small habitat extent across the two locations means that the Mediterranean saltmarsh scrub is particularly vulnerable. Long-term sustainability will depend on broader application of protective measures and effective follow-through on planned management strategies.

This first Wales-level assessment of Mediterranean saltmarsh scrub classifies its overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: Heather Lewis, NRW



Distribution map for H1420

Range map for H1420

H1420 Habitat area and short-term trends

Surface area (km^2): 0.07

Area short-term trend: Unknown

Range short-term trend: Unknown

Structure and function short-term trend: Uncertain

H1420 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Unknown (XX)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H2110 Embryonic shifting dunes

Embryonic shifting dunes are the first stages of dune formation. These dunes form where debris on the beach (driftwood and seaweed) trap sand above the high tide mark. The predominant plants are strandline species such as Sea Rocket (*Cakile maritima*) and the two pioneer, salt-tolerant, sand-binding grasses: Lyme grass (*Leymus arenarius*) and Sand Couch (*Elytrigia juncea*). Vegetation corresponds to National Vegetation Classification (NVC) community SD4 (*Elymus farctus* ssp. *Boreali-atlanticus* foredune community) and SD5 (*Leymus arenarius* mobile dune community). The habitat is highly dynamic and dependent on continuous physical processes at the dune / beach interface. Embryonic shifting dunes are the precursor to the main dune-building vegetation dominated by Marram grass (*Ammophila arenaria*). The habitat is ephemeral, being susceptible to extreme high tides and seasonal storms and may be better represented in some years than others. For further information on Embryonic shifting dunes, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H2110/.

Embryonic shifting dunes are found in 35 10km grid squares across Wales. This differs from the 36 grid squares recorded in 2013, though the change is due to updated surveys rather than a true shift in distribution. The habitat's range is considered stable, with no recorded losses or gains at the 10km square level. The estimated surface area was 106.2 ha between 2013 and 2018, showing a recorded reduction of 59.03 ha in 2022 compared to previous data. The reduction is likely due to the re-analysis of existing survey data in addition to more accurate data from recent surveys. Local decreases in area are due to increasing dune stabilisation and coastal processes disruption.

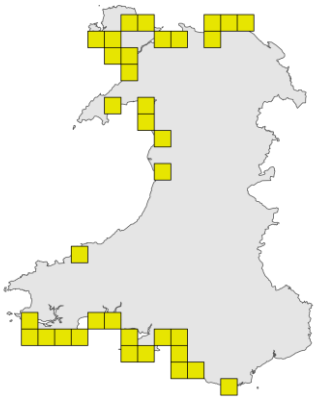
High-impact pressures include beach cleaning, which removes precursor vegetation, and recreational activities that cause trampling and damage. Shoreline structures restrict sediment transport, threatening the habitat's sustainability. Climate change-related threats include wave exposure, storms, habitat shift, and sea-level rise. Atmospheric nitrogen deposition poses a significant threat. Medium-impact pressures include air pollution, infrastructure, and military activities that disrupt habitat structure and management efforts.

Conservation is focused on habitat restoration, managing recreational pressures, and maintaining natural coastal processes. Adaptation measures to climate change include buffer zone creation and shoreline policy implementation. Air quality and sustainable agriculture policies aim to address nitrogen impacts, while specific procedures manage unexploded ordnance risks on military-used sites.

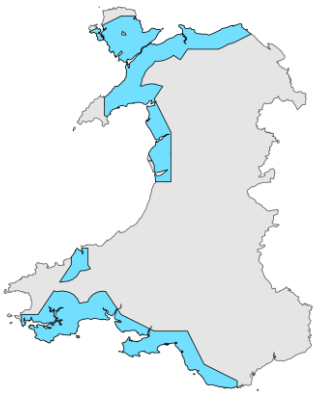
Future prospects for Embryonic shifting dunes are uncertain and likely negative if current pressures persist without mitigation. Continued coastal stabilisation, sea-level rise, and beach cleaning may reduce habitat area and integrity. Several pressures are expected to intensify with climate change, further degrading structure and function. Much of the habitat is expected to remain in unfavourable condition due to atmospheric nitrogen deposition.

This first Wales-level assessment of Embryonic shifting dunes classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Julie Creer, NRW



Distribution map for H2110



Range map for H2110

H2110 Habitat area and short-term trends

Surface area (km^2): 0.4717

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Stable

H2110 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H2120 Shifting dunes with marram

Shifting dunes with marram (*Ammophila arenaria*) are dominated by this sand-binding grass and typically occur in areas with active sand movement. This vegetation type corresponds to the National Vegetation Classification (NVC) communities SD5 (*Leymus arenarius* mobile dune community) and SD6 (*Ammophila arenaria* mobile dune community). It forms part of a dynamic transitional zone from marine to terrestrial environments and can develop on both accreting and eroding dunes, but rapidly disappears if the sand becomes stable. For further information on Shifting dunes with marram, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H2120/.

In Wales, the habitat is found in 42 10km grid squares, a change from the 41 grid squares recorded in 2013. This apparent difference is attributed to improved survey methods rather than a true change in distribution. The habitat area was recorded as 361.81 ha for 2013–2018. There has been a recorded overall increase in area of 5.96 ha (1.6%), but the trend towards dune stabilisation has likely led to localised losses.

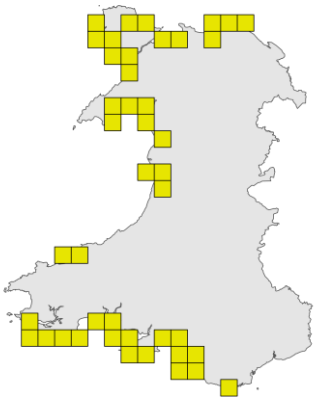
High-level pressures include tourism infrastructure and activities, shoreline modifications, and invasive species. Activities like beach cleaning and vehicle use damage dunes and hinder natural habitat development. Coastal structures restrict sediment movement, while invasive species like Sea Buckthorn (*Hippophae rhamnoides*) threaten biodiversity. Climate change pressures such as sea-level rise, storm events, and nitrogen deposition also negatively affect the habitat.

Conservation actions have been undertaken on multiple sites to maintain the open nature of this habitat, which has become stabilised and often invaded by scrub and invasive native and non-native species. Conservation measure such as frontal dune notching, re-profiling, scraping, and removal of invasive species like Sea Buckthorn have been undertaken by externally funded projects such as Sands of LIFE and Dynamic Dunescapes. The projects have also addressed safety concerns such as unexploded ordnance risk and have developed management frameworks to support continued management. New legislation such as the Environment (Air Quality and Soundscapes) (Wales) Act 2024 may further aid habitat protection.

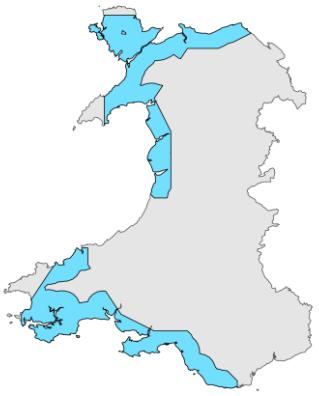
Without ongoing conservation, the habitat area is likely to decline due to stabilisation, visitor pressure, sea-level rise, and beach cleaning. Future structural and functional integrity of the habitat is also at risk if high-ranking pressures intensify. While 74% of the habitat lies within protected sites, several remain in unfavourable condition. The continuation of current conservation projects and improved management of pressures offer some potential for steadying the habitat's condition. Much of the habitat is expected to remain in unfavourable condition due to atmospheric nitrogen deposition.

This first Wales-level assessment of Shifting dunes with marram classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Deteriorating.

Credit: Peter Rhind, CCW



Distribution map for H2120



Range map for H2120

H2120 Habitat area and short-term trends

Surface area (km^2): 3.6777

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Stable

H2120 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H2130 Fixed dunes

Fixed dunes (or 'grey dunes') occur in Wales inland of the Marram grass dominated shifting dunes. These habitats develop in more stable dune areas where organic sand content has increased. The vegetation of fixed dunes is complex and corresponds to several National Vegetation Classification (NVC) communities. They are typically dominated by Red Fescue (*Festuca rubra*) and are classically rich in calcareous species, which often becomes the main vegetation type. However, depending on the community type other grasses may predominate in some locations. In Wales the Fixed dunes are calcium rich (due to high marine shell content of the sand) and support an abundant array of forbs. In certain communities, lichens are also significant components of the vegetation. Despite being generally fixed in nature, localised erosion can result in bare patches of sand or blowouts, and winds can bring an influx of fresh calcium rich sand, nourishing the vegetation. For further information on Fixed dunes see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H2130/.

In Wales, the habitat is found in 44 10km grid squares. This is a slight reduction from the 46 squares recorded in 2013, a difference attributed to improved survey accuracy rather than actual habitat loss. Recent vegetation surveys have mapped the vegetation to have an estimated area of 2,935.94 ha with an overall increase in recorded area of 284.24 ha (9.7%). The short-term range trend is considered stable, with no known complete losses or gains in grid squares during the past 12 years.

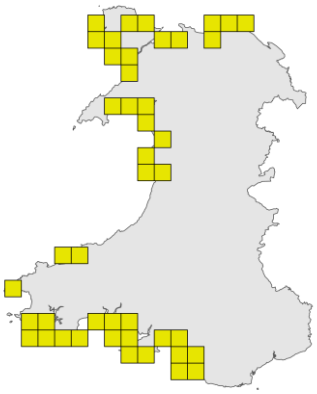
Key ongoing pressures on this habitat include undergrazing, pollution generated by livestock farming, invasive species and tourism-related activities. Scrub encroachment, exacerbated by lack of grazing, is common and invasive non-native species like Sea Buckthorn (*Hippophae rhamnoides*) are particularly problematic. Airborne nitrogen pollution is widespread, with 100% of the habitat exceeding the critical nitrogen load. Additional pressures stem from recreational infrastructure, climate change, forestry changes, and coastal modifications that hinder dune mobility.

Current conservation measures have been implemented both through statutory protections and targeted projects. About 79% of the habitat lies within protected Sites of Special Scientific Interest (SSSIs) and 68% within Special Areas of Conservation (SACs). Habitat restoration has been implemented by externally funded projects (e.g. Sands of LIFE and Dynamic Dunescapes) and conservation measures have included native scrub and Sea Buckthorn removal, mowing and restoration of grazing. The projects have also addressed safety concerns such as unexploded ordnance risk and have developed management frameworks to support continued management.

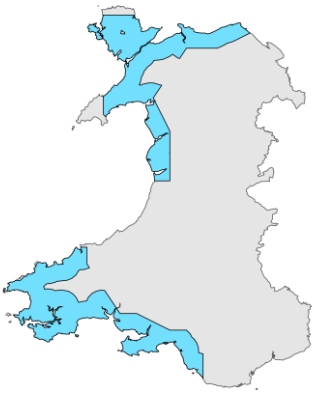
Although conservation measures have mitigated some habitat degradation, the future outlook remains mixed. Range stability is expected, but over-stabilisation, nutrient enrichment, and scrub encroachment continue to degrade structure and function. The habitat is overwhelmingly in unfavourable condition, with 71% of assessed areas classified as such. While protected sites show some management progress, the 21% of habitat outside of these areas lacks sufficient data or interventions. Without continued and expanded management, pressures are likely to persist and intensify under ongoing climate change and atmospheric pollution, limiting the potential for recovery.

This first Wales-level assessment of Fixed dunes classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Deteriorating.

Credit: Julie Creer, CCW



Distribution map for H2130



Range map for H2130

H2130 Habitat area and short-term trends

Surface area (km^2): 29.3594

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Stable

H2130 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H2150 Decalcified dune heath

The most characteristic habitat in the Atlantic decalcified fixed dunes in Wales is dune heath, in which the ericoid heathers Ling (*Calluna vulgaris*) and Bell Heather (*Erica cinerea*), are found in combination with Sand Sedge (*Carex arenaria*). Dune heath typically occurs in the older parts of dunes where calcium carbonate has been leached, creating acidic conditions suitable for heath vegetation. It is characterised by a dense bryophyte mat with species such as *Hylocomium splendens, Hypnum cupressiforme*, and *Pleurozium schreberi*, and may also be dominated by *Cladonia* lichens where nutrient levels are low and conditions are dry. The habitat corresponds to National Vegetation Classification (NVC) types H11a and H11c, though other non-classified heaths on sand may also fall within the habitat. For further information on Decalcified dune heath see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H2150/.

In Wales the habitat is currently found in 14 10km grid squares. Recent vegetation surveys have mapped the vegetation to have an estimated area of 20.11 ha. The total recorded surface area during 2013–2018 was 33.64 ha, reflecting a 40% decline or loss of 13.53 ha compared to previous assessments. There is no evidence of a complete loss or creation of this habitat within any 10km grid square since the last reporting period. The recorded decrease in habitat area is attributed to vegetation succession and management changes at specific sites.

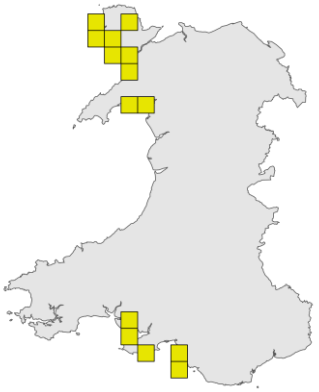
Major ongoing pressures include under-grazing, scrub encroachment, and atmospheric nitrogen deposition are all considered to have a high impact. Other pressures include recreational activities, invasive species such as Sea Buckthorn (*Hippophae rhamnoides*), and agricultural pollution.

Restoration efforts under projects like Sands of LIFE and Dynamic Dunescapes have included mowing, removal of invasive species, and removal of scrub and non-native conifer species. Despite being found on several Special Areas of Conservation (SACs) and Special Sites of Scientific Interest (SSSIs), Decalcified dune heath is not a notified SAC feature in Wales and not routinely monitored using standard methods.

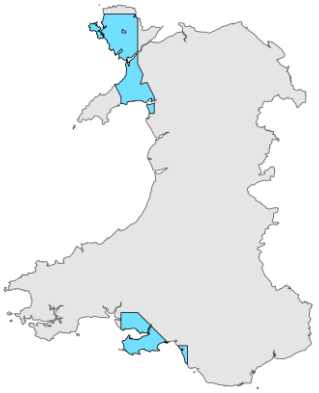
Despite current protection of some of the range, the habitat faces significant pressures that are expected to intensify due to climate change, affecting structure and function. Condition assessments show that all sites evaluated under the Dynamic Dunescapes project are in unfavourable condition. The trend in habitat area is considered unknown due to lack of data from several dune systems and limitations of existing surveys. Much of the habitat is expected to remain in unfavourable condition due to atmospheric nitrogen deposition.

This first Wales-level assessment of Decalcified dune heath classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Deteriorating.

Credit: Julie Creer, NRW



Distribution map for H2150



Range map for H2150

H2150 Habitat area and short-term trends

Surface area (km^2): 0.2011

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H2150 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H2170 Dunes with creeping willow

This habitat type comprises dunes or parts of dunes where creeping willow (*Salix repens* ssp. *Argentea*) dominates, forming prominent, low scrubby growth. Creeping willow typically occurs in and around dune slacks, although it may spread into drier zones on some sites. The vegetation corresponds to two drier sub-communities of National Vegetation Classification (NVC) community SD16 *Salix repens – Holcus lanatus* dune slack community; SD16a *Ononis repens* sub-community and SD16b *Rubus caesius* sub-community. Creeping willow is often found in Humid dune slack vegetation (H2190) and the boundaries between Dunes with creeping willow and Humid dune slacks are often diffuse and difficult to define on the ground. The examples chosen to represent Dunes with creeping willow in Wales are vegetation stands where creeping willow is dominant, forming prominent, low, scrubby growth. This type of vegetation tends to occur in drier situations in and around mature dune slacks where there has been very little or no sand movement and where grazing is light. For further information on Dunes with Creeping Willow, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H2170/.

The habitat is found in 18 10km grid squares in Wales, compared to 19 reported in 2013. This difference is attributed to updated survey data rather than an actual change in distribution. Recent vegetation surveys have mapped the vegetation to have an estimated area of 166.27 ha. Since 2001, there have been no cases of complete loss or new creation of this habitat within a 10km square. Overall, the range has remained stable since the early 1990s.

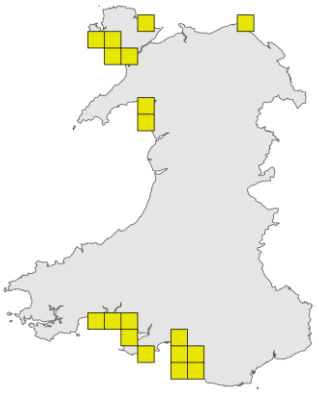
The habitat faces high pressures from under-grazing, invasive alien species like Sea Buckthorn (*Hippophae rhamnoides*), and problematic native scrub encroachment. Recreational activities, agricultural pollution and atmospheric nitrogen deposition also pose significant threats. Changes in climate (temperature and precipitation regimes) pose a significant threat to hydrological regimes potentially altering dune slack vegetation composition. Additional medium-ranked threats include abandonment of traditional management, forestry conversion, military activities, and infrastructure developments.

Externally funded projects (Sands of LIFE and Dynamic Dunescapes) have undertaken conservation actions to enhance grazing management, remove invasive species, and turf strip dune slacks to restore hydrology and vegetation structure. The projects have also addressed safety concerns such as unexploded ordnance risk and have developed management frameworks to support continued management

The habitat's range is expected to remain stable in the short to medium term. The area may remain stable or increase due to maturing slacks offsetting losses from conservation activities. Despite protective measures, all 14 assessed sites were concluded to be in unfavourable condition. If key pressures such as nitrogen pollution and climate change persist, structural degradation is likely to continue.

This first Wales-level assessment of Dunes with creeping willow classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Deteriorating.

Credit: Julie Creer, CCW



Distribution map for H2170

Range map for H2170

H2170 Habitat area and short-term trends

Surface area (km^2): 1.6627

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H2170 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H2190 Humid dune slacks

Humid dune slacks are low-lying wet depressions typically occurring between dune ridges and are a common feature of the larger hindshore and spit dune systems. Dune slacks are formed when windy conditions facilitate the scouring of sand, often behind advancing dune ridges or in blow-outs, down to the water table. When the water-table is reached the sand is saturated and immobile resulting in a flat bottomed slack. Dune slacks generally experience flooding in winter and damp conditions in summer supporting biodiverse wetland habitats. The wetness of the habitat determines the vegetation community which can range from early and young pioneer vegetation through to mature established slack vegetation. Resultantly, the vegetation of Humid dune slacks is complex and covers several National Vegetation Classification (NVC) communities. Humid dune slacks are extremely species rich and specialised habitats and often include Creeping Willow (*Salix repens*), but this habitat type excludes vegetation where Creeping Willow is dominant (SD16 sub-communities a and b) these drier sub-communities fall into the habitat Dunes with creeping willow (H2170). However, the boundary between H2170 and H2190 is somewhat diffuse. For further information on Humid dune slacks, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H2190/.

In Wales pioneer and early successional stages of dune slacks are important for the long-term maintenance of populations of the Annex II species S1395 Petalwort (*Petalophyllum ralfsii*) and S1903 Fen Orchid (*Liparis loeselii*).

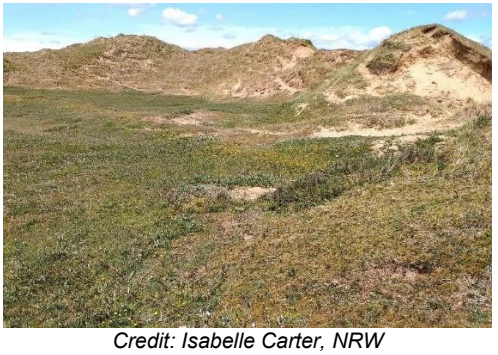
The habitat is currently found in 27 10km grid squares across Wales. This distribution increase from 25 to 27 grid squares is due to improved survey data rather than a real change in range. Recent vegetation surveys have mapped the vegetation to have an estimated area of 374.83 ha. There has been an overall area increase of 51.88 ha (13.8%) since the last assessment.

Key ongoing high-impact pressures include under-grazing, surface water pollution, invasive alien species, problematic native species, and atmospheric nitrogen deposition. Leisure activities such as off-path access, camping, and fire-making contribute significantly to habitat degradation. Climate change-driven shifts in temperature and rainfall altering hydrological regimes are expected to change species composition and habitat structure.

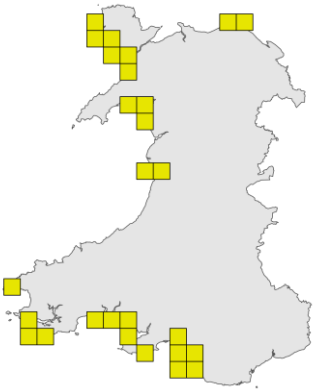
Externally funded projects (Sands of LIFE and Dynamic Dunescapes) have undertaken conservation actions to enhance grazing management, remove invasive species, and turf strip dune slacks to restore hydrology and vegetation structure. The projects have also addressed safety concerns such as unexploded ordnance risk and have developed management frameworks to support continued management.

Although distribution is unlikely to shift significantly, the habitat area is expected to decline due to stabilisation and hydrological changes. All assessed sites are currently in unfavourable condition, and pressures such as nitrogen deposition and climate change are projected to intensify. Future recovery depends on effective management to maintain dynamic geomorphological processes and early successional habitats.

This first Wales-level assessment of Humid dune slacks classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Deteriorating.



Credit: Isabelle Carter, NRW



Distribution map for H2190

Range map for H2190

H2190 Habitat area and short-term trends

Surface area (km^2): 3.7483

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H2190 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

6.2 Freshwater habitats

Image credit: Tristan Hatton-Ellis, NRW

H3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (‘Clear water, low nutrient lakes and ponds with dwarf alpine vegetation’)

H3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. (‘Clear, lime-rich lakes and ponds with stoneworts’)

H3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation (‘Naturally nutrient-rich lakes and ponds with large-leaved pondweeds’)

H3160 Natural dystrophic lakes and ponds (‘Acid peat-stained lakes and ponds’)

H3180 Turloughs

H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (‘Rivers with water-crowfoots and water-starworts’)

H3130 Clear-water, low nutrient lakes with dwarf alpine vegetation

This habitat comprises a wide range of lake and pond types with low to moderate alkalinity and when in good condition, correspondingly low nutrient levels. This includes mountain lakes, deep glacial trench lakes, and shallow lakes in upland margins. The habitat supports wave-resistant rosette plants such as quillwort (*Isoetes lacustris*), shoreweed (*Littorella uniflora*), and water lobelia (*Lobelia dortmanna*), with other species like alternate water-milfoil (*Myriophyllum alterniflorum*) and lesser bladderwort (*Utricularia minor*) in slightly more sheltered locations. Salmonids dominate the fish community, occasionally including Arctic charr (*Salvelinus alpinus*) or gwyniad (*Coregonus lavaretus*), and the habitat is critical for floating water-plantain (*Luronium natans*).

For further information on this habitat, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H3130/.

The habitat is widespread in and around the uplands of north and mid Wales and more local elsewhere. There are two subtypes: a more species-poor low alkalinity subtype, and a more diverse but rarer moderate alkalinity subtype. The total surface area is approximately 19.83 km², with 14.47 km² from low alkalinity lakes and 5.36 km² from moderate alkalinity ones. There has been no significant recent or long-term change in range or area within Wales. However, only 16.9% of the habitat was in good condition, a reduction since the previous assessment. This has been driven by spread of invasive species.

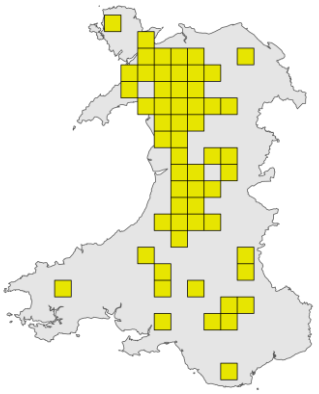
Key pressures include nutrient enrichment from agriculture and sewage, invasive plant species such as *Elodea* spp. And *Crassula helmsii*, and past acidification from air pollution. Historic and ongoing alterations such as damming, water abstraction, and reservoir use have physically modified many lakes. Climate change is expected to amplify existing pressures and drive ecosystem-level changes.

Air pollution controls and industrial decline have reduced air pollution, resulting in water quality improvements in low alkalinity lakes. Forestry and agricultural management practices are also helping to reduce acidification and nutrient pollution. Efforts to manage invasive species are ongoing, but control has so far been limited in effectiveness. Designation of new protected areas and site-specific climate adaptation are also being implemented.

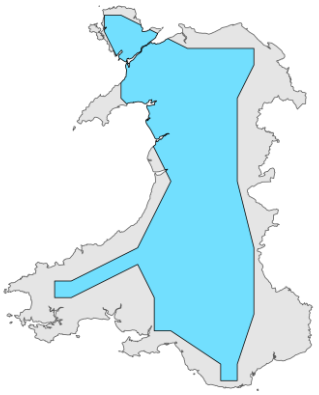
The habitat is expected to remain widespread in Wales, with no projected decline in range or area. However, future prospects for structure and function are poor due to invasive species and agricultural pressures, particularly affecting the moderate alkalinity subtype.

This first Wales-level assessment of Clear-water, low nutrient lakes with dwarf alpine vegetation classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Lin Baldock, NRW



Distribution map for H3130



Range map for H3130

H3130 Habitat area and short-term trends

Surface area (km²): 19.83

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Decreasing

H3130 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H3140 Clear, lime-rich lakes and ponds with stoneworts

This habitat consists of lime-rich lakes and ponds with low to moderate nutrient levels and very clear water. They are often groundwater-fed. Underwater vegetation consists predominantly of dense meadows of stoneworts (*Chara*), a type of complex alga that provides habitat for juvenile fish and invertebrates and limits nutrient release from sediments. Vegetation is frequently coated with limy marl precipitated during photosynthesis in these alkaline waters.

For further information on clear, lime-rich lakes and ponds with stoneworts, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H3140/.

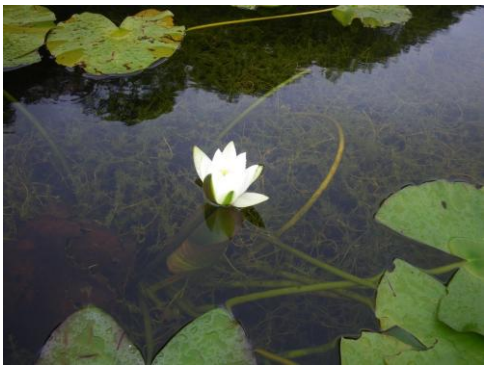
This habitat has a scattered distribution in Wales, linked to limestone geology. Only seventeen 10km squares have records of the habitat, with most covering areas of 1ha or less. There has been no known change in range or area during the current period. However, there are serious problems with the structure and function of the habitat, reflecting nutrient and invasive species pressures. Only 4% of the habitat in Wales is considered to be in favourable condition at present. Monitoring covers over 90% of the favourable reference area, focusing on species composition and water quality.

Main pressures include nutrient pollution, invasive species, and fishery management. Pollution is both current and historic, with one large site affected by legacy phosphorus in sediments. Invasive aquatic plants and introduced animals such as common carp (*Cyprinus carpio*) and Canada geese (*Branta canadensis*) also contribute to ecological stress. Future threats include climate-driven changes such as sea level rise and spread of invasive species.

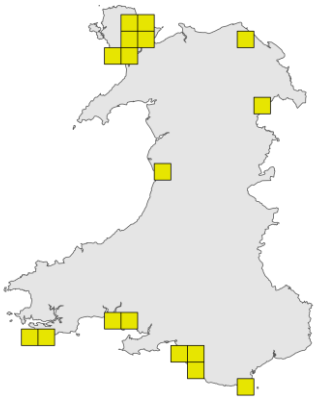
Effective conservation measures are limited. Existing measures include nutrient control through agricultural regulations, invasive species removal, and hydrological restoration.

The habitat's future is precarious due to its limited distribution and exposure to multiple pressures. Many sites face functional degradation rather than total loss, shifting towards other lake types. Despite some improved catchment and fishery management, key pressures remain and overall prospects are poor.

This first Wales-level assessment of Clear, lime-rich lakes and ponds with stoneworts classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.



Credit: Ben Goldsmith, NRW



Distribution map for H3140

Range map for H3140

H3140 Habitat area and short-term trends

Surface area (km^2): 0.855

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Decreasing

H3140 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H3150 Naturally nutrient-rich lakes and ponds with large-leaved pondweeds

This habitat consists of nutrient-rich lakes and ponds, resulting in high productivity and biodiversity. They occur mainly in lowland Wales, on soft, neutral to alkaline geology, and often support diverse species with other sub habitats such as water lily beds and fringing reedswamp. Pondweeds with large translucent underwater leaves such as shining pondweed (*Potamogeton lucens*) and perfoliate pondweed (*P. perfoliatus*) are characteristic of the habitat.

For further information on Naturally nutrient-rich lakes dominated by large-leaved pondweeds, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H3150/

This habitat is widely scattered across lowland Wales, especially on Anglesey. Many squares contain only isolated, often degraded, lakes or ponds. There is no evidence of a decline in range or area, and no substantial eutrophic lakes have been lost. However, none of the habitat surveyed is in good condition, and monitoring shows widespread degradation due to nutrient enrichment (eutrophication), low cover of typical species and impacts of invasive species.

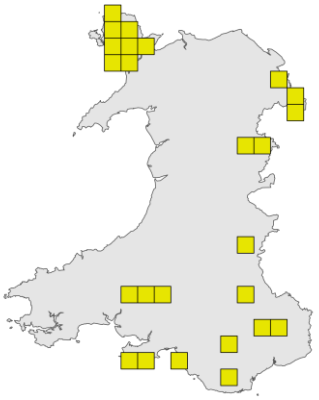
Primary pressures include agricultural and mixed-source nutrient pollution, climate change, and invasive species. Agricultural runoff and water abstraction contribute significantly to water quality degradation. Climate change exacerbates nutrient impacts through extreme weather and longer growing seasons. Invasive aquatic plants further degrade habitat quality.

Key measures target nutrient reduction from agriculture and mixed sources, and control of invasive species. The Sustainable Farming Scheme will help to reduce agricultural nutrient pressures. Restoration techniques, including dredging or even chemical treatment may be required where nutrient legacy is severe. Catchment-scale approaches and collaborative landowner projects are encouraged. Adaptation strategies include restoring river and lake catchments to reduce nutrient delivery and improve resilience to climate effects. Research is urgently needed to improve invasive species control.

Future range and area are expected to remain stable. However, structure and function are likely to deteriorate without significant intervention. Climate change will interact with high nutrient levels, potentially worsening ecological conditions. Anglesey, the habitat's core area, is particularly at risk from agricultural intensification. While current ecological status is better than nutrient levels suggest, recovery is only feasible through reduced nutrient input and enhanced management of invasives. A strategic lake restoration programme is required to improve habitat condition and resilience.

This first Wales-level assessment of Naturally nutrient-rich lakes and ponds with large-leaved pondweeds classified their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Tristan Hatton-Ellis, NRW



Distribution map for H3150

Range map for H3150

H3150 Habitat area and short-term trends

Surface area (km^2): 8.64

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

H3150 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H3160 Acid peat-stained lakes and ponds

This habitat type consists of water bodies characterised by brownish-tinted, acidic but buffered water caused by humic acids from surrounding peat. They occur in peatland-dominated catchments and are often associated with blanket bog, with many sites being remote. Due to poor water clarity and unstable substrates, these lakes typically support low plant biodiversity, though species such as *Sphagnum*, water-lilies (*Nymphaea alba* and *Nuphar* spp.), bulbous rush (*Juncus bulbosus*), and bladderworts (*Utricularia*) may be present. Some lakes are fishless, while others support trout and/or eel, and fishless systems may host unique planktonic and invertebrate communities.

For further information on Acid peat-stained lakes and ponds, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H3160/.

Dystrophic lakes are scarce in Wales and have a scattered distribution reflecting that of peatlands. They are mainly found in upland areas such as Migneint and Elenydd, with isolated examples like Llyn Llech Owain in Carmarthenshire. Seventeen known examples exist, and the largest is Llyn Fyrddon Fawr at 12ha. There has been no known change in the area or distribution of this habitat since 2019. Data on structure and function are poor, but suggest that about half of the habitat area is in good condition.

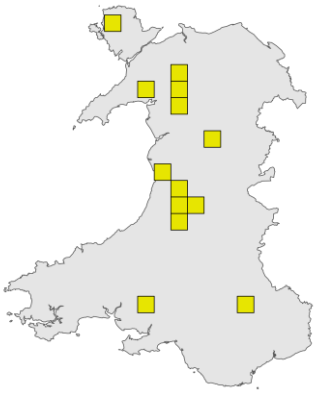
Primary pressures include drainage of surrounding peatlands for agriculture and forestry, and acidification caused by air pollution. Forestry drainage also increases sediment and pollutant transport, while nitrogen deposition may pose additional eutrophication risks. Legacy impacts from acid deposition remain, though recovery has begun due to emission reductions. Future threats are expected to mirror current pressures, with limited resources and administrative risks affecting enforcement.

Some small-scale actions have been implemented, but comprehensive programmes involving ditch blocking and forest redesign are required. Actions to control acidification, in place for about two decades, have contributed to gradual habitat recovery. Key measures include restoring blanket bogs in lake catchments to stabilise water levels and reduce peat erosion. Conservation efforts under long-range air pollution agreements and industrial decline have also improved water quality.

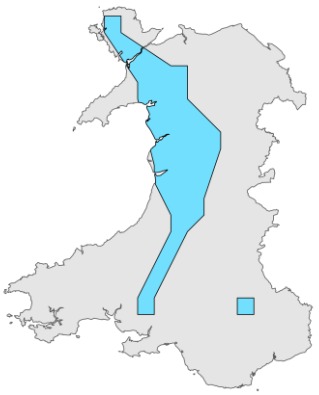
The future range and area of dystrophic lakes are considered stable, though lowland examples may be at risk from succession, drainage, or eutrophication. Technical and operational challenges continue to affect restoration of structure and function, and climate change poses an additional threat. Nonetheless, most sites are in reasonable condition, and recovery is realistic with habitat measures focused on catchment restoration. Improved conservation status could be achieved at key sites through targeted peatland restoration projects.

This first Wales-level assessment of Acid peat-stained lakes and ponds classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Improving, compared to the previous UK-level evaluation which was Stable.

Credit: Ben Goldsmith for NRW



Distribution map for H3160



Range map for H3160

H3160 Habitat area and short-term trends

Surface area (km^2): 0.65

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Increasing

H3160 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Improving

For full supporting evidence, see the searchable table of detailed reports.

H3180 Turloughs

Turloughs are temporary water bodies that form in karstic limestone landscapes due to groundwater inflow through features such as sinkholes. When groundwater levels are high, the depression floods, creating a pond or small lake, which gradually dries during dry periods. Recharge times vary widely depending on the size of the turlough and characteristics of the underlying aquifer. These habitats support a diverse range of invertebrates, amphibians and wetland plants, but do not support fish populations.

For further information on Turloughs, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H3180/.

Wales has a single turlough, Pant-y-Llyn in Carmarthenshire, which is also the only known example in Britain. There has been no change in the range or area of the habitat over both short and long-term periods. The current area is equal to the Favourable Reference Area, and no changes in the distribution pattern have occurred since the previous reporting round. Structure and function are thought to be favourable but there are no recent monitoring data.

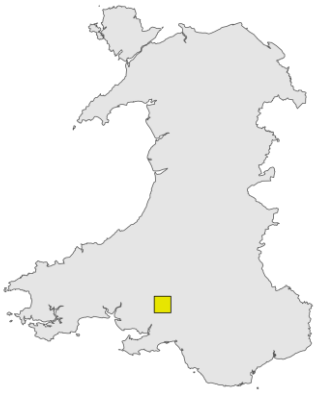
All identified pressures and threats are considered of high importance due to the habitat's extreme rarity. Current pressures include scrub invasion, which is managed through periodic clearance, and occasional nutrient spikes likely related to low water levels. Potential future threats include the re-opening or intensification of adjacent limestone quarrying and pollution events such as oil or slurry spills from the bordering road. Invasive species, including the high-risk *Crassula helmsii*, are also a threat.

Conservation actions target scrub control, risk prevention, and biosecurity. Scrub encroachment is actively managed, while measures are in place to prevent pollution from road runoff and to mitigate the risk of invasive species introductions. The habitat benefits from strong legal protection, being designated as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), and National Nature Reserve (NNR).

The future status of the turlough at pant-y-Llyn depends entirely on continued effective site management. While the habitat is legally protected, updated monitoring is needed to better assess condition and risks. Potential improvements through the Sustainable Management of Natural Resources framework include contingency planning, road drainage modifications, and biosecurity enhancements. Despite the lack of specific threats to its range or area, the habitat remains vulnerable due to its sole occurrence.

This first Wales-level assessment of Turloughs classifies their overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: Gareth Farr



Distribution map for H3180

Range map for H3180

H3180 Habitat area and short-term trends

Surface area (km^2): 0.0066

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

H3180 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H3260 Rivers with water-crowfoots and water-starworts

This habitat consists of moderate-gradient rivers and larger streams with clear water and a riffle-pool sequence over stable sand, gravel, and cobble supporting a diverse plant community. These rivers include extensive submerged aquatic plant beds, especially water-crowfoots (*Ranunculus* subgenus *Batrachium*) and water-starworts (*Callitriche* spp.). The habitat supports various species including trout, salmon, lampreys, shad, otter (*Lutra lutra*), white-clawed crayfish (*Austropotamobius pallipes*), freshwater pearl mussel (*Margaritifera margaritifera*), and the rare stonefly *Isogenus nubecula*.

For further information on Rivers with water-crowfoots and water-starworts, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H3260/.

This river type is widespread in Wales. There have been no significant changes in either distribution or range over the last decade. Recent modelling estimates 14.9 km² of this habitat in Wales, though further quality checks are needed. Recent assessments are lacking, but none of the habitat is considered to be in Good Condition. There have been multiple reports of reduction in *Ranunculus* cover in the Wye and Usk, but there is a lack of comparative data to assess this.

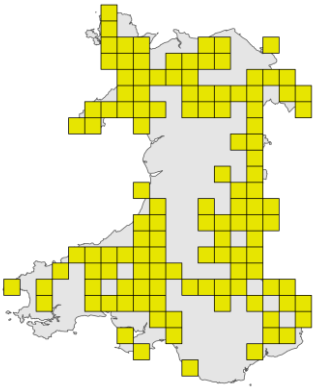
Rivers with water-crowfoots and water-starworts are subject to multiple pressures including physical alteration of water bodies, water abstraction, and flow modification. Pollution from agriculture, forestry, and urban sources contributes to eutrophication and sedimentation, degrading plant communities. Invasive species such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*), signal crayfish (*Pacifastacus leniusculus*), and Chinese mitten crab (*Eriocheir sinensis*) are increasingly problematic. Climate change leads to altered flow regimes, temperature extremes, and flooding, all of which negatively affect habitat structure and biota.

Conservation measures include river restoration, addressing barriers to fish migration, invasive species control and pollution reduction projects led by NRW and partner organisations. These initiatives have improved or restored 854 km of river environment between 2020-2024, including enhancing tree cover for thermal regulation, livestock exclusion to reduce siltation and morphological restoration to increase resilience.

The range and area of this habitat is expected to remain stable, but habitat quality is under threat. Pressures including pollution, habitat degradation, invasive species, and climate change continue to outpace restoration measures. Although prospects for restoration exist, current actions are slow to yield benefits. Without improved management, the decline in quality and loss of characteristic species are likely, putting the long-term condition of the habitat at risk.

This first Wales-level assessment of Rivers with water-crowfoots and water-starworts classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

Credit: Jon Turner, NRW



Distribution map for H3260

Range map for H3260

H3260 Habitat area and short-term trends

Surface area (km²): 20

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

H3260 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

6.3 Grassland habitats

Image credit: Stuart Smith, NRW

H6130 Calaminarian grasslands of the *Violetalia calaminariae* (‘Calaminarian grasslands’)

H6150 Siliceous alpine and boreal grasslands (‘Montane acid grasslands’)

H6170 Alpine and subalpine calcareous grasslands

H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (‘Semi-natural dry grasslands and scrublands on chalk or limestone’)

H6230 Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe) (‘Species-rich *Nardus* grassland’)

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

H6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (‘Tall herb communities’)

H6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (‘Lowland hay meadows’)

H6130 Calaminarian grasslands

Calaminarian grasslands are an extremely rare habitat in Wales, restricted to heavy metal-enriched soils and rocks. The habitat is short, open, and often sparsely vegetated, typically supporting vascular plants, bryophytes, and lichens that can tolerate high levels of heavy metals (metallophytes). In Wales, it is associated with historical heavy metal mining, including for lead, zinc, and copper, and is now mostly found on spoil heaps and tailings. The habitat can also occur very locally on river shingle influenced by metal-rich water. It is highly geographically restricted, generally lowland but with some local upland occurrences, and may be grazed or ungrazed. For further information on Calaminarian grasslands, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6130/.

The habitat has been Identified in various locations across Wales using data from 17 sources, including targeted surveys and incidental records. It includes the National Vegetation Classification (NVC) community OV37, as well as vegetation not referable to formalised vegetation types. A GIS inventory produced from these data has not been updated post-2018, although the range was amended to include one new 10km square record. The total area of 74.53 hectares is considered an underestimate due to limitations such as point-based records and unmapped small mine sites. Monitoring data indicate small-scale decreases in extent at both Special Area of Conservation (SAC) and non-statutory sites, but overall changes are difficult to quantify.

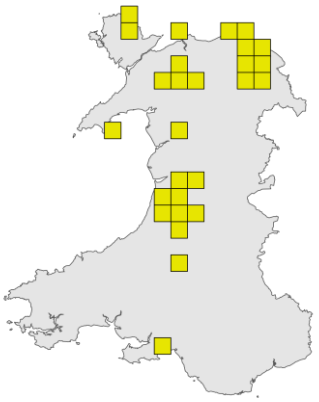
High-ranking pressures include undergrazing, invasive alien species (notably conifers), problematic native species such as gorse (*Ulex* sp.), air pollution from nitrogen deposition, and natural succession to more closed vegetation. Medium-level pressures involve abandonment of traditional land management, overgrazing, mining and extraction activities, and recreational use.

A majority of the habitat area (73%) is within Sites of Special Scientific Interest (SSSIs), with 29% also designated as a Special Area of Conservation (SAC). However, only 49% of SSSI units have active or completed management actions. Past Glastir agri-environment scheme coverage was limited to 9% of the habitat area. Key measures in place include control of invasive and problematic native species, prevention of habitat conversion, and reduction of fertiliser use, all rated highly. Other medium-ranked measures include grazing adaptation, pollution mitigation, and prevention of afforestation. Air quality measures exist but have not halted rising ammonia levels locally.

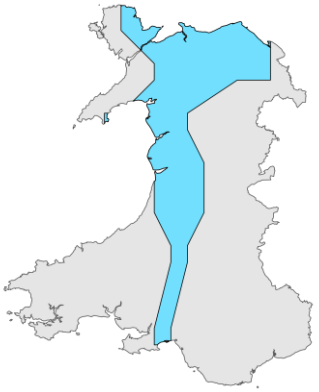
No expansion of the habitat range is expected due to environmental constraints, and small existing sites remain vulnerable. Area is likely to continue declining due to pressures like succession and inadequate conservation. Habitat condition is poor on assessed statutory sites, and very limited data exist for non-statutory sites. High nitrogen pollution affects the entire habitat area, and while some conservation actions are in place, overall prospects for structure and function remain negative.

This first Wales-level assessment of Calaminarian grasslands classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, consistent with the previous UK-level evaluation.

Credit: Stuart Smith, NRW



Distribution map for H6130



Range map for H6130

H6130 Habitat area and short-term trends

Surface area (km^2): 0.7453

Area short-term trend: Decreasing

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H6130 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H6150 Montane acid grasslands

In the UK, Montane acid grasslands are the most extensive vegetation type in the high mountain zone, forming large continuous tracts on summit plateaux and higher ridges. In Wales, the best-developed and largest areas occur in Eryri Special Area of Conservation/Site of Special Scientific Interest (SAC/SSSI), particularly on the Carneddau and Glyderau mountains. The habitat in Eryri is subject to heavy grazing, and is species-poor and degraded compared to similar vegetation types elsewhere in the British Isles. It includes National Vegetation Classification (NVC) communities U10, U7 and U8, and the Phase 1 Birks and Ratcliffe community E1. For further information on Montane acid grasslands, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6150/.

The habitat was mapped using upland NVC survey data collected before 2007, and its continued presence was confirmed by SAC monitoring in 2010, 2017, and 2021. Its largest extent is in the Carneddau, with additional occurrences in the Glyderau and Pumlumon. The total estimated area is 83.64 hectares. Monitoring indicates the extent has remained stable since the 1950s, with recent assessments suggesting no change in extent up to 2021.

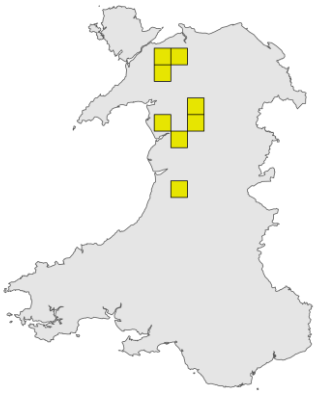
The main pressures on the habitat are intensive livestock grazing and recreational activities, particularly off-roading. Grazing is considered to have a high impact and affects 71% of SSSI units with this habitat. Recreational pressures are moderate, occurring on 8% of units. Air pollution from nitrogen deposition affects the entire habitat area, exceeding the critical load across 100% of mapped habitat polygons.

Only 26% of actions for the habitat are completed or underway, and most of the habitat (99.5%) lies within statutory sites. Conservation actions focus on adapting grazing practices, with 17 management units aiming to reduce grazing. Measures to address recreational damage and burning are present but limited in scope. About 30% of the area was covered by relevant Glastir options in 2018, though no coverage was recorded between 2020 and 2023. Policies on air pollution are in place, although not specific to the habitat.

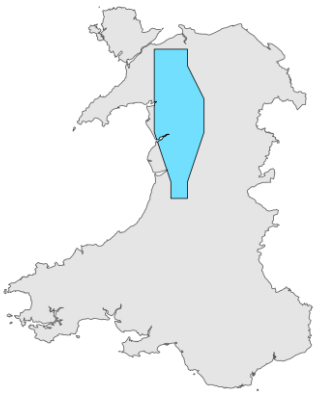
The habitat's range and area are expected to remain stable in the short term, mainly due to its location within statutory protected sites (SSSIs/SACs). However, its condition is projected to remain poor, largely due to continued over-grazing and elevated atmospheric nitrogen levels. Although signs of recovery have been observed, grazing levels are still generally too high, and 100% of the area exceeds nitrogen critical load thresholds. Without further measures to reduce nitrogen deposition, much of the habitat is expected to remain in unfavourable condition.

This first Wales-level assessment of Montane acid grasslands classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

Credit: Barbara Jones



Distribution map for H6150



Range map for H6150

H6150 Habitat area and short-term trends

Surface area (km^2): 0.84

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

H6150 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H6170 Alpine and subalpine calcareous grasslands

Alpine and subalpine calcareous grasslands are extremely rare in Wales, confined to montane ledges and rock faces within the Eryri Special Area of Conservation (SAC). It is a species-rich grassland characterised by calcicolous (lime-dwelling) species and includes various arctic-alpine plants, some of which have very restricted distributions within Wales and/or Britain. The habitat includes National Vegetation Classification (NVC) types CG12 and CG14. For further information, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6170/.

The habitat occurs only in northern Eryri and is confined to six small localities within the Eryri SAC, forming a recorded area of just 1.7 hectares. All known habitat patches were included in three main surveys, and the overall distribution is likely still accurate based on 2011 and 2016 SAC monitoring. No changes in range or extent were detected in recent monitoring rounds, although no new monitoring has been done during the current cycle. Monitoring has included principal stands but not all habitat due to its fragmentary nature.

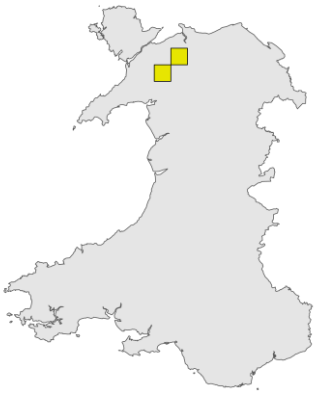
Key pressures on Alpine and subalpine calcareous grasslands include overgrazing, particularly by feral goats, which affect three of six habitat units. Airborne nitrogen pollution is a high-level threat, with all habitat areas exceeding critical nitrogen load limits. Climate change presents medium-level pressures through temperature shifts, precipitation changes, and potential habitat degradation. Minor pressures include human trampling and the presence of the non-native New Zealand willowherb *Epilobium brunnescens*, although these are considered to have low impact currently.

All known conservation actions for the habitat are identified, underway, or completed, as 100% of the habitat lies within statutory protected areas. Two primary action types, aimed at reducing grazing and recreational damage, are active on most management units. Although the habitat was previously included in the Glastir Advanced scheme for improved grazing management, coverage lapsed between 2020 and 2023. Air pollution measures are supported by national strategies and legislation, but nitrogen deposition remains a persistent issue.

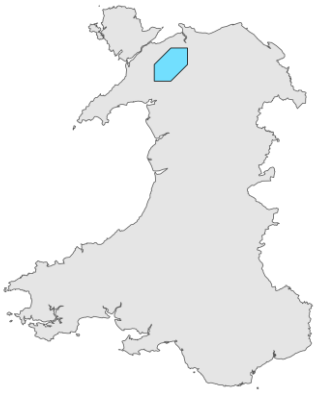
The habitat is expected to remain stable in range and area over the short term, with site management having limited negative impact. However, long-term threats from nitrogen deposition and climate change are not mitigated by current measures. Without further measures to reduce nitrogen deposition, much of the habitat is expected to be in unfavourable condition in 2035 due to nutrient overload. Future monitoring is considered critical due to the habitat's sensitivity and fragmented nature.

This first Wales-level assessment of Alpine and subalpine calcareous grasslands classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Deteriorating.

Credit: Kate Surrey



Distribution map for H6170



Range map for H6170

H6170 Habitat area and short-term trends

Surface area (km^2): 0.017

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

H6170 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Favourable (FV)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H6210 Semi-natural dry grasslands and scrublands on chalk or limestone

Semi-natural dry grasslands and scrublands on chalk or limestone are species-rich, characteristically lowland dry grasslands on calcium-rich soils over limestone bedrocks. They are characterised by calcicolous (lime-dwelling) higher and lower plant species, and range from short, open swards to moderately tall examples. In Wales, National Vegetation (Classification (NVC) communities CG1 to CG7 are included, along with some examples of CG10 and calcareous fringe habitat. For further information on Semi-natural dry grasslands and scrublands on chalk or limestone, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6210/.

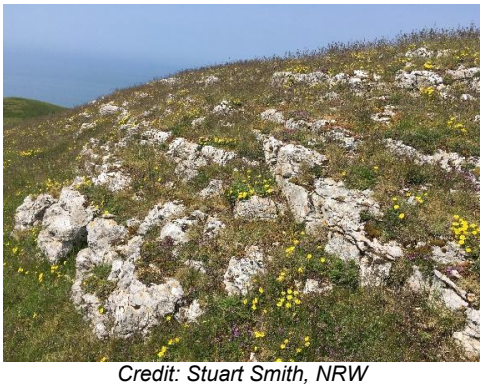
The habitat has a localised distribution in Wales, limited to the north and south, particularly coastal areas, where outcropping limestone bedrock is found. A total extent of 907.09 hectares of the habitat has been recorded. It is usually managed as pasture for sheep and sometimes other livestock; scrub-fringe examples are sometimes ungrazed. Most available data derive from surveys conducted between 1987 and 2004, with only limited updates from 2008 onward. Monitoring of 14 non-Special Area of Conservation (SAC) sites since 2007 showed slight extent loss at three sites, and more substantial reduction at one site. In 2012, habitat loss was documented at five out of 26 sites, with greater loss on non-statutory sites.

Undergrazing, abandonment of grassland management and fertiliser application are major ongoing threats. Air pollution from nitrogen deposition affects over 80% of the habitat area and is assessed as highly detrimental. Expansion of native and non-native scrub due to under-management is a key cause of poor habitat condition on statutory sites.

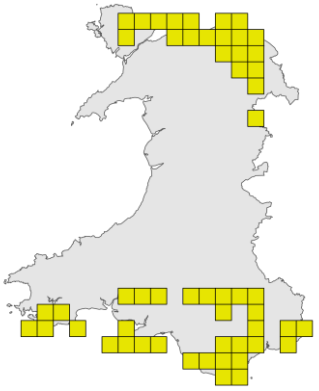
Only 36% of statutory site units have management actions completed or underway. Priority measures include control of scrub and invasive species, and adjustment of grazing practices. Less than 10% of the habitat was under agri-environment grassland options before 2023.

The habitat range is likely to decrease slightly in the next 12 years, as some parts of the range include only very small areas of unprotected habitat. Area decline is expected to continue due to persistent high-ranking pressures and limited coverage by conservation actions. High nitrogen pollution and lack of recent data suggest poor structural condition for much of the habitat.

This first Wales-level assessment of Semi-natural dry grasslands and scrublands on chalk or limestone classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.



Credit: Stuart Smith, NRW



Distribution map for H6210

Range map for H6210

H6210 Habitat area and short-term trends

Surface area (km^2): 9.0709

Area short-term trend: Decreasing

Range short-term trend: Stable

Structure and function short-term trend: Decreasing

H6210 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H6230 Species-rich *Nardus* grassland

Species-rich *Nardus* grassland is a short, species-rich grassland found on dry to slightly damp basic soils that are not highly calcareous. Examples in upland areas are primarily characterised by National Vegetation Classification (NVC) type CG10, and sometimes U5d, while lowland areas include CG10 or U4c. It is generally widespread but highly localised in the Welsh uplands, particularly in northern Eryri, and is very sparse in the lowlands. The habitat is usually maintained through pasture management, commonly extensive sheep grazing in the uplands and various livestock types in the lowlands. For further information on Species-rich *Nardus* grassland, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6230/.

The habitat has a recorded area of 137.2 hectares, and a distribution primarily based on surveys from 1979 to 2004, supplemented by later monitoring and incidental records. It is mainly located in upland areas, with relatively few lowland examples. Most localities are on protected sites, and grassland loss in uplands has been limited. There is no evidence of a change in range since the previous report, although one new site was recorded in a different 10km square. Special Area of Conservation (SAC) monitoring in 2016 confirmed the habitat's presence in north-west Wales but covered only 31% of its total area. Some recent surveys noted minor declines in lowland sites, but sample sizes were too small for definitive conclusions.

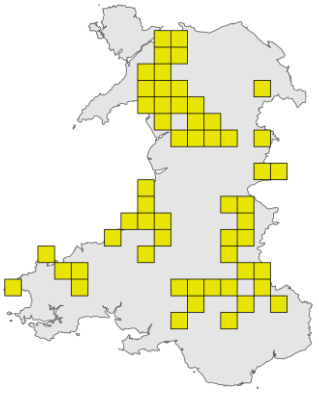
Key pressures include both overgrazing and undergrazing by livestock. Airborne nitrogen pollution affects the whole known habitat area, with all sites exceeding the critical load. Other threats include afforestation, especially to unmapped upland stands, conversion to agriculture, fertiliser application, and leisure activities. Additional, medium-ranked pressures include climate change impacts such as temperature extremes and altered precipitation, and the presence of problematic native species. While pressures are well-documented for statutory sites, they are harder to evaluate for non-statutory or unmapped upland areas.

Conservation actions include designation of 68% of the habitat as Sites of Special Scientific Interest (SSSI) and 31% as SAC. Specific SSSI management agreements cover 16% of the habitat, with actions including grazing management and disturbance reduction. Area of the habitat under Glastir Advanced schemes dropped from 50% to 3% coverage in recent years. Other measures include regulatory frameworks to control air pollution, and afforestation prevention strategies under national woodland creation policies. However, a large portion of the habitat still lacks targeted management, and a recent reassessment of measures has not been conducted.

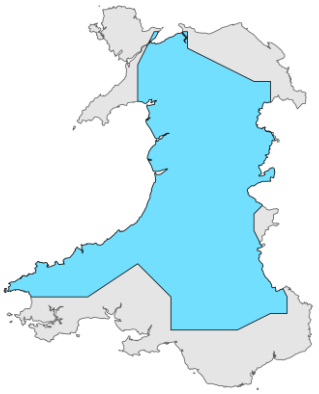
Future prospects are negative for range, area, and structure/function. Pressures such as atmospheric nitrogen deposition, overgrazing, and tree planting are expected to continue or intensify, especially for unmapped and unprotected sites. SAC monitoring indicates declining condition in some areas, but most of the habitat remains unassessed. Low Glastir coverage and the limited scope of targeted conservation measures further undermine resilience. Consequently, continued area and condition loss may reduce distribution, thereby negatively affecting the habitat's range over time.

This first Wales-level assessment of Species-rich *Nardus* grassland classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Improving.

Credit: Stuart Smith, NRW



Distribution map for H6230



Range map for H6230

H6230 Habitat area and short-term trends

Surface area (km^2): 1.372

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H6230 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H6410 *Molinia* meadows

Molinia meadows are short to medium-height grasslands dominated by purple moor grass (*Molinia caerulea*) with a significant presence of sedges and herbs. They encompass National Vegetation Classification (NVC) communities M24 and M26, and characteristic species include meadow thistle (*Cirsium dissectum)*, tawny sedge (*Carex hostiana)*, flea sedge (*Carex pulicaris*), and common quaking grass (*Briza media*). They typically occur within wet grassland mosaics along with other forms of grasslands and wet heathland, as well as at the edges of base-rich mire systems. The habitat is usually grazed by cattle or hardy equines. For further information on *Molinia* meadows, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6410/.

The habitat is widespread but only locally frequent in Wales, mainly in the west and south-west, with a total recorded extent of 515.6 hectares. Monitoring and revisits strongly suggest a recent decline in range and extent. Loss of M24 habitat was observed at 37% of sites visited between 2001 and 2012 and at 46% of sites between 1989 and 2012, with a total area loss of 40.8 ha. The average annual loss rate is uncertain but estimated below 1% per year.

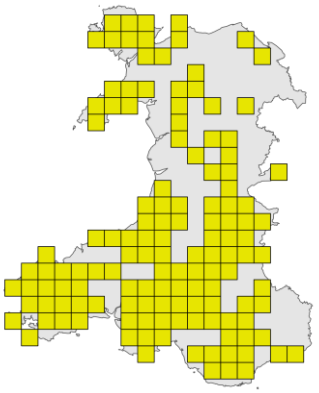
Key pressures include undergrazing, natural succession leading to scrub encroachment, and agricultural water pollution, all ranked as high severity. Airborne nitrogen pollution is also a significant issue, with 82% of the habitat exceeding critical load levels. Medium severity threats include intensive grazing, drainage for agriculture, burning, and afforestation. Non-statutory sites face additional risks such as conversion to recreational areas or housing.

About 66% of *Molinia* meadow by area lies within Sites of Special Scientific Interest (SSSIs), yet only 52% of SSSI units have active or planned management. The most common actions are adapting grazing regimes and controlling problematic native species, both highly ranked. Thematic Action Plans are in place on Special Areas of Conservation (SACs), which cover 35% of the habitat. However, only 9% of the habitat was recently covered by relevant agri-environment schemes like Glastir. Some sites have been newly notified as SSSIs or are awaiting notification.

A slow decline in range and area is expected, especially on non-statutory sites that remain vulnerable to insufficient management, drainage, and afforestation. Although some pressures, like agricultural intensification, may have declined in impact, many others persist. The condition of most of the habitat remains poor or unknown, with limited remedial action across much of the resource. Nitrogen deposition is projected to keep a significant portion of the habitat in unfavourable condition by 2035 without additional measures.

This first Wales-level assessment of *Molinia* meadows classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Stuart Smith, NRW



Distribution map for H6410

Range map for H6410

H6410 Habitat area and short-term trends

Surface area (km^2): 5.156

Area short-term trend: Decreasing

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H6410 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H6430 Tall herb communities

This habitat type occurs primarily on ungrazed upland cliff ledges, sometimes extending to open ground, and is restricted to base-rich substrates in somewhat sheltered conditions. It represents one of the few near-natural habitats remaining in Wales and acts as a refuge for rare, grazing-sensitive montane plant species. Floral composition is less rich than in Scotland but includes species such as globe-flower (*Trollius europaeus*), wild angelica (*Angelica sylvestris*), and holly-fern (*Polystichum lonchitis*), along with arctic-alpines like alpine saw-wort (*Saussurea alpina*) and black alpine-sedge (*Carex atrata*). Welsh poppy (*Meconopsis cambrica*) is also present, an example of a southern species absent further north in Britain. For further information on Tall herb communities, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6430/.

The distribution of tall herb communities in Wales was mapped using various datasets including upland National Vegetation Classification (NVC) surveys (areas of U17 community) and Phase 1 records of tall-herb habitat considered to match the description, with a revised GIS inventory completed in 2012. The estimated extent is 65 hectares, derived from 42 hectares of mapped polygons and a further 23 hectares inferred from additional point records. The distribution has not changed since the 2013 report. Survey data predate 2007, and no comprehensive monitoring has occurred since 2012, apart from a small 2017 assessment in Bannau Brycheiniog Special Area of Conservation (SAC).

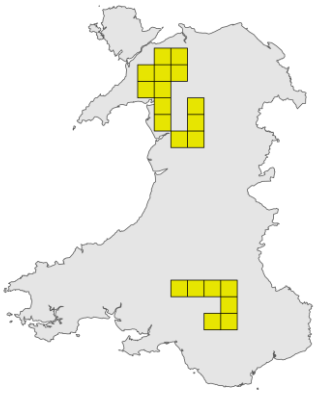
The primary pressures on the habitat include intensive grazing, especially on accessible ledges, and nitrogen deposition from air pollution, both considered to be of high impact. Moderate pressures include outdoor recreation activities such as climbing, spread of invasive non-native species like New Zealand willowherb (*Epilobium brunnescens*), and expansion of native bracken. Climate change presents an additional medium-level threat, particularly for upland species at or close to the edge of their southern range.

Conservation actions include maintaining appropriate grazing levels, managing recreation impacts, and controlling invasive native and non-native species. Approximately 35% of Site of Special Scientific Interest (SSSI) management units have actions underway or completed, with planned measures for the remainder. A significant portion of habitat outside designated sites lacks identified conservation measures. In some areas, such as Cwm Idwal, grazing exclusion has led to signs of vegetation recovery.

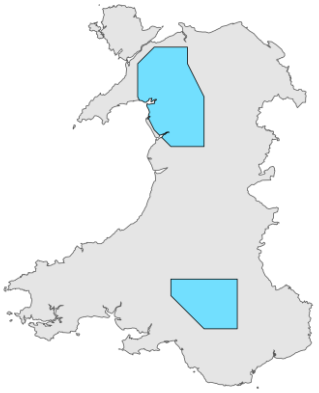
The future condition of the habitat is at risk if grazing pressure remains unmanaged. Long-term threats include continued nitrogen deposition and climate change, which may further degrade habitat diversity. Recovery is ongoing in some areas, but progress is slow and uneven. Overall future prospects are uncertain, with medium confidence based on a mix of expert judgement and limited evidence.

This first Wales-level assessment of Tall herb communities classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Improving.

Credit: Heather Garrett



Distribution map for H6430



Range map for H6430

H6430 Habitat area and short-term trends

Surface area (km^2): 0.65

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H6430 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H6510 Lowland hay meadows

Lowland hay meadows are herb-rich neutral grasslands supporting both dry-loving and damp-loving plant species, usually found on floodplains where management is summer hay cutting and soil nutrient levels are low to moderate. It includes examples of National Vegetation Classification (NVC) community MG4, characterised by species such as great burnet (*Sanguisorba officinalis*), meadow foxtail (*Alopecurus pratensis*) and meadowsweet (*Filipendula ulmaria*). Sites often experience winter flooding but have generally free-draining soils. The habitat is highly localised in Wales and mainly restricted to a few sites in the east. For further information, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H6510/.

Lowland hay meadows have been confirmed from just eight sites in Wales, with a recorded extent of 10.7 hectares. Six out of eight sites were revisited in the current reporting round, following earlier surveys between 1989 and 1999 and again from 2009 to 2012.

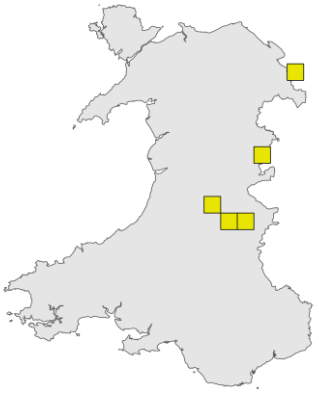
Key pressures include insufficient mowing or cutting, climate change-induced precipitation changes, atmospheric nitrogen deposition, and inappropriate drainage, all ranked as high threats. Medium-ranked threats include agricultural conversion, over- or under-grazing, fertiliser application, hydrological changes, and flooding during the growing season. Localised issues include the spread of certain native species linked to insufficient cutting or drainage.

All confirmed examples of Lowland hay meadow in Wales are statutorily protected within the Site of Special Scientific Interest (SSSI) series. Management agreements have supported appropriate conservation management on many sites, although data on current coverage is lacking. High-ranked conservation measures include preventing agricultural conversion, managing fertiliser use, adapting mowing and grazing, and restoring hydrologically impacted sites. Medium-ranked actions involve maintaining extensive agricultural practices, controlling pollution, and managing native species.

The habitat range is expected to remain stable given the high level of statutory protection, though localised losses could reduce distribution due to habitat fragmentation. Fluctuations in habitat area are likely due to floodplain dynamics, and there is limited recent monitoring. Structure and functions are at risk from nitrogen deposition and climate change, with insufficient mitigation from existing conservation measures. Much of the habitat is expected to remain in unfavourable condition by 2035 without further atmospheric nitrogen deposition mitigation.

This first Wales-level assessment of Lowland hay meadows classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Deteriorating.

Credit: Stuart Smith, NRW



Distribution map for H6510

Range map for H6510

H6510 Habitat area and short-term trends

Surface area (km^2): 0.107

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H6510 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

6.4 Heath habitats

Image credit: Bathilda Milton-Haynes, NRW

H4010 Northern Atlantic wet heaths with *Erica tetralix* (‘Northern Atlantic wet heaths’)

H4030 European dry heaths (‘Dry heaths’)

H4060 Alpine and Boreal heaths

H5130 *Juniperus communis* formations on heaths or calcareous grasslands (‘Juniper heaths’)

H4010 Northern Atlantic wet heaths

Northern Atlantic wet heaths in Wales are typically dominated by mixtures of heather species such as *Calluna vulgaris* and *Erica tetralix*, along with grasses including *Molinia caerulea* and *Trichophorum cespitosum*. Sphagnum mosses, particularly *Sphagnum compactum* and Sphagnum *capillifolium*, may also be present. The National Vegetation Classification (NVC) M15 wet heath community is the most widespread across both lowland and sub-montane upland areas, whereas the M16 community is primarily found in the lowlands of South West Wales. For further information on Northern Atlantic wet heaths, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H4010/.

The distribution of Northern Atlantic wet heaths in Wales is based on several primary data sources collected between 1979 and 2023. These include national surveys such as the Phase 1 Habitat Survey and Lowland Heathland Survey. No significant changes in 10km square distribution have occurred since the last reporting round. Losses and gains are observed at specific sites, but their balance is unclear due to insufficient data. Satellite data indicate a 3% increase in dwarf-shrub heath since 2010, although this figure does not distinguish Northern Atlantic wet heath from other heath types. Sample survey data in Snowdonia indicate a 6% loss between the 1980s and 2009–2011.

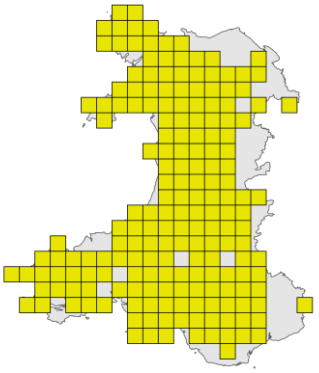
Key pressures on the habitat include inappropriate grazing, with both overgrazing and insufficient grazing management leading to scrub and bracken invasion, and air pollution – particularly nitrogen deposition. Recreation, fire, drainage, and mowing are also recorded as pressures. Threats are similarly dominated by changes in agricultural practices and nitrogen deposition. Recreational use, non-native species like rhododendron, and vulnerability to Phytophthora pathogens also pose risks. Climate change is expected to exacerbate pressures through altered precipitation and drought stress.

Conservation actions have been implemented on select sites since 2019, including management agreements, direct interventions, and consents. These target grazing, invasive species control, drainage management, and recreational impacts. Wider policy tools include the forthcoming Sustainable Farming Scheme under the Agriculture (Wales) Act 2023 and air quality measures under the new Environment (Air Quality and Soundscapes) (Wales) Act 2024. However, Glastir monitoring has shown little to no effect on habitat condition, and no large-scale heathland-specific projects are active.

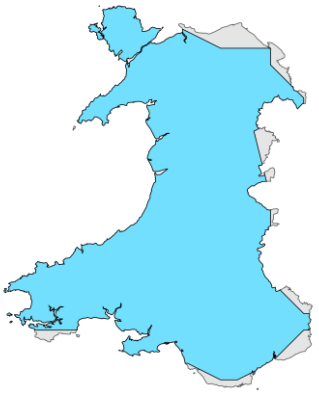
The future outlook for Northern Atlantic wet heaths is mixed. While reductions in grazing may lead to habitat gains in upland areas, structure and function remain vulnerable. Only 26% of the habitat lies within protected sites, and agricultural and land management challenges persist. Nitrogen deposition is expected to continue threatening habitat condition. Climate change, particularly increased drought and altered rainfall, poses an intensifying risk. Without additional targeted measures, much of the habitat is expected to remain in unfavourable condition due to atmospheric nitrogen deposition.

This first Wales-level assessment of Northern Atlantic wet heaths classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Deteriorating.

Credit: James Latham, NRW



Distribution map for H4010



Range map for H4010

H4010 Habitat area and short-term trends

Surface area (km^2): 144.14

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H4010 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H4030 Dry heaths

European dry heaths comprise dwarf-shrub vegetation dominated by ericoid species. In upland areas, typical species include *Calluna vulgaris*, *Vaccinium myrtillus*, and *Empetrum nigrum*, while lowland communities feature *Ulex gallii* and *Erica cinerea*. The habitat ranges from sea level to sub-montane elevations, typically on freely-draining, acidic to circumneutral soils with low nutrient content. Different National Vegetation Classification (NVC) communities represent this habitat across Wales, with H12, H18, and H21 in uplands and H8, H4, and H10 in lowland and fringe zones. For further information on Dry heaths, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H4030/.

The distribution and extent of Dry heaths in Wales are based on multiple survey datasets, the most recent GIS inventory reviewed in 2018. There is no current system for monitoring habitat changes, and available data sources are relatively dated. Losses and gains in habitat have been recorded at individual sites, but these are inconsistently documented. As a result, the short-term trend in area is considered unknown, and the distribution data have not been updated since 2013.

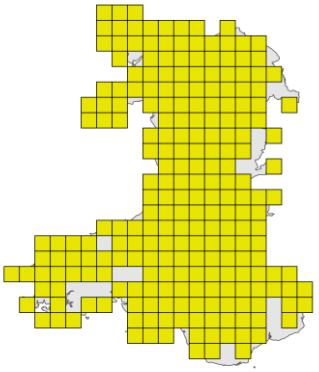
Inappropriate grazing is a widespread issue, with both undergrazing and overgrazing recorded across numerous sites. Other significant pressures include insufficient cutting, scrub and bracken invasion, recreational access impacts, and fire. Air pollution, particularly nitrogen deposition, affects all habitat areas and contributes to soil acidification. Climate change, invasive species, and potential afforestation also pose long-term threats to habitat structure and quality.

Conservation actions have been implemented on 9 sites and 71 units since 2019, including management agreements and direct interventions. These measures address grazing, invasive species control, and prevention of afforestation. National legislation is evolving, with the 2024 Environment Act and Agriculture (Wales) Act supporting air quality improvement and sustainable land management. Site-level management remains the primary mode of action, with some re-creation efforts and planning for future funding strategies in place.

The extent of Dry heaths is projected to remain stable or potentially expand in upland areas due to reduced grazing. However, only 41% of the habitat lies within protected sites, and many areas outside these lack documented management. Pressures such as wildfire, nitrogen deposition, and drought are expected to intensify and interact. Maintaining traditional practices like mowing may help mitigate impacts, but nitrogen deposition remains a pervasive threat to habitat function.

This first Wales-level assessment of Dry heaths classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Improving.

Credit: Bathilda Milton-Haynes, NRW



Distribution map for H4030

Range map for H4030

H4030 Habitat area and short-term trends

Surface area (km^2): 777.4

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H4030 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Favourable (FV)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H4060 Alpine and Boreal heaths

Alpine and Boreal heaths are a high-altitude habitat found on the mountains of north and mid Wales. Its vegetation comprises often stunted and prostrate ericoid shrubs underlain by a thick mat of the moss *Racomitrium lanuginosum*, accompanied typically by macrolichens such as *Cetraria islandica* and *Cladonia* species. Ericoid species include *Calluna*, *Empetrum nigrum* ssp. *Hermaphroditum*, and *Juniperus communis* ssp. *Nana*, with *Carex bigelowii* being especially characteristic in Wales. For further information on Alpine and Boreal heaths, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H4060/.

The distribution of Alpine and Boreal heaths in Wales was derived from mapped National Vegetation Classification (NVC) communities H14, H15, H19, H20, and H22, as well as and additional heathland vegetation that isn't represented in the NVC. The distribution is based on polygon and point records from upland NVC surveys (1996–2004) and three 10 km square records from Arenig Fach, Aran Fawddwy, and Cader Idris. A 2019 survey mapped almost all habitat areas, increasing the extent from 0.42 km² to 0.49 km² due to improved mapping, not actual expansion. Changes in the 10 km square distribution over the last 12 years are considered unlikely. Regular surveillance across the habitat's range in Wales is not currently undertaken.

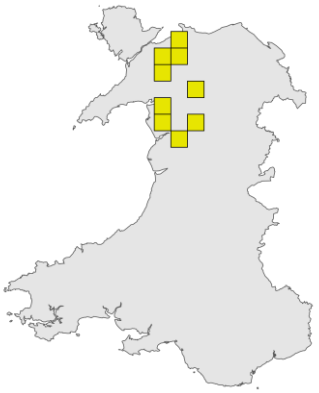
The main pressures on Alpine and Boreal heaths include inappropriate grazing, recreation, and air pollution. Inappropriate grazing is noted on multiple units, with the impact of grazing combined with nitrogen deposition identified as unsustainable. Recreational activities cause localised trampling, particularly where paths are not maintained, such as near Llyn y Cŵn, Gyderau. Air pollution, including nitrogen and sulphur deposition, impacts habitat quality, with nitrogen deposition exceeding critical loads across all sites. Future threats include climate change, which may lead to species loss and habitat erosion due to rising temperatures and altered precipitation patterns.

Few conservation actions have been completed since 2019. Air pollution is regulated by national and local legislation, including the Air Quality Standards Regulations 2010 and the Environment (Air Quality and Soundscapes) (Wales) Act 2024. These frameworks aim to set pollutant-specific targets that could support biodiversity. The Agriculture (Wales) Act 2023 introduces Sustainable Land Management objectives, potentially reducing agricultural emissions. The Eryri National Park Recreation Strategy 2022–2027 includes maintaining upland paths to mitigate erosion impacts.

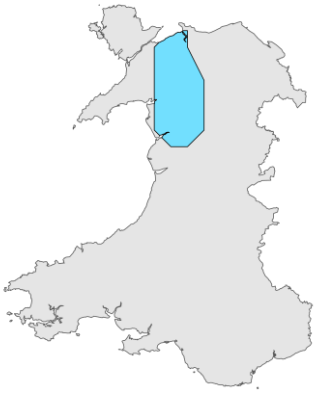
The future range of Alpine and Boreal heaths is uncertain, with potential for expansion in areas like Pumlumon if grazing is reduced, but loss remains possible in fragmented areas such as Aran Fawddwy. While grazing reduction has led to recovery in some areas, continued nitrogen deposition and recreational erosion may restrict further improvement. Nitrogen deposition is predicted to exceed critical loads until at least 2030, limiting structural and functional recovery. Climate change may drive uphill migration of the habitat, reducing the area available due to topographic constraints.

This first Wales-level assessment of Alpine and Boreal heaths classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

Credit: CCW (legacy image)



Distribution map for H4060



Range map for H4060

H4060 Habitat area and short-term trends

Surface area (km²): 0.49

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Increasing

H4060 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H5130 Juniper heaths

Juniper heaths are found on limestone outcrops in North Wales and on limestone coastal cliffs on the Gower coast. These areas are associated with floristically rich calcareous grassland, heathland, and limestone woodland. The habitat is poorly understood. It has been identified based on the presence of frequent to abundant Juniper in association with other scrub and grazing intolerant species. For further information on Juniper heaths, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H5130/.

This habitat is known from three 10km squares: SH88 and SH87 on the Creuddyn Peninsula in North Wales, and SS48 on the cliffs of the Gower Peninsula. In 2012, revisits to larger Juniper populations on Gower found no significant change in plant numbers compared to records from 2006, suggesting short-term stability. The short-term range is considered stable based on restriction to three 10km squares. However, there is no direct evidence to assess trends in the habitat's extent.

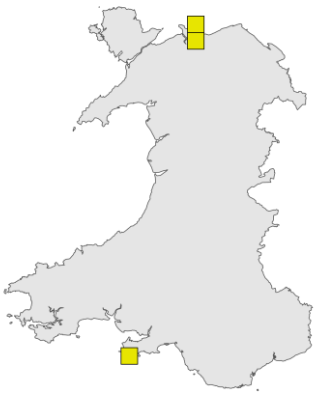
Ongoing pressures on the habitat include overgrazing and undergrazing by livestock, burning for agriculture, and invasive species such as cotoneaster. Other pressures include native species expansion, atmospheric nitrogen deposition, and increased recreational activity. Climate change is likely to affect germination rates and fire frequency, with some stands vulnerable to edge effects due to fragmentation. Pathogens like *Phytophthora austrocedrae* also pose a risk, with documented cases in Wales.

Air quality initiatives, such as the Environment (Air Quality and Soundscapes) (Wales) Act 2024 and the Agriculture (Wales) Act 2023, aim to reduce pollution and support sustainable land management. A decision-making framework exists for managing *Phytophthora* outbreaks on heathlands, which could be adapted for Juniper. The Limestone Grassland Restoration project by North Wales Wildlife Trust targets non-native cotoneaster in areas that may include the Juniper heaths habitat.

There is insufficient evidence to predict the future of Juniper heaths in Wales with certainty. While some stands may persist due to shallow soils and exposure, others require active management. All known or mapped stands are at least partially within Special Areas of Conservation (SACs), though not all are notified features, and some fall outside designated protection. Without further measures to reduce nitrogen deposition, much of the habitat is expected to remain in unfavourable condition. A long-term conservation strategy is required to achieve favourable conservation status.

This first Wales-level assessment of Juniper heaths classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: Natural England/Peter Wakely 1980



Distribution map for H5130

Range map for H5130

H5130 Habitat area and short-term trends

Surface area (km^2): 0.01

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H5130 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Unknown (XX)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

6.5 Marine habitats

Image credit: Nick Owen, NRW contracted diver

H1110 Sandbanks which are slightly covered by sea water all the time (‘Subtidal sandbanks’)

H1130 Estuaries

H1140 Mudflats and sandflats not covered by seawater at low tide (‘Intertidal mudflats and sandflats’)

H1150 Coastal lagoons

H1160 Large shallow inlets and bays (‘Bays’)

H1170 Reefs

H1180 Submarine structures made by leaking gases

H8330 Submerged or partially submerged sea caves (‘Sea caves’)

S1376-S1377 Maerl beds

H1110 Subtidal sandbanks

Subtidal sandbanks are features of five Special Areas of Conservation (SACs) in Wales. Some sandbanks are distinct seabed features characterised by mobile sediments influenced by strong tidal currents while others are extensions of shallow nearshore soft−sediment communities under more stable conditions. Macrobenthic species diversity and abundance are generally lower on distinct mobile sandbanks compared to those under more stable conditions in Wales. Sandbanks are mostly composed of sand, with some subtidal coarse sediments and mud in the more stable areas. For further information on Subtidal sandbanks, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1110/.

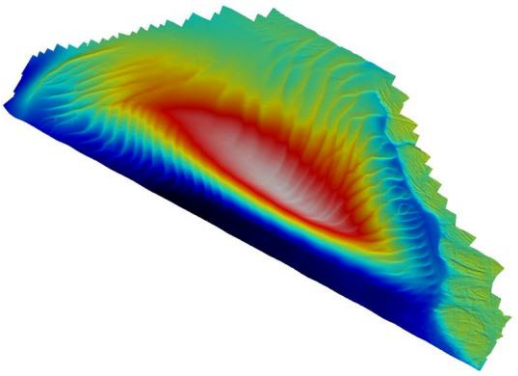
The total area of sandbanks in Wales is approximately 638 km², with around 69 % located within SACs. The calculated range includes inshore and offshore areas and was estimated using a sediment distribution dataset supplemented with areas of sandy sediments connected to the main sandbanks. There is inadequate repeat mapping to determine a trend in area or range, but it is most likely that the range and area has remained stable. Using published SAC Condition assessments supplemented with additional analysis undertaken for the Regulation 9A report, 56 % of sandbank area was assessed as being in Good condition while 12 % of sandbank area was assessed as being in Not Good condition with the rest remaining Unknown.

Identified medium ranked pressures include water pollution from mixed sources, marine litter, and climate change-related effects such as temperature increases and altered species distributions. The regional status of two commercial fish stocks (European plaice and whiting) previously recorded at sandbanks is a concern. Habitat change and changes in ecological processes in relevant species assemblages due to climate change were identified as future medium ranked pressures. Overall, confidence in the assessment of pressures is low due to limited available data and assessment.

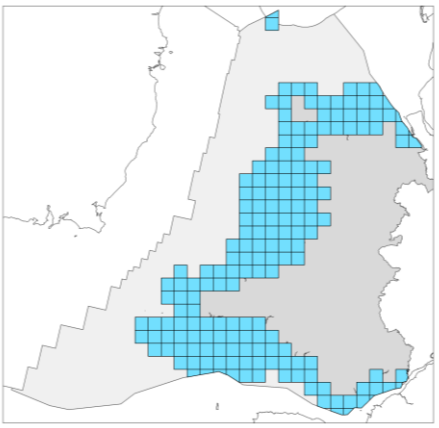
Key conservation measures identified include adaptive management of aggregate extraction, water quality regulation, fisheries management, and appropriate planning of renewable development. Marine Licensing, informed by Habitats Regulations Assessments and Environmental Impact Assessments, ensures the management of impacts of development projects and key large scale activities. This is considered to be a low confidence assessment because the ability of some of these measures to fully address known and potential pressures and threats is uncertain and the time scale is also uncertain.

The range of sandbanks is expected to remain geographically stable. However, future prospects for area and structure/function are unknown, as current assessments have low confidence and are hindered by limited data. Multiple uncertainties regarding the extent and impact of pressures, as well as the effectiveness of current conservation measures, prevent a definitive assessment of future prospects.

This first Wales-level assessment of Subtidal sandbanks classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Unknown.



Credit: Turbot Bank, NRW



Distribution map for H1110

H1110 Habitat area and short-term trends

Surface area (km²): 637.84

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H1110 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H1130 Estuaries

Estuaries in Wales range from small sediment-filled inlets to large macro-tidal systems and the deep-water Milford Haven inlet. These habitats are diverse in character in terms of tidal flow, depth and sediment type and extent. Estuaries suffer from a legacy of varied pressures from historical activities. Their sheltered environments support shellfish collection and aquaculture, which can serve as both economic assets and indicators of sediment fauna health. For further information on Estuaries, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1130/.

Estuaries are distributed throughout Wales, with over 90% included within the UK National Site Network. The overall distribution and range of the feature are considered stable, as boundaries are physiographically defined and unlikely to shift without substantial geomorphological changes. Some minor habitat losses have occurred, but do not affect the overall range.

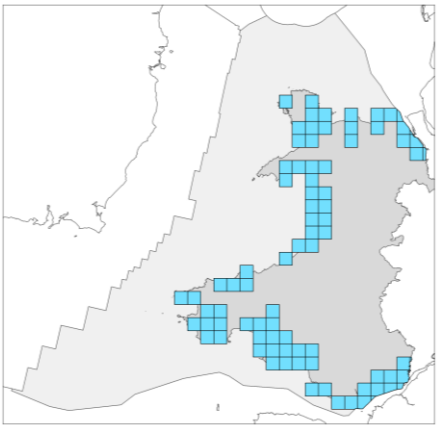
Main pressures affecting Estuaries include diffuse pollution from agriculture in their catchments, coastal development, and activities such as dredging and port expansion. These contribute to nutrient enrichment, siltation, and contamination, especially in areas like Milford Haven. Overgrazing and abandonment of saltmarsh management has led to poor vegetation structure and reduced biodiversity in some Estuaries. The regional status of a number of commercial fish stocks associated with estuaries is also of concern. Invasive non-native species, including Pacific oysters (*Magallana gigas*) and American slipper limpets (*Crepidula fornicata*), are expanding, particularly in Milford Haven. Coastal squeeze, due to sea level rise and fixed defences, continues to reduce intertidal habitat extent. Recreational activities, shipping, aquaculture, and legacy pollutants also pose ongoing and widespread risks.

Current conservation measures include water quality regulation, habitat restoration, invasive species control, and fisheries management. The National Habitat Creation Program addresses habitat loss from coastal squeeze and provides compensation for coastal development elsewhere, by promoting managed realignment. River Basin Management Plans contribute to reducing diffuse pollution from catchments. Regulations exist for marine development impacts in Special Areas of Conservation (SACs), and shellfish harvesting is managed within these protected sites. Public awareness and targeted enforcement, such as byelaws for bait digging, are part of local conservation strategies. However, only a small proportion of saltmarsh is under active agri-environment management.

Slow implementation of management plans and ongoing pressures mean that the future outlook for estuaries is poor. Habitat losses continue due to coastal development and erosion, especially outside SACs. Diffuse pollution may improve with stricter controls, but marine litter and unregulated activities remain problematic. Invasive species threats persist due to aquaculture and vessel movements. Potential impacts of future development of the aquaculture sector will be mitigated through the application of Welsh National Marine Plan Policies. Atlantic salt meadows face decline from grazing and pollution, despite protection within SACs. Coastal squeeze driven by climate change is a key overriding threat. The effectiveness of any of the current mitigation measures is limited, and confidence in the overall future condition is low.

This first Wales-level assessment of Estuaries classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Unknown.

Credit: Paul Brazier, NRW



Distribution map for H1130

H1130 Habitat area and short-term trends

Surface area (km^2): 601.907

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

H1130 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H1140 Intertidal mudflats and sandflats

Intertidal mudflats and sandflats are widespread across Wales, forming a significant proportion of the intertidal area, especially in the macro-tidal estuaries. This feature consists of open coast sandy habitats, through to the muddier sediments of inlets and estuaries. For further information on Intertidal mudflats and sandflats, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1140/.

The mapped range of intertidal mudflats and sandflats is based on surveys from 1996–2005, with an update in 2010 in Tremadoc Bay. These surveys provide a comprehensive, broadscale distribution across Wales, although some local changes will have occurred since they were mapped. The best estimate of surface area is 420 km², with minimal recorded losses amounting to 0.01%. There have been localised reductions in extent, but this does not impact the Wales-wide distribution.

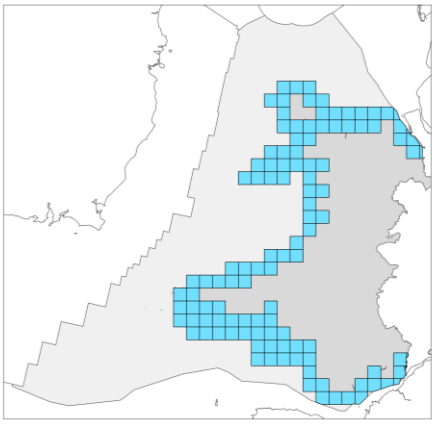
The habitat is subject to multiple ongoing and future pressures. Key threats include coastal development, marine pollution from residential, industrial and agricultural sources, and activities such as bait digging and shellfish aquaculture and collecting. The feature is especially impacted in estuarine and sheltered locations due to coastal development and water quality issues from riverine nutrient and pollutant inputs. Estuarine areas consistently fail to meet the required chemical or biological water quality standards. Existing coastal defences and infrastructure in many places restricts the realignment of the shoreline with sea level rise, resulting in habitat loss due to coastal squeeze. Additional threats stem from future energy infrastructure, recreational access, invasive alien species and climate change effects including sea-level rise and increased wave exposure.

Conservation actions include the National Habitat Creation Programme (NHCP) which addresses intertidal habitat loss from coastal squeeze, and as compensation for coastal development, by promoting coastal managed realignment. Regulations address marine development impacts, water pollution, fisheries impacts and invasive species in Special Areas of Conservation (SACs). Measures also target the management of recreational activities and the adaptation of infrastructure to mitigate habitat degradation. Regulatory enforcement in the Welsh marine environment is guided by legislation including the Marine and Coastal Access Act, the Marine Strategy Framework Directive and policies within the Welsh National Marine Plan. This includes mechanisms such as environmental assessments, marine licensing and the use of byelaws to manage specific activities.

Confidence in the habitats future condition is low due to uncertainty in its future structure and function. Ongoing pressures in localised areas, from coastal development and flood defences, continue to reduce habitat extent. There are pressures from unregulated activities such as bait digging, and issues with enforcement of regulations around vehicle use on the shore. Proposed tidal lagoon developments could cause large-scale habitat loss that would be difficult to mitigate. However, effective implementation of marine policies and improved regulation of diffuse pollution may enhance prospects over the next two decades.

This first Wales-level assessment of Intertidal mudflats and sandflats classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported as Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Unknown.

Credit: Ben Wray, NRW



Distribution map for H1140

H1140 Habitat area and short-term trends

Surface area (km²): 420
Area short-term trend: Decreasing
Range short-term trend: Stable
Structure and function short-term trend: Stable

H1140 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)
Range status: Favourable (FV)
Structure and function status: Unfavourable-bad (U2)
Future prospects status: Unfavourable-bad (U2)
Overall status: Unfavourable-bad (U2)
Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H1150 Coastal lagoons

Coastal lagoons are shallow water bodies partly or wholly separated from the sea by natural barriers, and they host species largely confined to such habitats within the UK. These habitats are rare in the UK and support distinctive communities with rare invertebrate species, emphasizing their conservation importance. Specialist species distributions vary among sites due to isolation, and each lagoon supports a unique biological community depending on its physical characteristics. Environmental conditions in lagoons are highly dynamic and include fluctuations in salinity and temperature, which are crucial for maintaining lagoon specialist populations. For further information on Coastal lagoons, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1150/.

Fifteen saline lagoons or potential lagoons have been identified in Wales, covering around 0.84 km², which represents about 1.6% of the UK lagoon resource. There has been a minor apparent loss of 0.19% of the Welsh lagoon resource from 2013 to 2025, based on limited surveys and aerial imagery. Despite minor losses in area at some sites, the overall geographic distribution of lagoons in Wales has remained stable over the past 12 years.

Elevated nutrient levels primarily from agricultural runoff are a key factor leading to unfavourable conditions in monitored lagoons. Lagoons are vulnerable to marine litter, especially plastic, which is present at most monitored sites and may impact lagoon species through ingestion or habitat alteration. Hydrological modifications, including sluice gate failures and seawater flow restrictions, have altered water quality and habitat conditions in some lagoons. Climate change pressures such as sea-level rise, increased storminess, and salinity shifts are expected to increasingly affect lagoon structure and area.

Conservation management actions taken include installing fences to restrict access, repairing lagoon infrastructure like sluice gates, and adjusting agricultural practices to limit runoff. Some lagoons have monitoring programmes in place, and site-specific measures have been implemented, but broader issues like nutrient and litter control lack comprehensive plans.

Lagoon habitat range is expected to remain stable, but overall area may decline due to climate-induced barrier shifts, with Cemlyn and Pickleridge lagoons particularly vulnerable. Future structure and function trends are assessed as negative, driven by persistent nutrient enrichment, litter, and lack of widespread mitigation efforts. Long-term sustainability will depend on improved management of local impacts such as nutrient runoff and barrier maintenance, alongside broader climate resilience strategies.

This first Wales-level assessment of Coastal lagoons classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: © Getmapping Plc and Bluesky International Limited [2021]

Distribution map for H1150

H1150 Habitat area and short-term trends

Surface area (km²): 0.834

Area short-term trend: Decreasing

Range short-term trend: Stable

Structure and function short-term trend: Decreasing

H1150 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H1160 Bays

Bays in Wales cover approximately 1,520km^2. Welsh Bay habitats are complex features mainly composed of subtidal sediments with smaller areas of subtidal and intertidal reefs and intertidal sediments. 83% of Welsh Bay area is a designated feature within Special Areas of Conservation (SACs). For further information on Bays, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1160/.

In Wales, the extent and distribution of Bays are reported as stable. While small localised changes may have occurred in intertidal range and area, the overall bay boundaries are unlikely to shift without significant geomorphological changes. Using published SAC Condition assessments supplemented with additional analysis undertaken for the Regulation 9a report the structure and function of 5 of 8 Welsh Bays were assessed as being Not Good (61%) with the remaining assessed as Good (39%).

High ranked ongoing pressures on this habitat include diffuse nutrient pollution from agriculture, point source discharges, and contaminant pollution from industrial sources. Medium ranked ongoing pressures include shipping operations (e.g. anchoring), port infrastructure development and dredging, human modification of coastline, operation of energy infrastructure and the likely impact of climate change (raised sea temperature and changes in species distributions). The regional status of a number of commercial fish stocks associated with Bays is also a concern. Medium ranked future pressures were identified as further likely impacts of climate change (including habitat change, sea level rise, likely declines in some species and changes in ecological processes), impacts of potential aquaculture expansion, cable laying and the impacts of invasive non-native species.

Identified conservation measures include regulatory controls on pollution sources, such as the Water Framework Directive (WFD) and The Water Resources (Control of Agricultural Pollution)(Wales) Regulations. Nutrient and other water quality issues may be partly addressed through specific programmes including collaborative approaches to catchment based nutrient management and local interventions. Marine Licensing, informed by Habitats Regulations Assessments, WFD Compliance Assessments and Environmental Impact Assessments, ensures the management of impacts of development projects and key large scale activities. Fisheries are managed and regulated through UK and Welsh legislation. National measures are also in place to monitor and aim to reduce spread of invasive species, reduce marine litter input and mitigate impacts of climate change. Overall, confidence in the assessment of pressures is low due to limited available data.

The future outlook for Bays is considered stable with low confidence. While distribution and extent are expected to remain unchanged, the time required for recovery of structure and function is uncertain. Key conservation measures relating to this habitat type have been taken, are under investigation or being planned to some degree. However, there are still measures which need to be identified and implemented. This is likely to take time due to the persistent nature of the pressures, complexity and scale of the issues and the dynamic nature of marine ecosystems.

This first Wales-level assessment of Bays classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall habitat trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: NRW

Distribution map for H1160

H1160 Habitat area and short-term trends

Surface area (km^2): 1,520.07

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H1160 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H1170 Reefs

Reefs in Wales are important and diverse habitats comprising biologically derived (biogenic) reefs and stony or rocky reefs. They form a substantial proportion of the intertidal, shallow-subtidal and offshore areas of Wales, including many inshore Special Areas of Conservation (SACs). For further information on Reefs, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1170/.

The combined area of inshore and offshore reef in Wales is 3,411 km². The vast majority of which is rocky reef (99.4%), whilst biogenic reef makes up only 0.6% of this total. Inshore reefs, those within 12 nautical miles from land, represent the largest area of Welsh reef, with 3130 km² of rocky and 22 km² of biogenic reef. In the offshore, reefs cover 259 km² and as far as we know only include rocky reef, although less is known about this area. Horse mussel (*Modiolus modiolus*) biogenic reefs have declined by 61% since 2005, with 50% of this loss thought to have occurred between 2015 and 2024. Small intertidal reef losses have also occurred incrementally due to coastal development and protection works.

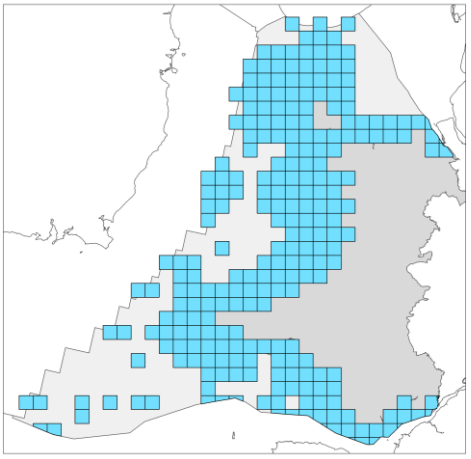
Fishing as a pressure is considered high according to JNCC's methodology, due to there being a >25% spatial overlap of assumed fishing activity with the feature. JNCC's analysis indicates a spatial overlap of 72% with offshore reef and 67% with inshore reef. Further NRW analysis of moderate and high assumed fishing activity indicates a 39% spatial overlap with offshore reef and 7.4% with inshore reef. Welsh Government's scallop fishing analysis indicates a spatial overlap of 2.3% from assumed scallop fishing activity with inshore reef calculated from cells with >500 Vessel Monitoring System (VMS) pings over a 10 year period. There are medium-impact pressures from nutrient and contaminant pollution from agriculture, urban runoff, and marine sources. Climate change contributes medium pressure through warming seas and species distribution shifts, which especially threatens sensitive biogenic reefs. Additional medium pressures include renewable energy development, coastal modification, and invasive non-native species, while several lower impact threats are also recorded.

High-ranking measures include management of commercial fishing and marine pollution, regulation of construction impacts, and reduction of mixed-source pollution. Fisheries management is guided by the Fisheries Act 2020 and implemented through Fishery Management Plans and habitat impact assessments. Pollution control is delivered via River Basin Management Plans under the Water Framework Directive and national initiatives targeting marine litter and waste reduction. Medium-level measures focus on climate change mitigation, invasive species management, aquaculture regulation, and coastal habitat restoration through initiatives such as the National Habitat Creation Programme and Wales Coasts and Seas Partnership (CaSP Cymru).

Prospects for reef habitat are considered poor due to continued pressure from fishing, development, and climate change. Diffuse pollution could decline if regulatory controls are enforced. Climate warming poses a significant threat to Modiolus biogenic reefs, potentially leading to further loss. While safeguards exist in marine planning and SACs, voluntary compliance and enforcement remain critical to halting decline.

This first Wales-level assessment of Reefs classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Unknown.

Credit: Matt Doggett



Distribution map for H1170

H1170 Habitat area and short-term trends

Surface area (km²): 3411

Area short-term trend: Decreasing

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H1170 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Unknown (XX)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H1180 Submarine structures made by leaking gases

Submarine structures made by leaking gases in Wales primarily refer to methane-derived authigenic carbonate (MDAC) reefs. These formations occur through microbial consumption of methane by anaerobic archaea and sulfate-reducing bacteria, which precipitate carbonate minerals like aragonite and high-magnesium calcite. The resulting hard substrata form complex three-dimensional reef-like habitats that support sponges, corals, bryozoans, and various demersal and mobile fish species. These reefs are ecologically important due to their stability, their support of biodiversity, and their role in carbon sequestration by locking methane-derived carbon into the seabed. For further information on Submarine structures made by leaking gases, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H1180/.

In Wales, MDAC reefs are mainly located offshore in the Croker Carbonate Slabs Special Area of Conservation (SAC), which constitutes 99.85% of the national resource, with an estimated area of 58 km². The inshore component around Holden's Reef in Pen Llŷn a'r Sarnau SAC comprises only 0.036 km², representing 0.15% of the total area. These inshore features are unique within the UK for being located in shallow, photic environments. There are no real trend data for the overall range due to challenges with detection, though both inshore and offshore extents are considered stable.

MDAC reefs face various pressures and threats, primarily from fishing and climate change. Offshore reefs are highly sensitive to demersal fishing, with activities like trawling and pot fishing posing risks of physical damage and abrasion. Climate-related threats include ocean acidification, rising sea temperatures, and changes in species distributions. Inshore reefs are exposed to static fishing, where pot hauling can result in surface abrasion. The shallow fragile reef is also vulnerable to increased wave exposure due to climate change. Additionally, pollution from mercury and polybrominated diphenyl ethers (PBDEs) has been detected in the Cardigan Bay North waterbody, potentially impacting microbial communities vital for MDAC formation.

Several conservation measures have been identified, though implementation varies. Offshore, measures to restrict damaging fishing practices in Croker Carbonate Slabs SAC were proposed under the EU Joint Recommendation process but remain unadopted post-Brexit. Inshore, fishing gear restrictions and chemical pollution investigations under the Water Framework Directive have been initiated. Broader climate mitigation actions include habitat restoration projects and carbon reduction strategies, such as Wales' Net Zero plan and River Basin Management Plans. The sensitivity of MDAC reefs suggests that recovery from impacts may take decades.

Future prospects for submarine structures made by leaking gases in Wales remain uncertain due to limited monitoring data and unknown favourable reference values. While some protective measures are in place, their effectiveness has not been fully assessed. Short- and medium-term pressures from fishing and climate change could affect MDAC stability, necessitating adaptive management. Nevertheless, with continued monitoring and proactive conservation, the outlook is cautiously optimistic, contingent on robust policy enforcement and pollution control.

This first Wales-level assessment of Submarine structures made by leaking gases classifies their overall conservation status as Unknown. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unknown status.

Credit: Nick Owen (NRW contracted diver)

Distribution map for H1180

H1180 Habitat area and short-term trends

Surface area (km²): 58.115

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

H1180 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Unknown (XX)

Structure and function status: Favourable (FV)

Future prospects status: Unknown (XX)

Overall status: Unknown (XX)

Overall trend: NA

For full supporting evidence, see the searchable table of detailed reports.

H8330 Sea caves

Sea caves occur along many parts of the rocky Welsh coastline and are present within five Special Areas of Conservation (SACs). They also occur at sites such as Holy Island and Strumble Head. The inaccessible nature of many caves limits available data, especially for deeper or submerged examples. Where accessible, limited recreational use occurs, including climbing and coasteering, though many caves are believed to be largely unimpacted by direct human activity. For further information on Sea caves, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H8330/.

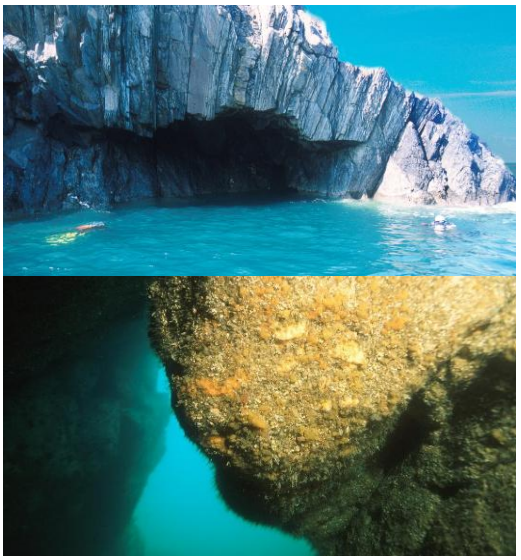
There has never been an exhaustive survey of sea caves in Wales, and only a small number have been studied in detail. Distribution is therefore based on opportunistic and potentially incomplete records collected since 1975. No new data has been collected since the previous reporting round, and no evidence of cave losses was identified during the current reporting period. The short-term trend is therefore based on expert judgment with low confidence. Long-term trends suggest a historical decline, though the current distribution at the 10 km² scale is believed to be unchanged since 1989.

Marine and coastal water pollution from mixed sources, including agricultural and industrial activities, is a major ongoing pressure. Specific contaminants such as mercury, Polybrominated Diphenyl Ethers (PBDEs), and dissolved inorganic nitrogen (DIN) have caused waterbody classification failures. Marine litter, particularly in caves with internal beaches, poses risks to species such as grey seals. Climate change introduces multiple pressures, including temperature extremes, altered species distributions, and food web shifts. Future risks include cave loss due to coastal defence and infrastructure works, as well as impacts from tourism, air pollution, and invasive species, although evidence on several of these pressures remain uncertain.

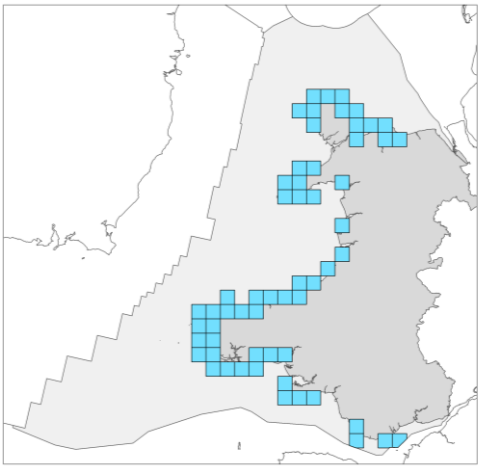
Conservation actions include regulatory frameworks addressing diffuse and marine pollution through directives such as the Water Framework Directive and UK Marine Strategy. These are implemented via River Basin Management Plans and supported by initiatives like the Wales Clean Seas Partnership and the Environmental Protection Act. Management also includes guidance for recreational activities to protect fragile biological cave communities. Measures targeting transport and development impacts, such as environmental assessments and Shoreline Management Plans, are in place, though some remain unimplemented. Broader climate and habitat restoration strategies support marine resilience.

Future prospects for sea caves in Wales suggest gradual improvement, contingent on effective implementation of existing measures. If regulatory controls are maintained and improved, diffuse pollution from agricultural and industrial sources may show improvement in the near future. The projected impacts of sea level rise and wave exposure due to climate change are not expected to significantly affect sea caves or their biological communities in the near term. Adherence to coastal management strategies may also reduce habitat losses from infrastructure development.

This first Wales-level assessment of Sea caves classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-inadequate status. The overall habitat trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.



Credit: Rohan Holt



Distribution map for H8330

H8330 Habitat area and short-term trends

Surface area (km²): 0.0726

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H8330 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Favourable (FV)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

S1376-S1377 Maerl beds

Maerl beds are a new habitat feature. Previously, for Article 17 reporting, maerl was reported separately as two species: S1376 *Lithothamnium coralloides*; and S1377 *Phymatolithon calcareum*. The Maerl bed in Milford Haven consists of a mosaic of living and dead maerl on fine sandy sediments, with fossil maerl found in deeper layers. Identification of the various maerl species is difficult, and previous field identifications have been inaccurate. Recent molecular research shows most Milford Haven specimens are mainly *L. corallioides* rather than *P. calcareum*. Maerl is nationally scarce and supports diverse flora and fauna including uncommon algae endemic to maerl. For more information on Maerl beds, see the JNCC habitat description: https://mhc.jncc.gov.uk/biotopes/jnccmncr00001554.

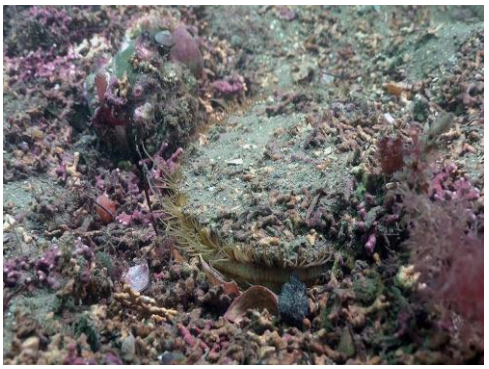
The maerl habitat In Wales is largely confined to Milford Haven, with smaller, isolated records near the Tudwal Islands on the Llŷn Peninsula. Surveys in 2023 confirmed a maerl bed at East Tudwal Island, although its extent remains unknown. The most recent systematic survey of live maerl in Milford Haven using dropdown video in 2023 estimated the minimum area at 6,587 m². Over the long term, the live maerl area has declined by 71%, from 22,537 m² in 2005 to 6,587 m² in 2023.

Major pressures on the maerl bed include invasive species such as *Crepidula fornicata*, shipping activity, agricultural runoff, and pollution from industrial and energy sources. *C. fornicata* disrupts maerl beds by increasing sedimentation and clogging spaces between maerl thalli. Additional pressures include climate-related changes affecting temperature, precipitation, and ocean chemistry.

Conservation measures include pollution control under the Water Framework Directive and voluntary agreements to restrict anchoring in maerl habitats. Dredging operations are regulated by environmental assessments and strategy documents to mitigate impacts on maerl beds. Scallop dredging is prohibited in Milford Haven under current fishing regulations.

Future prospects for Welsh maerl beds are poor due to persistent pressures, complex causes of decline, and slow maerl growth rates. Without recovery, Milford Haven and East Tudwal beds may no longer qualify as maerl habitats.

This first Wales-level assessment of Maerl beds classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unknown status. The overall habitat trend in Wales is assessed as Stable, while it was not required to report the trend in the previous UK-level evaluation due to the Unknown status.



Credit: NRW

Distribution map for S1376-S1377

S1376-S1377 Habitat area and short-term trends

Surface area (km^2): 0.006592

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Stable

S1376-S1377 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

6.6 Upland habitats

Image credit: Barbara Jones, CCW

H8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) ('Siliceous scree')

H8120 Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii)* ('Calcareous scree')

H8210 Calcareous rocky slopes with chasmophytic vegetation ('Calcareous rocky slopes')

H8220 Siliceous rocky slopes with chasmophytic vegetation ('Siliceous rocky slopes')

H8240 Limestone pavements

H8310 Caves not open to the public

H8110 Siliceous scree

Siliceous scree is formed where fragments of siliceous rocks such as quartzite, granite, and sandstone accumulate below cliffs and on frost-shattered mountain summits. These screes can occur at any altitude, but only upland screes are included in the Annex I habitat definition. In Wales, this habitat typically supports pioneer species and provides microhabitats for species sensitive to frost, humidity, or grazing, such as parsley fern (*Cryptogramma crispa)*, Wilson's filmy-fern (*Hymenophyllum wilsonii*), and stone bramble (*Rubus saxatilis*). Most of the habitat is associated with the U21 *C. Crispa – Deschampsia flexuosa* community, although other forms dominated by bryophytes and lichens are present but not described in the National Vegetation Classification (NVC). For further information on Siliceous scree, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H8110/.

The habitat is mapped from uplands in north Wales where *C. Crispa* occurs within siliceous scree above agricultural enclosures. Distribution was derived from surveys conducted between 1979 and 2002 and used to create a GIS inventory in 2012, which is considered incomplete. An estimated 316.51 ha of habitat exists, with a potential upper limit of 3,000 ha. There is no quantitative evidence to assess changes in range or surface area over the short or long term.

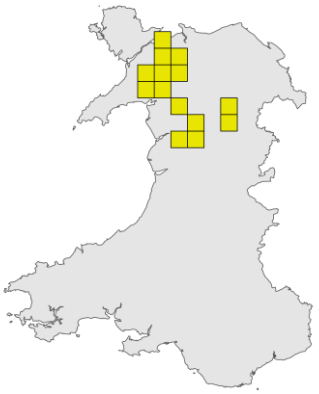
Main pressures on the habitat include overgrazing by livestock, particularly goats and sheep, outdoor recreational activities causing localised erosion, and air pollution, particularly nitrogen deposition. Threats include ongoing grazing outside controlled areas, continued recreational pressure, air pollution impacts persisting despite reduced deposition, potential bracken expansion, and climate change affecting upland species. All these factors are expected to remain or intensify, with upland species at the southern edge of their distribution likely being most vulnerable.

Key conservation actions include maintaining appropriate grazing through agreements, which currently cover a portion of the mapped habitat. Efforts to manage footpaths and control erosion are in place through work by the National Trust and National Park Authorities. Airborne emissions are addressed through various regulations, though further action is needed to reduce nitrogen to safe levels. Strategic approaches target bracken and feral goats.

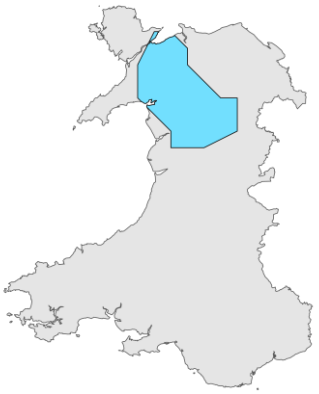
Natural Resources Wales currently lacks a specialist for this habitat, preventing any prediction regarding changes in its area or structure and function over the next twelve years. However, it is considered unlikely that the overall range will change.

This first Wales-level assessment of Siliceous scree classifies its overall conservation status as Unknown. Although not directly comparable, the previous UK-wide assessment (2019) also reported the status as Unknown. The overall habitat trend does not need to be reported when the overall status is Unknown.

Credit: CCW (legacy image)



Distribution map for H8110



Range map for H8110

H8110 Habitat area and short-term trends

Surface area (km^2): 3.17

Area short-term trend: Unknown

Range short-term trend: Unknown

Structure and function short-term trend: Unknown

H8110 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Unknown (XX)

Structure and function status: Unknown (XX)

Future prospects status: Unknown (XX)

Overall status: Unknown (XX)

Overall trend: NA

For full supporting evidence, see the searchable table of detailed reports.

H8120 Calcareous scree

Calcareous scree occurs on frost-shattered summits and slopes below cliffs, where fragments of limestone, calcareous-schists, and basic igneous rocks accumulate. The vegetation includes calcicolous (lime-dwelling) and basiphilous (alkaline-loving) species, with species composition influenced by altitude. Species at high altitude include purple saxifrage (*Saxifraga oppositifolia*), holly-fern (*Polystichum lonchitis*), and alpine meadow-grass (*Poa alpina*), while at lower altitude, limestone fern (*Gymnocarpium robertianum*), herb-robert (*Geranium robertianum*), and wall lettuce (*Mycelis muralis*) are more common. A large number of calcicolous mosses occur in the habitat. For further information on Calcareous scree, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H8120/.

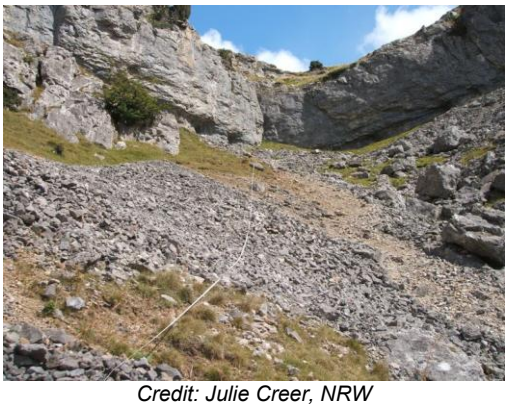
Calcareous scree is a rare habitat in Wales, primarily found in the Bannau Brycheiniog and Clwyd uplands. The estimated habitat area ranges from a minimum of 34.3ha to a potential maximum of 60ha, with 27.2ha mapped at Eglwyseg and Llangatwg, and an additional 7.1ha inferred from eight point records. Monitoring at Berwyn and South Clwyd Mountains Special Area of Conservation (SAC) shows the habitat is in unfavourable condition and this accounts for over half the known Welsh resource.

Key pressures include overgrazing, mixed-source air pollution, and atmospheric nitrogen deposition, which may contribute to species indicative of disturbance and nutrient enrichment. Moderate pressures include spread of bracken and scrub, outdoor recreation leading to erosion, and invasive cotoneaster.

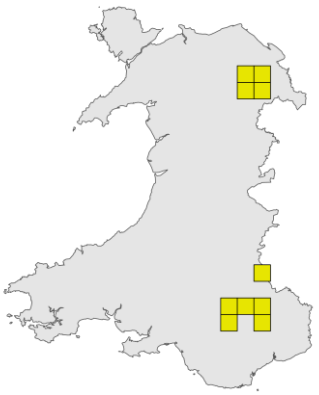
Conservation efforts have included grazing management through Site of Special Scientific Interest (SSSI) agreements covering 97% of mapped polygons and 25% of points, though scree-specific targeting is lacking. Control of invasive species such as cotoneaster and native scrub and bracken is ongoing. Path management is being implemented to reduce erosion, notably on the Offa's Dyke Footpath at Eglwyseg Escarpment. Nitrogen emissions are regulated nationally and locally, but further action is needed to reduce deposition and understand its impact.

Better management of grazing and recreational activities would aid recovery of the habitat, particularly at Eglwyseg. Monitoring and controlling non-native cotoneaster is crucial to prevent it from becoming a major issue. The long-term effects of nitrogen deposition and climate change remain poorly understood for this habitat.

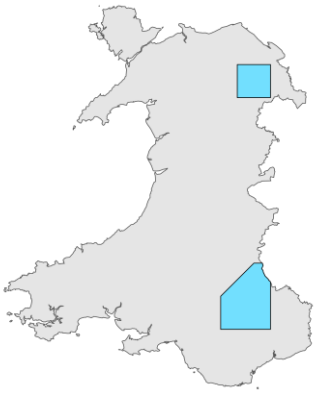
This first Wales-level assessment of Calcareous scree classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.



Credit: Julie Creer, NRW



Distribution map for H8120



Range map for H8120

H8120 Habitat area and short-term trends

Surface area (km^2): 0.47

Area short-term trend: Unknown

Range short-term trend: Unknown

Structure and function short-term trend: Uncertain

H8120 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Unknown (XX)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H8210 Calcareous rocky slopes

This habitat includes plant communities occupying cracks and fissures in lime-rich cliffs and rock faces. Vegetation is characterised by bryophytes such as *Tortella tortuosa*, *Anoectangium aestivum* and *Ctenidium molluscum*. Associated vascular plants include brittle bladder-fern (*Cystopteris fragilis*), green spleenwort (*Asplenium viride*) and glaucous meadow-grass (*Poa glauca*). The habitat occurs on base-rich rocks across uplands and lowlands in both north and south Wales. For further information on Calcareous rocky slopes, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H8210/.

The current distribution of the habitat in Wales is relatively poorly understood and lacks routine monitoring. The range is considered likely to have remained stable since 2007. The habitat has been confirmed in the field only on Special Areas of Conservation (SACs) monitored between 2007 and 2012: Eryri, Bannau Brycheiniog and Cadair Idris. No reliable figure for extent is available as the habitat has not been mapped.

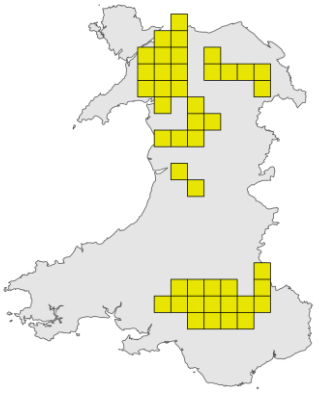
Key pressures include overgrazing by livestock, with high grazing impact recorded in certain SACs. Other pressures include outdoor sports such as rock and ice climbing, and invasion by bracken, scrub, and non-native species like cotoneaster. Air pollution and atmospheric nitrogen deposition are significant pressures, with unclear impacts on sensitive flora. Climate change and natural succession are additional identified threats.

Conservation measures include grazing management in selected areas, despite the absence of habitat-specific agreements. Native and non-native invasive species are managed, including bracken and cotoneaster, as well as feral goats in Eryri. Recreational activities are addressed through publicity and voluntary climbing restrictions in some locations. Atmospheric nitrogen impacts are monitored, but no specific mitigation actions are known.

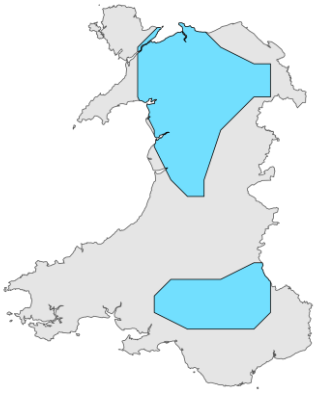
The overall range is unlikely to change within the next 12 years. Due to the absence of a habitat specialist at NRW, trends in area and structure/function over the next twelve years cannot be predicted.

This first Wales-level assessment of Calcareous rocky slopes classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Improving.

Credit: Barbara Jones, CCW



Distribution map for H8210



Range map for H8210

H8210 Habitat area and short-term trends

Surface area (km^2): 2.7

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H8210 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H8220 Siliceous rocky slopes

Siliceous rocky slopes with chasmophytic vegetation (plant communities that colonise the cracks and fissures of rock faces) are restricted to inland cliffs and steep rocky slopes in both upland and lowland areas of Wales. The habitat includes vegetation that may be classified under National Vegetation Classification (NVC) communities such as U18 *Cryptogramma crispa – Athyrium distentifolium* and U21 *Cryptogramma crispa – Deschampsia flexuosa*. Common bryophytes and vascular plants include *Amphidium mougeotii*, *Racomitrium* species, *Deschampsia flexuosa*, and *Huperzia selago*. It may occur alongside calcareous-rocky slope habitats where acid and lime-rich rocks are found together. For further information on Siliceous rocky slopes, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H8220/.

The distribution of this habitat in Wales was predicted using 10km square records of species such as *Asplenium septentrionale*, *A. trichomanes* subsp. *Trichomanes*, and *Cerastium arcticum*. These records were derived from the atlas of the British and Irish flora and used to produce a GIS inventory. The data set is partial, and lowland examples have been under-recorded. No changes in 10km square records have been made since the 2013 report, and NRW lacks a monitoring system to detect range changes.

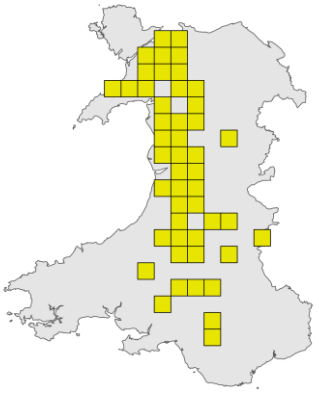
The main ongoing pressures Ie intensive grazing, outdoor recreational activities like cliff climbing, and air pollution from nitrogen deposition. Problematic native species such as bracken and scrub, and invasive non-native species including *Epilobium brunnescens* and conifer seedlings also pose threats. Natural succession and feral goats contribute additional pressure in areas like Eryri. Visitor numbers have risen, especially on paths like those on Yr Wyddfa, and these trends are expected to persist or increase.

Conservation efforts focus on managing grazing levels, including targeted reductions in sites like Cwm Idwal. There are measures to control native problem species such as bracken and manage invasive non-natives and feral goats. Recreational impacts are addressed through publicity and voluntary agreements to limit damage from activities like ice climbing. Monitoring and efforts to reduce nitrogen deposition are also in place.

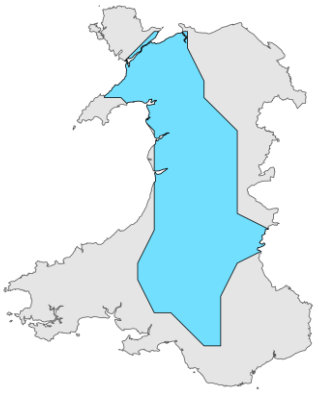
There is insufficient specialist expertise within NRW to predict future trends in range, area, or habitat condition. However, Special Area of Conservation (SAC) monitoring indicates that with control of grazing and recreational pressures, recovery is possible. Uncertainties remain regarding the long-term impacts of nitrogen deposition and climate change on this habitat.

This first Wales-level assessment of Siliceous rocky slopes classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: Barbara Jones, CCW



Distribution map for H8220



Range map for H8220

H8220 Habitat area and short-term trends

Surface area (km^2): 12

Area short-term trend: Unknown

Range short-term trend: Unknown

Structure and function short-term trend: Unknown

H8220 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Unknown (XX)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unknown (XX)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H8240 Limestone pavements

Limestone pavements are found on outcropping Carboniferous limestone and are noted for their geological and biological significance. The vegetation includes a diverse mix of vascular plants, bryophytes, and lichens, with composition varying based on location, altitude, tree cover, and grazing pressure. Woodland and wood-edge species often inhabit the sheltered grikes (deep fissures or cracks), while the clints (blocks of exposed limestone) support rocky habitat species or remain bare. Scrub can develop in the absence of grazing, with epiphyte-rich scrub particularly notable in oceanic areas. For further information, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H8240/.

The recorded area of the habitat is 77.73 hectares. It was confirmed in six 10 km squares in the Brecon Beacons in 2007, and in six 10 km squares in north Wales during the previous reporting round. Revisits in 2023 to sites previously mapped in 1975 refound the habitat at 22 out of 23 of them. These visits confirm the habitat's presence in 52% of Welsh 10 km squares between 2007 and 2012. Despite some long-term losses, there is no indication of recent change in range or area.

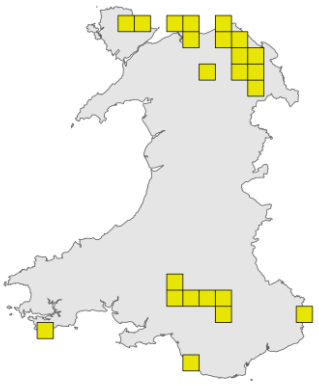
The most significant pressures include overgrazing, air pollution from nitrogen deposition, and natural succession. Overgrazing has been observed to cause increased grass cover and enrichment, while 96% of the habitat area experiences atmospheric nitrogen levels exceeding the provisional critical load. Natural succession, such as scrub and tree encroachment, has been linked to a decline in species richness. Moderate pressures include fertilisation and mineral extraction, with historical losses to quarrying noted.

The main conservation measures involve adapting grazing to prevent overgrazing and successional change, managing fertiliser use, and controlling scrub and tree encroachment. Grazing is widely used to maintain open conditions, with some tree clearance on woodland sites. While Sites of Special Scientific Interest (SSSI) legislation, Regionally Important Geodiversity Sites (RIGS) designation, and Environmental Impact Assessment (Agriculture) Regulations offer varying levels of protection, no Limestone Pavement Orders exist in Wales, leaving areas outside statutory protected sites vulnerable to rock removal.

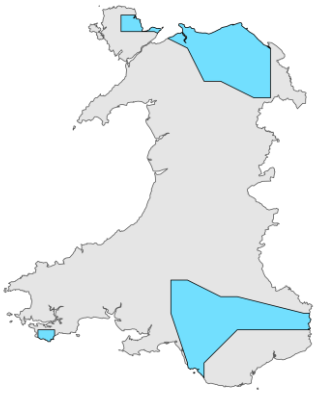
Both the range and area of limestone pavement habitat in Wales are considered currently stable. However, overall habitat condition appears poor, particularly in southern areas affected by overgrazing and nutrient enrichment. Nitrogen deposition levels remain high in upland sites, and unmanaged areas face loss of open pavement due to scrub encroachment. These issues are unlikely to be resolved in the near future.

This first Wales-level assessment of Limestone pavements classifies their overall conservation status as Unfavourable-inadequate. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

Credit: Stuart Smith, NRW



Distribution map for H8240



Range map for H8240

H8240 Habitat area and short-term trends

Surface area (km^2): 0.7773

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H8240 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-inadequate (U1)

Overall status: Unfavourable-inadequate (U1)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H8310 Caves not open to the public

Caves of habitat type H8310 are formed through long-term natural geological processes, with overall cave length unable to be increased by artificial means. These caves are characteristic of limestone regions in north and south Wales. Species recorded in Welsh caves include the crustaceans *Proasellus cavaticus*, *Crangonyx subterraneus*, *Niphargus aquilex*, *Niphargus fontanus* and *Microniphargus leruthi*, and the spider *Porrhomma rosenhaueri.* Exploration continues to reveal new cave passages, although the rate of discovery is not documented. For further information on Caves not open to the public, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H8310/.

This habitat occurs within seventeen 10km squares across Wales. Two Special Areas of Conservation (SACs) – Usk Bat Sites and Limestone Coast of South West Wales – contain cave habitats associated with this feature, though designated primarily for bats. The range of this habitat is considered stable over both short and long terms. Although new passages are occasionally discovered, they have not significantly altered the habitat's overall range.

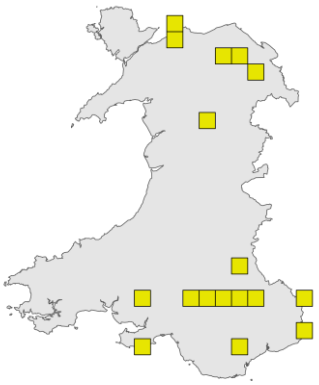
Key pressures include recreational caving and tourism, which can impact cave ecosystems through increased CO_2, artificial lighting, and altered cave microclimates. Quarrying and mining activities may change sediment loads, hydrology, and water quality within caves. Agricultural pollution and groundwater contamination pose direct threats to cave fauna and hydrological conditions. Other threats include waste disposal emissions and climate change-induced alterations to precipitation and water levels.

Relevant measures include agri-environment schemes aimed at reducing agricultural pollution, and recreational management strategies within SACs and Sites of Special Scientific Interest (SSSIs). However, these designations primarily target species and geological features, not specifically the cave habitat. Actions under the Water Framework Directive also contribute to addressing aquatic pollution and abstraction. Despite some coverage, direct conservation measures for Caves not open to the public remain limited due to poor understanding of the habitat.

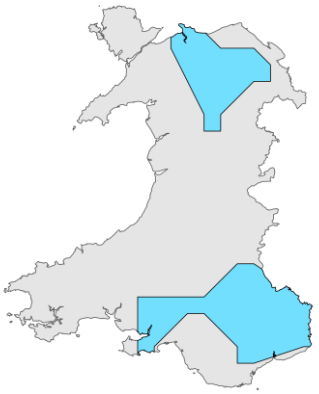
Natural geological processes continue to shape this habitat, but biological factors such as water quality and recreational pressures present ongoing risks. Impacts on species, including bats and aquatic cave fauna, are linked to changes in nutrients, pollutants, and sediment input. While exploration linked to recreation may enhance habitat knowledge and protection, confidence in future assessments remains low due to sparse data. Overall, the outlook is constrained by both biological vulnerability and limited evidence.

This first Wales-level assessment of Caves not open to the public classifies their overall conservation status as Favourable. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Favourable status. The overall habitat trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: NRW



Distribution map for H8310



Range map for H8310

H8310 Habitat area and short-term trends

Surface area (km^2): NA

Area short-term trend: Stable

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H8310 Favourable conservation status and trend

Area status: Favourable (FV)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Favourable (FV)

Overall status: Favourable (FV)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

6.7 Wetland habitats

Image credit: Peter Jones, NRW

H7110 Active raised bogs

H7120 Degraded raised bogs still capable of natural regeneration ('Degraded raised bogs')

H7130 Blanket bogs

H7140 Transition mires and quaking bogs

H7150 Depressions on peat substrates of the *Rhynchosporion* ('Depressions on peat substrates')

H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* ('Calcareous fens')

H7220 Petrifying springs with tufa formation (*Cratoneurion*) ('Petrifying springs with tufa')

H7230 Alkaline fens

H7240 Alpine pioneer formations of the *Caricion bicoloris-atrofuscae* ('Alpine pioneer formations')

H7110 Active raised bogs

Active raised bogs form where peat accumulates enough to isolate the mire surface from terrestrial sources of water, making them dependent solely on rainfall. Many bogs originate from preceeding swamp and fen phases, with peat development marking the rain-fed (termed ombrogenous) phase of mire evolution. They commonly occur in flat, poorly drained landscapes, particularly those with impermeable tills and clays which promote water-logging. Active raised bogs support oligotrophic mosses, *Eriophorum vaginatum*, and ericoids, with these and other species comprising National Vegetation Classification (NVC) communities such as M17-M18, and are characteristically treeless except in marginal areas. For further information on Active raised bogs, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7110/.

Active raised bogs have been recorded from approximately 45 sites across Wales. The current best estimate of the extent of Active raised bogs in Wales is 1588.6 ha. There is no evidence of any recent contraction in range, but sites are known to have been lost over the last 1000 years due primarily to peat cutting and agricultural reclamation: afforestation is likely to have caused more recent losses.

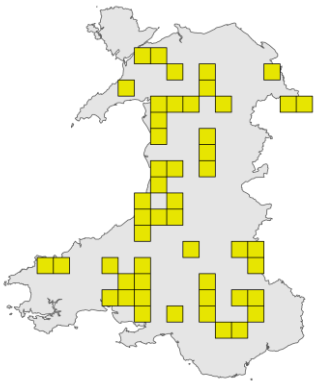
Primary pressures include the hydrological impacts of drainage, over- and under-grazing, and scrub invasion, often linked to under-management and nutrient deposition. Air pollution, especially nitrogen deposition, affects the entire known area of this habitat in Wales. Legacy impacts from agricultural conversion and peat extraction continue to degrade habitat quality and hydrology.

The LIFE Welsh Raised Bogs project implemented primarily hydrological actions benefiting approximately 730.5 ha of Active raised bogs across six Special Area of Conservation (SAC) sites. Limited land management agreements and agri-environment schemes currently cover only small portions of the habitat. Actions to address forestry impacts, nitrogen pollution, and diffuse water pollution have been identified but remain largely unimplemented. Many large-scale hydrological impacts remain unaddressed.

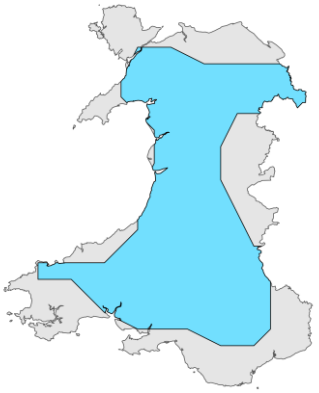
Despite restoration efforts on SACs/National Nature Reserves (NNRs), Active raised bogs remains highly vulnerable due to ongoing hydrological degradation, small patch size outside SACs, and nitrogen deposition. The habitat currently covers only 38.5% of its estimated original area in Wales, and small-scale losses remain untracked. Unless further measures are taken to reduce nitrogen inputs, much of the habitat may remain in unfavourable condition by 2035.

This first Wales-level assessment of Active raised bogs classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported a Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, compared to the previous UK-level evaluation which was Improving.

Credit: Pete Jones, NRW



Distribution map for H7110



Range map for H7110

H7110 Habitat area and short-term trends

Surface area (km^2): 15.89

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Increasing

H7110 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H7120 Degraded raised bogs

Degraded raised bogs encompass a range of habitats and land-cover types which have replaced active raised bog due to various land-use pressures, including drainage, agricultural reclamation, tree planting, and peat cutting. These areas include mire and heathland vegetation on peat, semi-improved and improved grassland, and both deciduous and coniferous woodland. To qualify as H7120, sites must be restorable to peat-forming condition within 30 years, allowing for broad inclusion due to restoration advances. Degraded raised bogs are strong emitters of carbon and other greenhouse gases, and their presence weakens the ecological resilience of adjacent active raised bogs. For further information on Degraded raised bogs, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7120/.

Degraded raised bogs are found mostly around the edges of lowland raised bogs, with sites such as Morfa Ystradowen and Waun Ddu almost entirely composed of this habitat. The total estimated area of the habitat in Wales is 897 ha, based on multiple survey datasets including the NRW Lowland Peatland Survey of Wales and the earlier Habitat Survey of Wales. There is no quantitative evidence for changes in surface area, but expert opinion suggests a probable decline due to degradation of unprotected peatlands.

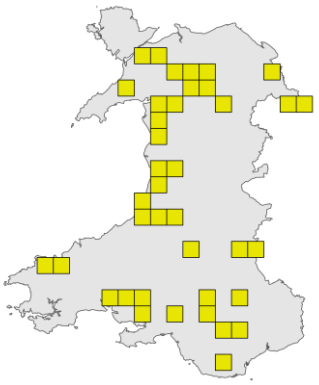
Major pressures on Degraded raised bogs include drainage, ongoing intensive agricultural management, extensive or intensive grazing, air pollution, and scrub encroachment due to under-management. Scrub invasion and *Molinia* dominance are also widespread issues, linked to past drainage, atmospheric nutrient deposition, and insufficient grazing. Additional pressures include historical peat extraction, afforestation, and nitrogen deposition exceeding critical loads across the habitat's extent.

Ongoing conservation actions include hydrological restoration, sustainable grazing practices, pollution control, and adapting forest management. However, implementation remains limited, with only 20.3 ha under NRW land management agreements and minimal restoration outside Special Areas of Conservation (SACs).

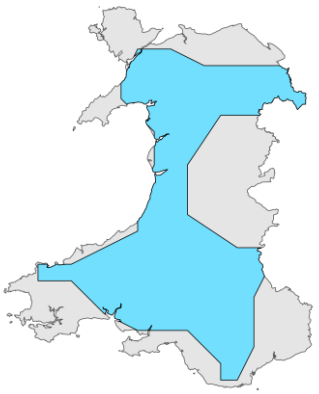
A strategic shift to large-scale ecosystem restoration could substantially increase restoration to active raised bog (H7110*) within 50 years. Future prospects are challenged by continued nitrogen deposition and ongoing intensive management which will make future restoration harder.

This first Wales-level assessment of Degraded raised bogs classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Improving.

Credit: Pete Jones, NRW



Distribution map for H7120



Range map for H7120

H7120 Habitat area and short-term trends

Surface area (km^2): 8.97

Area short-term trend: Decreasing

Range short-term trend: Decreasing

Structure and function short-term trend: Uncertain

H7120 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Unfavourable-inadequate (U1)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H7130 Blanket bogs

Blanket bog is widespread in upland Wales, occurring above 300 m on plateaux, ridges, and slopes, as well as at lower altitudes as smaller habitat expanses. It is shaped by rainfall, temperature, topography, and past land use, with significant areas affected by post war afforestation. The habitat features large, uninterrupted wet peatland areas with natural vegetation zonation linked to variations in peat depth, hydrology, and development. It includes good quality sub-montane bog vegetation types, though areas variously dominated by heathers, grass and sedge are common in degraded sites. For further information on Blanket bog, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7130/.

Blanket bog occurs across 115 hectads in Wales based on 2012 data. At least 68% of the habitat records are from 1996 or later. There is no system for monitoring gains or losses in blanket bog, though some localised losses and unquantified gains have occurred. Most restoration is within the habitat's core range, and expert judgement indicates a decreasing trend.

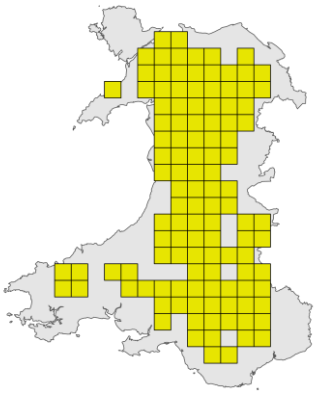
Key pressures include over- and under-grazing, drainage for agriculture and forestry, atmospheric nitrogen deposition and renewable energy development. The spread of *Molinia caerulea* and *Calluna vulgaris* is linked to historic and current management, especially grazing, burning and drainage. Windfarm development, afforestation, atmospheric deposition and conifer invasion remain threats. Climate-related pressures include temperature and precipitation changes, although specific impacts are difficult to isolate. Peat erosion and inappropriate burning also persist across the habitat.

Restoration efforts include grip blocking, other rewetting measures, and grazing management under schemes like Glastir Advanced. Cutting and grazing trials have shown positive results for *Molinia*-dominated bogs. Conifer removal and peatland restoration are priorities, along with measures to reduce nitrogen deposition and prevent loss and damage caused by renewable energy development. Management agreements and Special Area of Conservation/Site of Special Scientific Interest (SAC/SSSI) designations support ongoing conservation and the National Peatland Action Programme is focussing on afforested bog restoration and measures to address drainage and erosion.

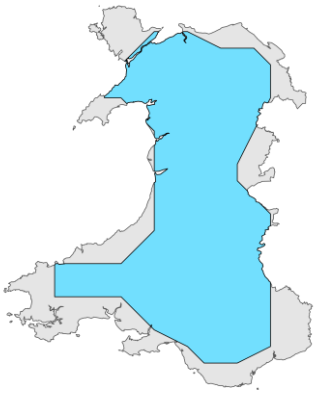
Future prospects for blanket bog are mixed. While some peatland area gains are expected from conifer removal and rewetting, others areas of afforestation (including re-stocking) remain on restorable peat and with the risk of further loss and damage from renewable energy development. Although restoration can return modified peatlands to a much better or even active status, atmospheric nitrogen deposition exceeds critical loads across all sites, posing a significant ongoing threat. Effective restoration requires safeguarding whole peat bodies and ecosystem-level interventions. Despite protected area coverage and restoration efforts, much of the habitat is projected to remain in unfavourable condition by 2035 due to nitrogen deposition.

This first Wales-level assessment of Blanket bogs classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Peter Jones, NRW



Distribution map for H7130



Range map for H7130

H7130 Habitat area and short-term trends

Surface area (km^2): 532

Area short-term trend: Decreasing

Range short-term trend: Decreasing

Structure and function short-term trend: Unknown

H7130 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Unfavourable-inadequate (U1)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H7140 Transition mires and quaking bogs

Transition mires and quaking bogs in Wales encompass a variety of poor-fen and bog-like mires influenced by weakly minerotrophic conditions. These habitats occur in topogenous and soligenous contexts and may occur in association with bog habitats, although the habitat is the primary peatland feature at many sites. They are frequently located on formerly cut-over peat surfaces, representing stages in peatland regeneration following historical peat extraction. This habitat constitutes a highly valuable but patchily distributed conservation resource in the Welsh Special Area of Conservation (SAC) network. For further information on Transition mires and quaking bogs, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7140/.

The 2013 distribution map remains in use, reflecting 103 hectad records and based on a GIS analysis of 12,259 polygon records, mostly from NRWs Lowland Peatland Survey of Wales. The total extent is estimated at 336.11 ha, though this is a minimum figure due to data gaps and unassessed sites. No new survey data were incorporated for the 2025 reporting round, and range trends are considered unknown due to a lack of comprehensive surveillance. Condition monitoring has been limited since 2012, with assessments often relying on older or subjective data.

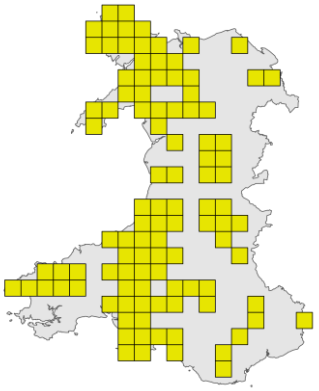
Key pressures include undergrazing and abandonment of traditional land management, leading to scrub encroachment. Air pollution, notably nitrogen deposition, affects nearly all habitat areas, and drainage for agriculture remains a major ongoing issue. Water pollution from both diffuse and point sources also contributes to habitat degradation. Invasive alien species and altered precipitation patterns from climate change are additional concerns. These pressures are expected to persist due to insufficient resources, the extent of habitat outside the protected site series, and limited agri-environment support.

Planned and implemented measures address grazing, pollution, invasive species, and hydrological restoration, though most actions remain incomplete. An EU LIFE project now targets four core SACs for habitat restoration through improved hydrology, nutrient control, and sustainable grazing. Agri-environment schemes cover limited habitat area, and there is scope for more management agreements. Monitoring and notification of high-quality sites outside statutory protection are essential to enhance habitat coverage and condition.

While significant range change is not anticipated, slight habitat area decline is likely due to scrub invasion and nutrient-driven succession. Structural and functional condition is expected to remain poor or unknown across much of the resource, exacerbated by low agri-environment uptake and persistent high nitrogen deposition. The habitat's resilience may buffer some impacts, but without broader implementation of targeted management, conditions are unlikely to improve substantially. Sustained intervention across statutory and non-statutory sites is crucial for maintaining the conservation value of this habitat.

This first Wales-level assessment of Transition mires and quaking bogs classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Pete Jones, NRW



Distribution map for H7140

Range map for H7140

H7140 Habitat area and short-term trends

Surface area (km^2): 3.38

Area short-term trend: Decreasing

Range short-term trend: Unknown

Structure and function short-term trend: Decreasing

H7140 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Unknown (XX)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H7150 Depressions on peat substrates

This habitat is characterised by open, low-growing oligotrophic vegetation, including poor-fen or bog species such as Sphagna, *Rhynchospora* spp., *Drosera* sp., and rarer plants like *Lycopodiella inundata* and *Pinguicula lusitanica*. It typically appears in small patches within larger complexes, including wet heath, blanket and lowland raised bog, and poor fens. Its identification depends on the presence of certain indicator species (e.g., *Rhynchospora alba*, *Lycopodiella inundata*, and *Pinguicula lusitanica*) within specified National Vegetation Classification (NVC) communities. This habitat occurs on acidic peats, in both upland and lowland contexts. For further information on Depressions on peat substrates, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7150/.

There are 21 hectad records for this habitat based on the 2013 assessment, though this likely underrepresents its actual distribution in Wales. The mapped GIS inventory contains 399 polygon records, primarily from surveys since 2004, with 96.5% from NRW's Lowland Peatland Survey of Wales and Preseli Survey programmes. The estimated extent is 0.175 km², but this is considered a minimum due to excluded data from known sites. Changes in range during the reporting period are considered unlikely.

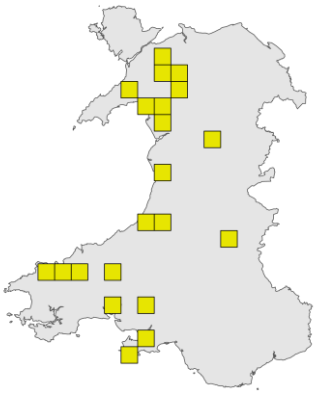
Major ongoing pressures include drainage for agriculture and altered water levels, insufficient and inappropriate grazing, and atmospheric nitrogen deposition. Other pressures are invasion by alien and problematic native species, access-related disturbance, and air pollution. Sea-level rise and changing precipitation regimes due to climate change are also listed as future threats, with expected continued air pollution and rising visitor pressure in upland sites.

Conservation actions include promoting appropriate grazing, managing or reversing drainage, and restoring hydrology, particularly through the New LIFE for Welsh Raised Bogs project. Efforts also target air pollution reduction, monitoring nitrogen deposition impacts, and controlling invasive species like Rhododendron. A portion of the habitat is designated in Special Areas of Conservation (SACs) and National Nature Reserves (NNRs), but many identified actions remain incomplete. Measures also address localised pollution and erosion control through management and restoration activities. There is much scope for expanding the area of this habitat across lowland and upland bogs through extensive hydrological interventions supported through the National Peatland Action Programme.

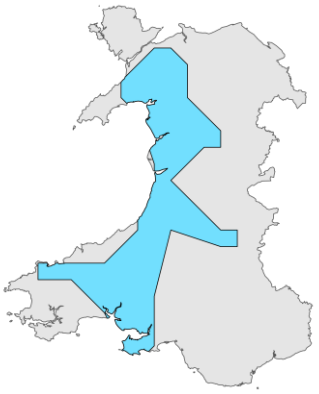
No major range changes are expected, though new records may modestly expand known distribution. Area trends are uncertain; contraction is possible where restoration is lacking, but expansion may occur on restored bog sites. Structure and function prospects remain poor due to limited condition data, modest inclusion in management schemes, and significant nitrogen deposition impacts. Without further intervention, at least 25% of the habitat is likely to remain in poor condition by 2035 due to atmospheric nitrogen deposition.

This first Wales-level assessment of Depressions on peat substrates classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: Peter Jones, NRW



Distribution map for H7150



Range map for H7150

H7150 Habitat area and short-term trends

Surface area (km²): 0.175

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H7150 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Favourable (FV)

Structure and function status: Unfavourable-inadequate (U1)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H7210 Calcareous fens

Calcareous fen vegetation of the priority Annex I habitat H7210 includes the tall sedge *Cladium mariscus* and occurs mainly in topogenous or rheo-topogenous situations influenced by generally base-enriched groundwater. The habitat incorporates the National Vegetation Classification (NVC) type M9 and M13 communities with a *Cladium* overstorey, reed-fen types S24 and S25, as well as dense *Cladium* stands like the S2 sedge swamp and non-NVC *Cladio-Molinietum*. The *Cladio-Molinietum* features *Cladium* with species such as *Molinia caerulea*, *Myrica gale,* and *Juncus subnodulosus*, plus calciphiles like *Carex hostiana* and *Schoenus nigricans.* Management through grazing promotes more open, species-rich *Cladium* vegetation. For further information on Calcareous fens, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7210/.

The habitat is concentrated in Wales on Anglesey and the Llyn Peninsula, with additional but atypical examples at Cors Crymlyn and Pant y Sais fens in south Wales. A total of 76.1 ha of Calcareous fen was estimated within Special Areas of Conservation (SACs), including 33.6 ha at Cors Crymlyn, and 5.1 ha and 37.4 ha in the Corsydd Llyn and Corsydd Mon SACs respectively. The Cors Llyferin site in SH32 has likely been lost, and the SS78 record is invalid. Post-LIFE deterioration since 2013 is reported in the Anglesey and Llyn areas due to insufficient management.

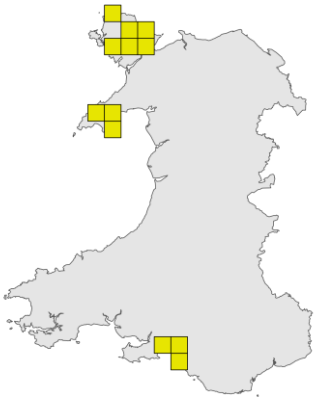
This habitat is affected by abandonment of traditional practices such as grazing, mowing, and burning. Many sites remain adversely affected by drainage, primarily for agriculture. Intensive agriculture within the site catchments contributes to nutrient enrichment, and habitat loss. Airborne nitrogen pollution is a significant current issues and invasive species like Himalayan Balsam (*Impatiens glandulifera*) are an emerging concern. Potential impacts from quarrying and climate-induced drought also pose threats.

Restoration through mowing, grazing, and burning was undertaken during the Anglesey & Llyn Fens LIFE project. However, lack of a formal after-LIFE phase has limited continuation. Efforts to reduce diffuse nutrient pollution through agri-environment schemes and constructed wetlands have had limited effectiveness. Hydrological interventions were implemented, but more action is needed. In addition to addressing drainage and under-management, measures addressing air pollution, climate resilience, and early eradication of invasive species have been identified as current priorities.

The area of the habitat is projected to decline due to continued management neglect and nutrient enrichment. Still, where restoration has been completed, appropriate grazing appears capable of maintaining condition. Future sustainability depends on securing long-term hydrological and nutrient controls and engaging owners of non-statutory sites supporting this habitat.

This first Wales-level assessment of Calcareous fens classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Improving.

Credit: Peter Jones, NRW



Distribution map for H7210

Range map for H7210

H7210 Habitat area and short-term trends

Surface area (km^2): 0.628

Area short-term trend: Decreasing

Range short-term trend: Decreasing

Structure and function short-term trend: Decreasing

H7210 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Unfavourable-inadequate (U1)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H7220 Petrifying springs with tufa

Petrifying springs with tufa are small hard water springs associated with tufa and typically dominated by bryophytes such as *Palustriella commutata*. In Wales, these habitats occur across upland and lowland grasslands, fens, woodlands, and coastal cliffs, with strong but not exclusive association to carbonate-rich geological formations. The habitat supports a variety of bryophytes, some of which have declined in lowland Britain, and can also host rare invertebrates. For further information on Petrifying springs with tufa see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7220/.

The habitat has been recorded in 38 ten-kilometre squares based on 1996–2012 data from multiple National Vegetation Classification (NVC) surveys, although more focussed survey is required. The recorded extent as of 2012 includes 5.61 ha from upland surveys, 0.044 ha from lowland surveys, and 0.0055 ha from point records. No records pre-date 1990, and no post-2012 records were included. There is no quantitative evidence for short- or long-term trends in range or area, but expert opinion indicates a decline.

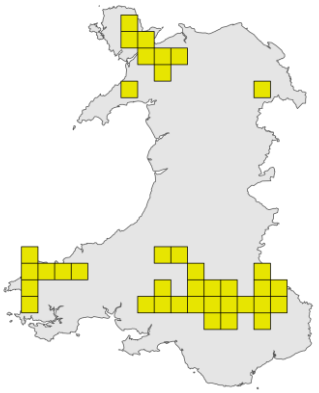
Key pressures include intensive and insufficient grazing, abandonment of traditional land management, natural succession, agricultural pollution, drainage, abstraction, and nitrogen deposition. Overgrazing and undergrazing are cited as current issues, particularly for upland areas. Agricultural nutrient enrichment has been confirmed at least at one site. Air pollution from nitrogen deposition affects 100% of habitat area and is expected to continue. Climate-related changes in precipitation and hydrological pressures may also impact some sites.

Several conservation measures are in place, including adapting and reinstating grazing, controlling natural succession, and addressing pollution from agriculture. Measures cover both direct site management and broader regulatory efforts. Targeted grazing management is needed due to the habitat's often limited extent in large management units. As of 2018, only small portions of the habitat were covered under Glastir schemes. Monitoring and pollution reduction measures are either limited or not widely implemented outside protected sites.

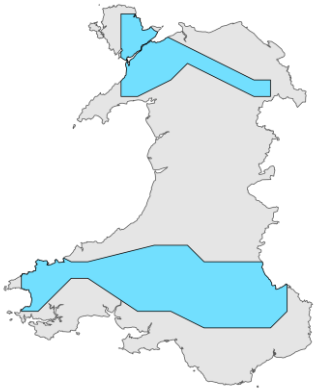
Future prospects are mixed. The habitat's small and localised nature makes site-level management feasible but also increases vulnerability to loss. Much of the habitat area may be in unfavourable condition by 2035 due to nitrogen deposition unless further measures are taken. Lowland stands may be particularly contracting in extent, and insufficient survey data impairs confident area assessments. However, the feasibility of complete surveys and management targeting improves outlook if action is taken.

This first Wales-level assessment of Petrifying springs with tufa classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Deteriorating.

Credit: Pete Jones, NRW



Distribution map for H7220



Range map for H7220

H7220 Habitat area and short-term trends

Surface area (km^2): 0.0566

Area short-term trend: Unknown

Range short-term trend: Unknown

Structure and function short-term trend: Unknown

H7220 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Unknown (XX)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H7230 Alkaline fens

Alkaline fens comprise species-rich mire vegetation influenced by calcareous groundwater and/or runoff. Many examples occur in soligenous contexts, with others in topogenous basins or valley-heads where lateral water movement continues through or over peat layers. Three core National Vegetation Classification (NVC) communities define this habitat in Wales: M9, M10, and M13. Alkaline fen vegetation includes short sedges, low-growing dicots, and a diverse range of brown mosses. For further information on Alkaline fens, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7230/.

The habitat extended over 138.7 ha in Wales when last assessed in 2018. A total of 120 hectads have been recorded, though coverage is not comprehensive; many of these records are likely to relate to the M10 community, with M9 and especially M13 much more localised. The short-term trend shows a decreasing direction, reflecting loss of sites on Llyn and from at least two Anglesey sites since 2007. This suggests the decrease rate may now exceed 1%.

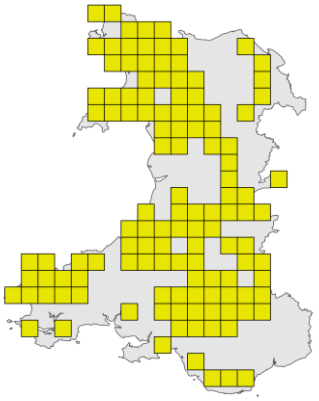
Key pressures include abandonment of traditional management, undergrazing or extensive grazing, and agricultural pollution. Other significant pressures are drainage, other aspects of modified hydrology, water abstraction and atmospheric nitrogen deposition. Under-grazing leads to species overdominance. Agricultural conversion, and invasive species also affect the habitat. Additional concerns include resource extraction, altered precipitation patterns due to climate change, and potential energy developments.

Management actions include reinstating grazing, mowing and burning on sites where these have lapsed, including on sites included within the former Anglesey & Llyn Fens LIFE project. Hydrological restoration and water abstraction management remain as critical priorities. Pollution prevention and mitigation efforts include nutrient interception through constructed wetlands: a more strategic and active approach to nutrient action planning is, however, a priority for core Special Areas of Conservation (SACs). Urgent measures are needed to target climate change adaptation and early action against invasive species.

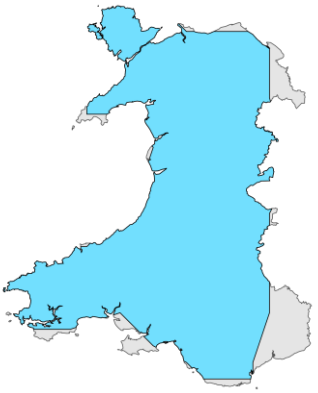
Future range trends include expected area loss due to management neglect and agricultural intensification. Structure and function face risks from poor habitat condition, limited agri-environment uptake, and atmospheric nitrogen impacts.

This first Wales-level assessment of Alkaline fens classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Deteriorating, compared to the previous UK-level evaluation which was Stable.

Credit: Peter Jones, NRW



Distribution map for H7230



Range map for H7230

H7230 Habitat area and short-term trends

Surface area (km^2): 1.387

Area short-term trend: Decreasing

Range short-term trend: Decreasing

Structure and function short-term trend: Decreasing

H7230 Favourable conservation status and trend

Area status: Unfavourable-bad (U2)

Range status: Unfavourable-inadequate (U1)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Deteriorating

For full supporting evidence, see the searchable table of detailed reports.

H7240 Alpine pioneer formations

Alpine pioneer formations occur at high altitudes in Wales, forming a type of flush mire. These communities colonise open substrates that are continuously flushed by cold, base-rich water. They include small sedges, rushes, herbs, bryophytes, and many arctic-alpine species. In Wales, all recorded examples belong to the National Vegetation Classification (NVC) M11a *Carex demissa – Saxifraga aizoides* community, notably characterised by *Blindia acuta,* with *Juncus triglumis* being a diagnostic, though not universal, species. For further information on Alpine pioneer formations, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H7240/.

All digitised records for this habitat in Wales originate from surveys conducted between 1996 and 2005, with confirmed presence in both known hectads as recently as 2012 and 2016. No further survey data have been obtained since the 2013–2018 reporting round. The estimated surface area of this habitat is 3 ha based on expert opinion, although only 0.99 ha has been mapped, likely due to the habitat's small patch size and mapping limitations given the inaccessible character of some locations. A previous stable trend assessment has been revised to unknown due to lack of recent data.

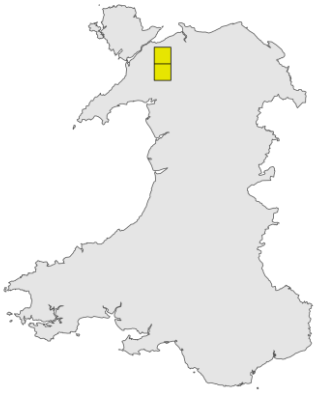
The main pressures on this habitat include intensive grazing by livestock, air pollution from nitrogen deposition, and recreational disturbance from tourism. The spread of the non-native plant *Epilobium brunnescens* also presents an ongoing threat. Climate change-related pressures, including temperature and precipitation changes, may already be impacting the habitat and are expected to persist. Grazing intensity and type are of concern, though insufficient grazing has also been noted as an issue in some units.

Management focuses on eliminating or reducing sheep grazing, considered a damaging influence. Measures also aim to regulate and reduce air pollution from various sources, including industrial and recreational activities. Despite these efforts, no specific protections are currently in place to prevent trampling and erosion from nearby footpaths.

The habitat's geographic range is unlikely to change significantly within the next two reporting cycles, though this is uncertain. In the long term, climate change and excess nitrogen deposition are expected to negatively affect habitat structure and function. Without new mitigation measures, much of the habitat is projected to be in unfavourable condition by 2035 due to continued nutrient input.

This first Wales-level assessment of Alpine pioneer formations classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Improving.

Credit: Peter Jones, NRW



Distribution map for H7240

Range map for H7240

H7240 Habitat area and short-term trends

Surface area (km^2): 0.03

Area short-term trend: Unknown

Range short-term trend: Unknown

Structure and function short-term trend: Uncertain

H7240 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Unknown (XX)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

6.8 Woodland habitats

Image credit: David Reed, NRW

H9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) (‘Atlantic acidophilous beech forests’)

H9130 *Asperulo-Fagetum* beech forests

H9180 *Tilio-Acerion* forests of slopes, screes and ravines (‘*Tilio-Acerion* forests’)

H91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (‘Old sessile oak woods’)

H91D0 Bog woodland

H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) (‘Alluvial forests with alder and ash’)

H91J0 *Taxus baccata* woods of the British Isles (‘Yew-dominated woodland’)

H9120 Atlantic acidophilous beech forests

Atlantic acidophilous beech forests occur on acidic to neutral soils under relatively cool and high rainfall climatic conditions and are the beech woodland equivalent of H91A0 'Old sessile oakwoods'. Beech (*Fagus sylvatica*) is only accepted as native in the south-east corner of Wales, where it reaches not just its UK but its European edge-of-range, giving an exotic and continental flavour to this part of Wales. Beech casts a very dense shade and produces dense, persistent leaf litter which have strong ecological influences: the ground flora and shrub layers can be relatively low diversity and less well developed than other woodland types, but they include a range of rare and distinctive species. They are represented by National Vegetation Classification (NVC) types W15 and part of W14. For further information on Atlantic acidophilous beech forests, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H9120/.

Ecologically, British beechwoods form a continuum with those on the continent and the Welsh examples are important as they define the north-western limit of this species and provide oceanic variants of this type. Atlantic acidophilous beech forests are restricted to the extreme south-east of Wales where beech is considered native and occur on acidic soils. It includes the former administrative counties of Gwent and the eastern halves of Mid and south Glamorgan. Floristically similar stands occur elsewhere in Wales where beech has been planted but are not included in the current analysis. The total area of this habitat is estimated at approximately 2,100 ha, with a suggested range of 1,500–2,500 ha. The habitat's distribution and area figures are based on data collected up to 2012 and have not been re-assessed since.

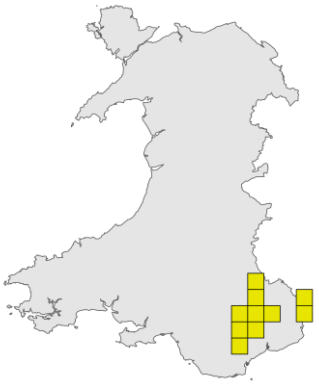
Major pressures include air pollution, climate-related changes, invasive species, forest management issues, and recreational impacts. Future threats include over- or under-grazing, deer browsing, pathogens, and potential habitat shifts due to climate change.

Conservation efforts focus on maintaining and restoring the habitat's structure and functions, both site-specifically and at landscape scale. Actions include management of pollution, invasive and problematic species, forest practices, recreation, and grazing regimes. There are also measures to prepare for and adapt to climate change and to control plant and animal diseases.

Climate change is likely to expand the climatic envelope for the habitat north and westward, allowing range and area increases on suitable soils. Future area trends are expected to be positive due to woodland expansion and restoration of ancient woodlands supported by policy. However, much of the habitat may remain in unfavourable condition by 2035 due to nitrogen deposition unless further action is taken.

This first Wales-level assessment of Atlantic acidophilous beech forests classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: James Latham, NRW



Distribution map for H9120

Range map for H9120

H9120 Habitat area and short-term trends

Surface area (km^2): 21

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H9120 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H9130 *Asperulo-Fagetum* beech forests

The *Asperulo-fagetum* beech forest occurs on base-rich soils and is represented by National Vegetation Classification (NVC) types W12 and part of W14. Beech (*Fagus sylvatica*) is accepted as native only in the south-east corner of Wales, where it reaches its UK and European edge-of-range. Beech casts dense shade and produces persistent leaf litter, which can result in relatively low diversity in the ground flora and shrub layers. Nevertheless, it supports a range of rare and distinctive species. For further information on *Asperulo-Fagetum* beech forests, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H9130/.

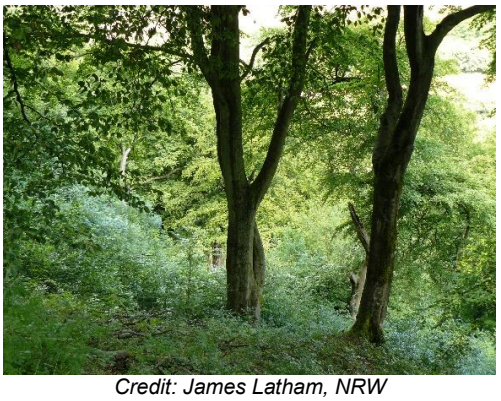
Ecologically, Welsh beechwoods form a continuum with those on continental Europe and are important as they define the north-western limit of this species and provide oceanic variants of the type. *Asperulo-Fagetum* beech forests are limited in range to the extreme south-east of Wales, and include the former administrative counties of Gwent and the eastern halves of Mid and South Glamorgan. The estimated area of the habitat in Wales is 1,300 ha, with a suggested range of 1,000–1,500 ha. There is no evidence available to judge short-term trends in total habitat area. The distribution reported in previous assessments remains unchanged.

Main high-level pressures on this habitat include deer browsing, rock extraction, and air pollution. Deer browsing, especially by fallow deer, affects regeneration and composition, notably on Special Area of Conservation (SAC) sites. Quarrying threatens the habitat through direct loss and associated effects like dust and hydrological changes. Airborne nitrogen deposition exceeds critical loads across the habitat, though specific impacts are unquantified. Medium-level pressures include climate-related changes, invasive species, changes in forest management, and recreation.

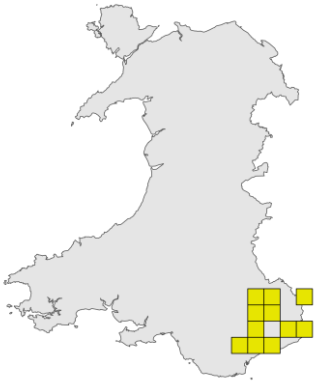
Conservation measures include mitigating quarry impacts through planning, managing deer populations, and addressing air pollution via national regulation. Other actions aim to increase habitat resilience and connectivity to support adaptation to climate change. Invasive species management requires ongoing vigilance and planning. Forest management measures vary to maintain structural diversity, including interventions and non-intervention approaches. Recreational impacts are mitigated through visitor management and awareness.

Future prospects for range and area are cautiously positive, with climate change potentially enabling northward and westward expansion. This may be facilitated by policy support and suitable site availability, although base-rich soils are less common beyond the current range. Habitat area may increase through woodland cover expansion and restoration of ancient woodland sites, possibly aided by ash decline. However, structure and function trends are uncertain due to contrasting influences, and much of the habitat is expected to remain in unfavourable condition due to nitrogen deposition.

This first Wales-level assessment of *Asperulo-Fagetum* beech forests classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.



Credit: James Latham, NRW



Distribution map for H9130

Range map for H9130

H9130 Habitat area and short-term trends

Surface area (km^2): 13

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H9130 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H9180 *Tilio-Acerion* forests

Tilio-Acerion forests generally occur on calcareous substrates such as coarse scree, cliffs, steep rocky slopes, and ravines but also along streams within other types of woodland in gorges and steep valleys. In Wales, ash (*Fraxinus excelsior*) is usually the dominant tree species, although sycamore (*Acer pseudoplatanus*) is also commonly present. These woodlands are structurally diverse due to their unstable slopes and support a rich diversity of flowering plants, ferns, and lower plants. For further information on *Tilio-Acerion* forests, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H9180/.

A cautious estimate suggests that the total area of *Tilio-Acerion* in Wales is approximately 3,000 ha, with a range between 2,800 and 3,500 ha. This estimate is based on GIS analysis considering slope, substrate, and vegetation data from 1985 to 2012. This is roughly 25% of the UK resource, occurring throughout Wales and making up c.20% of all native woodland in Wales. The largest concentrations are in Conwy, Denbighshire, Flintshire, Monmouthshire, central Carmarthenshire and south-east and west Glamorgan. There is no evidence available to determine short-term trends in the habitat's total area.

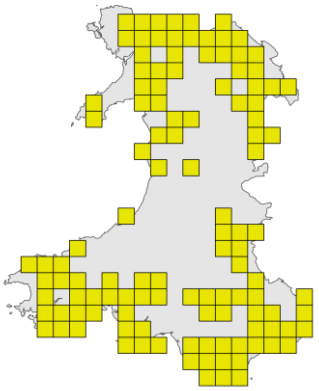
Key pressures include Chalara ash dieback, present in all 10-km squares where the habitat occurs, posing a severe threat due to ash being a critical component of the habitat. Additional pressures include invasive non-native species, such as cherry laurel (*Prunus laurocerasus*), beech (*Fagus sylvatica*), and Himalayan balsam (*Impatiens glandulifera*), and browsing by deer, which affect habitat composition and regeneration. Other significant pressures are nitrogen deposition, climate-related habitat fragmentation, abandonment of traditional management, inappropriate forestry practices, recreation, and quarrying. Future threats include potential introduction of the emerald ash borer (*Agrilus planipennis*), increasing deer populations, habitat fragmentation due to low connectivity, and potential impact from infrastructure developments.

Conservation efforts include strategies to manage Chalara ash dieback and deer populations, control invasive species, and adapt forest management practices. These include maintaining and reinstating traditional management, stopping harmful practices, and adapting existing ones for habitat benefit. Climate change adaptation strategies focus on building ecological connectivity through large-scale networks. Efforts also aim to reduce impacts from air pollution and recreation.

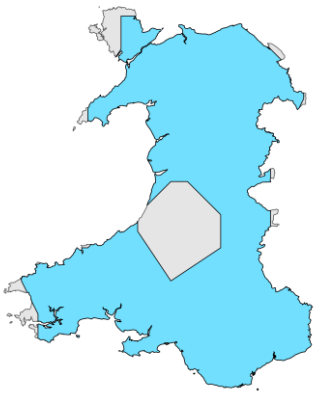
The future of *Tilio-Acerion* in Wales is uncertain due to the widespread impact of Chalara ash dieback. Although some ash trees may be resistant, and ground flora persists, the structural integrity and species composition of the habitat are likely to be severely affected. Additional pressures, including increasing deer populations and persistent air pollution, further diminish its prospects. While general woodland cover may increase, opportunities for expanding *Tilio-Acerion* are limited by geological and topographical constraints and the embargo on ash planting. Restoration of ancient woodland sites may offer limited potential for area gains and improved habitat connectivity. Without further measures to reduce nitrogen deposition, much of the habitat is expected to be in unfavourable condition in 2035 due to nutrient overload.

This first Wales-level assessment of *Tilio-Acerion* forests classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Stable, consistent with the previous UK-level evaluation.

Credit: James Latham, NRW



Distribution map for H9180



Range map for H9180

H9180 Habitat area and short-term trends

Surface area (km^2): 30

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Stable

H9180 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Stable

For full supporting evidence, see the searchable table of detailed reports.

H91A0 Old sessile oak woods

Old sessile oak woods occur in relatively cool, high rainfall areas on acidic soils, with canopy trees mainly of sessile oak (*Quercus petraea*) and birch (*Betula* spp.), and an understorey typically of rowan (*Sorbus aucuparia*), holly (*Ilex aquifolium*), and hazel (*Corylus avellana*). The habitat corresponds to a range of National Vegetation Classification (NVC) communities, including W10e, W11, W16b, and W17. Flowering plant diversity is relatively low, but the habitat is nationally and internationally notable for its richness in mosses, liverworts, and ferns. Wales has an estimated 48,000 ha, some 40% of the UK/global resource. This estimate is based on stratified analysis using woodland data and environmental zones. Globally, habitats equivalent to upland oakwoods are almost entirely restricted to the British Isles and Ireland, elevating the importance of Wales's role in its conservation. For further information on Old sessile oak woods, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H91A0/.

Old sessile oak woods are widespread across Wales. The greatest abundance and diversity are found towards the west. Most occur in a zone that covers most of Snowdonia, extending south through the borders of Powys and Ceredigion to northern Carmarthenshire. There is also high representation in north-west Glamorgan. The habitat is least common along the southern and northern seaboards. There is no evidence of significant change in distribution since 2012. No data are available to judge short-term trends due to wide variability in the data base and confidence intervals.

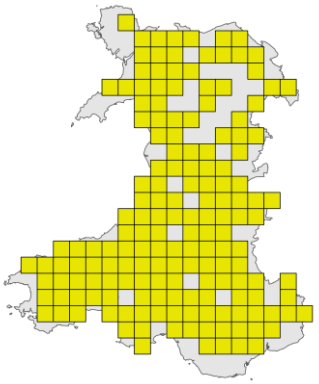
Major pressures include both overgrazing and undergrazing, which hinder either tree regeneration or support for lower plants. Air pollution from nitrogen deposition affects the habitat universally, with bryophytes and lichens being especially sensitive. Invasive non-native species, particularly *Rhododendron ponticum* and various conifers, are widespread threats. Additional pressures include hydropower developments, changes in forest management practices, and climate-related impacts on habitat connectivity.

Key measures include adapting grazing regimes to support both tree regeneration and lower plant diversity. Efforts are underway to manage and eradicate invasive species such as Rhododendron and non-native conifers. Other actions involve mitigating the impacts of hydropower and restoring traditional forest management practices. There is also a focus on enhancing ecological networks for climate resilience and controlling plant pathogens like *Phytophthora* spp.

The total area of the habitat is expected to increase due to Welsh Government policies on woodland planting and restoration of plantations on ancient woodland sites (PAWS). However, habitat condition may continue to decline due to challenges in achieving appropriate grazing regimes and ongoing nitrogen pollution. Plant pathogens and climate change pose additional risks, especially to sensitive lower plant species. Projects like the Celtic Rainforest LIFE are contributing to habitat restoration and improved management.

This first Wales-level assessment of Old sessile oak woods classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: David Reed, NRW



Distribution map for H91A0

Range map for H91A0

H91A0 Habitat area and short-term trends

Surface area (km^2): 480

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H91A0 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H91D0 Bog woodland

Bog woodland in Wales occurs in a fragmentary and poorly quantified pattern. It strictly includes woodland found on ombrogenous active bogs with minimal canopy cover and without adverse effects on bog species present. This habitat is typically associated with WETMEC (Wetland Water Supply Mechanism) 1 and WETMEC 2 peat types, but its potential occurrence on WETMEC 3 remains uncertain. In Wales, associations are strongest with the rare National Vegetation Classification (NVC) W4c community and, to a lesser extent, W2b and W3, though the latter two are less confidently identified as bog woodland types in Wales. For further information on Bog woodland, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H91D0/.

The most recent comprehensive analysis of range and extent was completed in 2012 using vegetation legacy surveys. No new data has significantly altered this assessment. Distribution remains limited and widespread across north and mid Wales, with some presence in southeast Wales and absence in the southwest. A cautious estimate based on expert judgment suggests a total area of approximately 150 hectares, within a possible range of 100–200 hectares. No reassessment has occurred, and no conclusions can be made on recent trends.

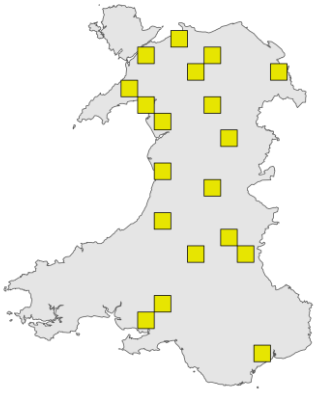
Major pressures include air pollution, particularly nitrogen deposition, which exceeds critical load levels across all sites and impacts bryophyte-rich communities. Invasive species such as *Rhododendron ponticum* pose serious threats. Water table disruption due to drainage is also significant. Climate-related changes, both in precipitation and in ecological connectivity, may further challenge habitat resilience. Grazing imbalances and pollution of water sources contribute to ongoing pressures.

Conservation actions have aimed at hydrological restoration and maintaining structural integrity. Key measures include raising water tables, controlling invasive species, restoring forest habitat on deep peat, and enhancing climate resilience through ecological networks. National Peatland Action Programme (NPAP) and Raised Bog LIFE projects have contributed, with additional plans focusing on deer management, pathogen vigilance, and adaptive grazing regimes.

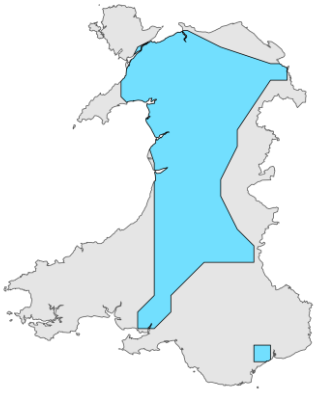
Future prospects for the habitat are constrained by ecological uncertainties and limited establishment potential due to competition with other habitat restoration. While overall woodland cover in Wales may increase, this is unlikely to benefit bog woodland directly due to peatland planting restrictions. Restoration from former conifer sites provides limited opportunities. Without further action to reduce nitrogen deposition, much of the habitat is expected to be in unfavourable condition by 2035.

This first Wales-level assessment of Bog woodland classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) reported an Unfavourable-inadequate status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Improving.

Credit: Dan Abrahams, Natural England 2025



Distribution map for H91D0



Range map for H91D0

H91D0 Habitat area and short-term trends

Surface area (km^2): 1.5

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H91D0 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H91E0 Alluvial forests with alder and ash

Alluvial forests with alder (*Alnus glutinosa*) and ash (*Fraxinus excelsior*) in Wales are widespread but highly fragmented. They occur on river alluvium and floodplains, including a range of woodland types. There is a strong compositional bias towards wet woodland, as most free-draining floodplain soils have been converted to other uses. These forests can be structurally complex and diverse but their potential is limited by fragmentation and this wet woodland bias. For further information on Alluvial forests with alder and ash, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H91E0/.

The distribution of alluvial woodland was last comprehensively analysed in 2012, and no new data has significantly changed this assessment. There is insufficient evidence to determine recent trends in the overall extent of this habitat in Wales. The habitat remains reported from the same 10 km squares as before, and its highly fragmented nature has persisted. Estimates are based on GIS analysis, incorporating woodland cover, topography, and flooding potential, with some expert judgment used.

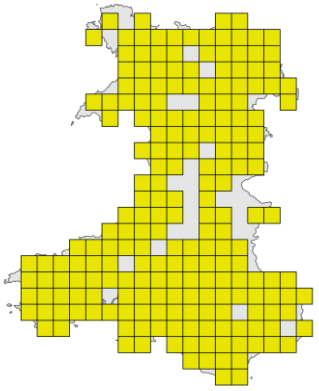
Key pressures on alluvial woodland include water abstraction, agricultural conversion, and development that disrupt natural hydrological processes. Other threats stem from invasive non-native species, particularly those spread via water, such as Himalayan balsam (*Impatiens glandulifera*) and Japanese knotweed (*Fallopia japonica*). Air and water pollution, particularly from agriculture, contribute additional pressures, while disease affects major canopy species such as alder and ash. Future threats include climate change impacts, deer browsing, and limited opportunities for habitat expansion due to competition with other land uses.

Conservation measures focus on maintaining and restoring structure and function, including hydrological reconnection of floodplains and restoration of habitat. Efforts are underway to manage invasive species and plant pathogens, and to implement climate adaptation strategies to improve landscape connectivity. Pollution reduction and appropriate forest management practices are also being promoted to support biodiversity. Nature-based solutions, such as floodplain woodland expansion for ecosystem services, are increasingly supported by policy initiatives.

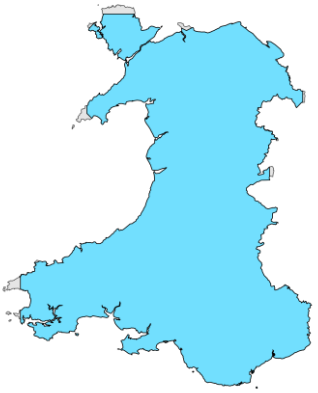
While alluvial woodland is widely distributed, their area is small and extremely fragmented, with limited scope for restoring full natural processes. Ongoing small-scale habitat loss is expected, but new areas may be created for biodiversity and flood mitigation, supported by policy and planting schemes. Structural and functional prospects are uncertain due to contrasting pressures and benefits, but a significant proportion may remain in unfavourable condition due to nitrogen deposition. Positive drivers include ecosystem service recognition and potential beaver reintroduction, though risks from invasive species and pollution remain.

This first Wales-level assessment of Alluvial forests with alder and ash classifies their overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: David Reed, NRW



Distribution map for H91E0



Range map for H91E0

H91E0 Habitat area and short-term trends

Surface area (km^2): 30

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Uncertain

H91E0 Favourable conservation status and trend

Area status: Unfavourable-inadequate (U1)

Range status: Favourable (FV)

Structure and function status: Unknown (XX)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.

H91J0 Yew-dominated woodland

Yew-dominated woodland is a scarce habitat in Wales, found only in a few locations typically over limestone. It corresponds to W13 in the National Vegetation Classification and is characterised by a canopy dominated almost exclusively by yew (*Taxus baccata*). The dense shade cast by yew results in a species-poor ground flora and limited shrub layer. The habitat's ecology, including its regeneration and interactions with other habitats, is poorly understood. For further information on Yew-dominated woodland, see the JNCC habitat account https://sac.jncc.gov.uk/habitat/H91J0/.

An analysis in 2012 estimated the total area of Yew-dominated woodland in Wales at 29.2 hectares, with a cautious estimate of 50 hectares and an upper limit of 100 hectares. The distribution has not changed since 2012 and remains limited to a few localities. No updated analysis has been undertaken for short-term trends, and the trend direction is considered unknown. It is unlikely that many large stands have been missed, although small patches may have gone unrecorded.

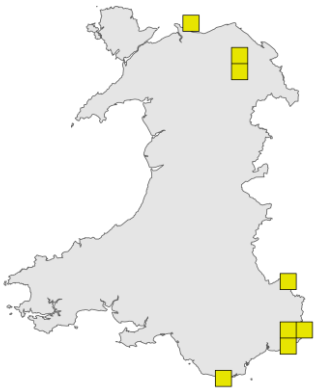
The main pressures include recreational activities such as trampling and fire, deer browsing, and air pollution from nitrogen deposition. Other pressures of medium concern involve invasive non-native species, changes in abiotic conditions due to climate change, and shifts in precipitation patterns. These same factors remain as future threats, with additional concerns about the spread of tree pathogens and expanding deer populations. Climate-related drought and fragmentation of habitat connectivity may further exacerbate these threats.

Current conservation efforts focus on maintaining and restoring habitat structure and function through Forest Design and habitat management plans. Measures include regulating recreational use, managing deer populations to encourage natural regeneration, and controlling invasive alien species including non-native conifers. Climate adaptation strategies aim to enhance ecological connectivity and resilience across landscapes. Air pollution is acknowledged as a significant impact, though local mitigation actions remain unclear.

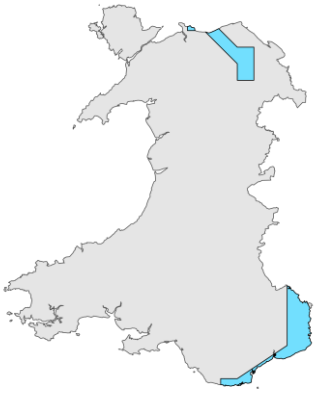
The future prospects of Yew-dominated woodland in Wales are uncertain due to limited understanding of its ecology and specific site requirements. Policy-driven woodland expansion is unlikely to significantly benefit this habitat, although small local gains may occur through restoration of ancient woodlands. The habitat may expand naturally in areas shared with beech forests or where ash dieback allows yew to become dominant. Nonetheless, pressures from recreation, deer, invasive species, nitrogen deposition, and climate change suggest a likely negative trend in condition.

This first Wales-level assessment of Yew-dominated woodland classifies its overall conservation status as Unfavourable-bad. Although not directly comparable, the previous UK-wide assessment (2019) also reported an Unfavourable-bad status. The overall habitat trend in Wales is assessed as Unknown, compared to the previous UK-level evaluation which was Stable.

Credit: James Latham, NRW



Distribution map for H91J0



Range map for H91J0

H91J0 Habitat area and short-term trends

Surface area (km^2): 0.5

Area short-term trend: Unknown

Range short-term trend: Stable

Structure and function short-term trend: Unknown

H91J0 Favourable conservation status and trend

Area status: Unknown (XX)

Range status: Favourable (FV)

Structure and function status: Unfavourable-bad (U2)

Future prospects status: Unfavourable-bad (U2)

Overall status: Unfavourable-bad (U2)

Overall trend: Unknown

For full supporting evidence, see the searchable table of detailed reports.