# Wildlife Sites Guidance Wales

## A Guide to Develop Local Wildlife Systems in Wales

PARTNERIAETH BIOAMRYWIAETH CYMRU
WALES BIODIVERSITY PARTNERSHIP

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## Foreword

The Welsh Assembly Government's Environment Strategy for Wales, published in May 2006, pays tribute to the intrinsic value of biodiversity – 'the variety of life on earth'. The Strategy acknowledges the role biodiversity plays, not only in many natural processes, but also in the direct and indirect economic, social, aesthetic, cultural and spiritual benefits that we derive from it.

The Strategy also acknowledges that pressures brought about by our own actions and by other factors, such as climate change, have resulted in damage to the biodiversity of Wales and calls for a halt to this loss and for the implementation of measures to bring about a recovery. Local Wildlife Sites provide essential support between and around our internationally and nationally designated nature sites and thus aid our efforts to build a more resilient network for nature in Wales.

The Wildlife Sites Guidance derives from the shared knowledge and experience of people and organisations throughout Wales and beyond and provides a common point of reference for the most effective selection of Local Wildlife Sites.

I am grateful to the Wales Biodiversity Partnership for developing the Wildlife Sites Guidance. The contribution and co-operation of organisations and individuals across Wales are vital to achieving our biodiversity targets. I hope that you will find the Wildlife Sites Guidance a useful tool in the battle against biodiversity loss and that you will ensure that it is used to its full potential in order to derive maximum benefit for the vitally important and valuable nature in Wales.

# GUIDELINES FOR THE SELECTION OF LOCAL SITES IN WALES

Copies of this document can be obtained from: http://www.biodiversitywales.org.uk/

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**SPECIES GUIDELINES**

# PART 1

# INTRODUCTION

# 1.0 PREFACE

These guidelines have been developed in response to Action Point 38 of the first action plan of the Environment Strategy for Wales through discussion and consultation with a wide audience that has included experienced ecologists, LBAP officers, county recorders and local naturalists over a period of years.

Terminology
Many titles are used for biological Local Sites, including, Biological Heritage Site, Site of Nature Conservation Interest (SNCI), Sites of Interest for Nature Conservation (SINC), Site of Biological Interest and Site of Community Interest, whilst the term 'Wildlife Site' is the title preferred by the UK Wildlife Trusts Partnership.

In Wales, Site of Interest for Nature Conservation (SINC) is the recognised term used in WAG planning guidance and local planning policies for biological Local Sites. It is suggested that SINC continues to be used in that context, a SINC may be considered a Wildlife Site when owner's agreement, management advice and/or assistance, and potentially funding have been provided.

Local geological sites are called RIGS, Regionally Important Geological Sites, recognized by WAG planning guidance and local planning policies.

# 2.0 BACKGROUND

The origins of biological Local Sites systems stretch back to the 1970s where Wildlife Trusts in UK wished to protect and encourage the management the whole biodiversity resource within a given local government area. The idea behind Local Site systems based upon local planning authority [LPA] and now Local Biodiversity Action Plan Partnership [LBAP] areas in Wales, being to provide an inclusive system of sites to support and re-enforce the features of statutory designated sites.

Within Wales, the North Wales Wildlife Trust and the Powys Wildlife Trusts and a partnership Gwent and Wildlife Trust for South and West Wales published biological guidelines and criteria in 1999, Clements, D.K. & Pryce, R.D. (1999). and the latter document was further revised in 2004, (Bode, G. 2004). All three systems were based, upon Hawkswell, S. (Ed.) (1997).

At present, where Local Sites systems are operating in Wales, the system is managed by local authority /LBAP staff with help from the Wildlife Trust, and LBAP partnership, with the exception of Powys, where the system is managed on a county based by the three constituent Wildlife Trusts, Montgomeryshire, Radnorshire, and Brecknockshire.

This document sets out a common set of detailed guidelines for the selection of biodiversity Local Sites in Wales based on an amalgamation of the detailed criteria of the three spatially separate systems developed by the North Wales Wildlife Trust, the Powys Wildlife Trusts, and the Gwent and Wildlife Trust for South and West Wales. The guidelines provide a framework within which individual Local Biodiversity Action Plan Partnerships [LBAPs]/ Local Planning Authorities are free to refine their own detailed criteria for the selection and designation of Local Sites within their administrative boundaries. The result should be a robust and defensible Wildlife Site system, which is appropriate for application by all of the LBAP areas in Wales, yet flexible enough to allow tailoring to reflect local priorities and circumstances.

Local biological sites refer specifically to sites of substantive nature conservation value. They are the most important places for wildlife outside legally designated sites, and their importance and significant is in the linkages they provide in a local context between the internationally and nationally designated sites the whole biodiversity resource within a given LBAP area. The some of the total known S42 habitat resource is shown by habitat in Appendix 2 and by LBAP partnership area in Appendix 3 together with

minimum proposed targets. The total area of designated sites, and that which should be considered SINC is the total area, length or number of sites given by habitat type in Appendix 1 and by LBAP partnership area in Appendix 2.

The use of Local Sites as a method of identifying the most important habitat resources within a particular administrative area is common throughout the UK, with most Wildlife Site systems being managed either by the appropriate Wildlife Trust, Biological Records Centre, Local Authority/Local Biodiversity Action Plan Partnership [LBAP] or a combination of these.

The selection of Local Sites to help maintain and sustain the biodiversity resource should be founded on Wales and Local Biodiversity Action Plan (LBAP) priorities, complementing the full range of habitats and species. Other habitats and species should also be considered if they contribute substantially to local biodiversity, and would be judged a priority based on an evaluation of the relevant factors, even if not currently selected as such within the relevant Local Biodiversity Action Plans.

# 3.0 POLICY FRAMEWORK

Biodiversity

The UK government's response to the United Nations Environment Programme Convention on Biological Diversity [C.B.D.] signed at the 'Rio Earth Summit' in 1992, was to produce the Biodiversity: The UK Action Plan, (Anon, 1994). The UK action plan overseen by a steering group has provided a succession of habitat targets since, most recently in 2006. The 2006 UK maintenance targets for some Welsh priority habitats are given below:

| Priority Habitat | UK Target |
|---|---|
| Wood Pasture and Parkland | No loss |
| Native Woodland | No net loss |
| Lowland Dry Acid Grassland | No loss |
| Lowland Calcareous Grassland | No loss |
| Lowland Meadow | No loss |
| Coastal Floodplain and Grazing Marsh | No net loss |
| Lowland Heathland | No net loss |
| Lowland Fen | No loss |
| Purple Moorgrass and Rush Pastures | No loss |
| Reedbed | No loss |
| Lowland Raised Bog | No loss |
| Limestone pavement | No loss |
| Maritime Cliffs and Slope | No net loss |
| Coastal Sand-Dune | No net loss |
| Coastal Vegetated Shingle | No net loss |
| Coastal Saltmarsh | No net loss |
| Intertidal Mudflats | No net loss |

**Natural Environment and Rural Communities Act 2006**

**40 Duty to conserve biodiversity [**enacted on 1st October 2006]

(1) Every public authority must, in exercising its functions, have regard, in so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.

(2) In complying with subsection (1), a Minister of the Crown, government department or the National Assembly for Wales must in particular have regard to the United Nations Environment Programme Convention on Biological Diversity of 1992.

(3) Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

(4) "Public Authority" means any of the following-

(a) a Minister of the Crown;
(b) the National Assembly for Wales;
(c) a public body (including a government department, a local authority and a local planning authority);
(d) a person holding an office-
(i) under the Crown
(ii) created or continued in existence by a public general Act, or
(iii) the remuneration in respect of which is paid out of money provided by Parliament
(iv) a statutory undertaker.

(5) In this section-
"local authority" means-
(a) in relation to England, a county council, a district council, a parish council, a London borough council, a Common Council of the City of London or Council of the Isles of Scilly;
(b) **in relation to Wales, a county council, a county borough council, or a community council**;
"local planning authority" has the same meaning as in the Town and County Planning Act 1990 (c.8);
"Minister of the Crown" has the same meaning as in the Ministers of the Crown Act 1975 (c.26);
"statutory undertaker" means a person who is or is deemed to be a statutory undertaker for the purposes of any provision of Part 11 of the Town and Country Planning Act 1990.

**42 Biodiversity lists and action (Wales)**

(1) The National Assembly for Wales must, as respects Wales, publish a list of the living organisms and types of habitat which in the Assembly's opinion are of principal importance for the purpose of conserving biodiversity.

(2) Before publishing any list the Assembly must consult with the Countryside Council for Wales as to the living organisms or types of habitats to be included in the list.

(3) Without prejudice to section 40(1) and 40(2), the Assembly must

(a) take such steps as appear to the Assembly to be reasonably practicable to further the conservation of the living organisms and types of habitat included on any list published under this section , or
(b) promote the taking by others of such steps.

(4) The Assembly must, in consultation with the Countryside Council for Wales-

(a) keep under review any list published under this section,

(b) make any revisions of any such list as appear to the Assembly appropriate, and
(c) publish any list so revised.

**Environment Strategy for Wales**
The National Assembly for Wales published an Environmental Strategy for Wales [ESW] in 2006 listing a number of biodiversity targets and outcomes:

- By 2010 95% of international sites in favourable condition.
- By 2015 95% of Welsh SSSIs in favourable condition.
- By 2026, all sites in favourable condition

**ESW Outcome 19 "**The loss of biodiversity has been halted and we can see a definite recovery in the number, range and genetic diversity of species, including those species that need very specific conditions to survive."

**ESW Outcome 20** "The wider countryside is more favourable to biodiversity through appropriate management, reduced habitat fragmentation and increased extent and interconnectivity of habitats."

**ESW Outcome 21** "Sites of international Welsh and **local importance** are in favourable condition to support the species and habitats for which they have been identified"

Sites of local importance are SINCs and RIGs, representing local biodiversity and geodiversity sites of importance.

**Wales Policy Wales 2002**
Mentions Special Landscape Areas and SINCS based on landscape, nature conservation or geological value…local planning authorities should apply these designations to areas of substantive conservation value where there is good reason to believe normal planning policies cannot provide the necessary protection. Unfortunately it also states that *"Such designations should not unduly restrict acceptable development*".

**Technical Advisory Note (TAN) 5 Nature Conservation and Planning 1996**
States:
**28."***Statutory and non statutory sites together with features which provide wildlife corridors, links or stepping stones from one habitat to another, all contribute to the network necessary to ensure the maintenance of the current range ands diversity of our flora, fauna, geological and landform features and the survival of important species. Sensitive landscaping and planting, the creation, maintenance and management of landscape features important to wildlife and the skilled adaptation of derelict areas can provide extended habitats"*

**29**." *Non-statutory sites of local nature conservation importance (often known as Sites of Importance for Nature Conservation (SINCS) should be both selected and designated according to clear and strict criteria which ensures the sites are of substantive nature conservation value. Regionally important geological/geomorphologic sites (RIGS) should also be selected and designated according to strict criteria.*"

**Consultation Draft Technical Advisory Note (TAN) 5 Nature Conservation and Planning 2006**
This consultation was prepared prior to the European Court of Justice's judgment in Case C6-04 Commission v UK, and the UK is currently considering its response to that judgment and the draft TAN will be revised in the light of that response before it is issued in its final form.

The present document is available at
http://new.wales.gov.uk/consultations/closed/plancloscons/1208018/?lang=en

The Consultation Draft TAN 5 Nature Conservation and Planning 2006:

- makes a very clear link between biodiversity conservation and sustainable development (pages 10 par 1.5.1, 11 par 1.6.1)
- recognises the fact that healthy functioning ecosystems support a better quality of life (pages 10, par 1.5.1; 14, par 2.4)
- encourages the incorporation of biodiversity action within every appropriate development proposal (page 10 par 13)
- refers to strengthening the links and delivery pathways between local development plans and national and local BAPs (page 12 par 1.7.4)
- makes reference to the delivery of Biodiversity Action Plans and Local Biodiversity Action Plans with the requirement for positive planning for nature conservation (page 13 par 2.1)
- includes a key principle that plan policies and decisions should be based upon up-to-date environmental information (page 13 Par 2.2)
- makes reference to Article 10 of the Habitats Directive and the importance of protecting networks of natural habitats with policies in unitary development plan documents (page 15 par 3.2.2; 16 par 3.3.2)
- cites the requirement for Supplementary Planning Guidance to provide more detailed guidance of ways the planning system can deliver LBAP objectives and the targets of HAPs and SAPs (page 17 par 3.4.2)
- recognises the role of Local Sites in contributing to biodiversity and geodiversity conservation (page 40 par 5.7 onwards)

## Potential Local Development Plan Policies

### Strategic policy

The Assembly government is committed to halting biodiversity loss by 2010 and has set minimum targets for habitat creation for **add LPA name**. The strategic policy given below will guide all development in the County Borough.

*The Council's distinctive natural heritage will be preserved and enhanced by protection from inappropriate development. Where appropriate, development proposals will include environmental assessment and will not be permitted where unacceptable harm will be caused to any of the following:*

*A) the character and quality of the landscape and the countryside*
*B) ecology, wildlife and earth science features of acknowledged importance, including those in urban areas*
*C) the quality of other natural resources including water, air and soil*
*D) the natural drainage of surface water*

*Where development is permitted, planning conditions and / or obligations will be used to protect or enhance the natural heritage. Where the benefits of development outweigh the conservation interest, mitigation and / or compensation measures will be required to offset adverse effects. Where appropriate, planning gain will be directed towards strategic mitigation sites* ***(add*** *as shown on the proposals map* ***where appropriate)****.*

## Sites of Importance for Nature Conservation (SINCs)

Sites of Importance for Nature Conservation are an important resource in add **LPA name,** covering significant areas of biodiversity priority habitats and species. Designation is based on objective scientific criteria for **ADD LA NAME** that accord with the Wales wide guidelines. Identified sites are shown on the proposals map/constraints map/in spg **(amend/omit to suit local circumstances)**, however, the policy will be applied to all sites that meet the criteria for designation (as recommended by the Planning Inspectorate with regard to the Monmouthshire UDP).

*Development will not normally be permitted where it would cause unacceptable harm to the features of a SINC, unless the development could not reasonably be located elsewhere or where the socio-economic benefit of the development is considered to outweigh the nature conservation value.*

*Where harm is unavoidable it should be minimised by effective mitigation measures to ensure that there is no reduction in the overall nature conservation value of the area or feature. Where this is not possible, compensation measures designed to conserve, enhance, manage and, where appropriate, restore locally distinctive natural habitats and species should be provided.*

*This policy applies to all sites that meet the criteria for designation.*

## Ecological Networks

Small, isolated populations of species are far more vulnerable to extinction than populations that can disperse and interbreed with other populations. The effects of climate change are likely to increase local extinctions among small isolated populations. It is important to maintain and enhance ecological networks of semi-natural habitats that have a high degree of connectivity. The Habitat Regulations (37) require planning policies which conserve features of the landscape that are of major importance for wild flora and fauna, including those linear features that are essential for the migration, dispersal and genetic exchange of wild species. Interpretation of this policy should have regard to relevant studies that identify important areas for ecological connectivity.

*Development that would contribute to the protection, enlargement, connectivity and management of important wildlife sites will be favoured.*

*Development will not normally be permitted where it would cause unacceptable harm to landscape features of major importance for wild flora and fauna, including wildlife corridors and stepping stones.*

## Landscape and biodiversity

Locally distinctive landscape features are also important for biodiversity.

*Development will not be permitted if it unacceptably affects features or networks of importance for landscape or nature conservation including:*
*trees, woodland, hedgerows, stonewalls, greenlanes, river corridors, ponds, wetlands, fridd, species rich grasslands, common land, saltmarsh, sand dunes etc.etc* ***(ADD OR SUBTRACT from list to suit local conditions)***

## Planning conditions - subject to revision on publication of revised TAN5

Where planning applications are granted permission, but mitigation, enhancement or compensation is required for habitats or species, there will be a requirement for the implementation of effective biodiversity planning conditions. These will often be identified as part of the recommendations of Environmental Impact Assessments or other ecological surveys required as part of the planning application, or they may include specific requirements identified by the Council or consultees in the planning process (including CCW, Environment Agency or Non-Governmental Organisations).

*Planning conditions will be developed where mitigation, enhancement and/or compensation measures are required to satisfy nature conservation planning policy, adopted supplementary planning guidance and/or issues relating to the habitats and species affected.*

## Planning Obligations

Planning obligations will be employed where mitigation, enhancement or compensation requires a longer-term or more complex commitment than can be effectively achieved by planning condition, or where a financial contribution and /or a transfer of land is required.

*Planning obligations (usually in the form of S.106 Management Agreements) will be developed where biodiversity mitigation, enhancement or compensation measures cannot be reasonably achieved by planning conditions. In particular, planning obligations will be used to secure the transfer of biodiversity mitigation land and commuted management sums to the Council (or third party management bodies) and to secure other long-term management and monitoring schemes.*

## Supplementary Planning Guidance

The Wales Biodiversity Partnership Paper **WBP12 PAPER 03/06/07** tabled at the WBP meeting on the 8th Nov 2006 and due to be published as Annex H to the Wales Biodiversity Framework, advises the following with regard to **Supplementary Planning Guidance (SPG)** **"**The Aim of a Biodiversity SPG is to raise the profile of biodiversity issues in planning, provide more detailed guidance to planners and developers to ensure that biodiversity is taken into account in all development proposals and to strengthen links between the LBAP and the Local Development Plan. Currently some LBAPs have been adopted as SPG for the Unitary Development Plan. The advice is being reviewed regarding SPGs for the new Local Development Plans (LDPs)

• As local authorities develop their LDP, LBAP Partnerships should develop a separate Biodiversity SPG allowing the LBAP to remain more flexible. The Biodiversity SPG should reference the LBAP for lists of species and habitats and other biodiversity information, and also to the local wildlife sites database.
• Biodiversity considerations should be fully incorporated into any SPG for the Conversion of Agricultural Buildings or similar.

*The council shall prepare Supplementary Planning Guidance on Biodiversity to ensure that habitats and species listed in the Local Biodiversity Action Plan are adequately accommodated in any planning proposals. Development proposals affecting Biodiversity Action Plan habitats and species must demonstrate how these habitats and species can be protected, mitigated and where possible enhanced.*

## Local Sites in a local planning Context

A Local Site system is an information tool. It does not select sites for one specific purpose but identifies a suite of sites that contribute to the natural capital of the local area. All sites which meet the local criteria should therefore be selected as SINCs. The non-statutory designation can then be used to inform decisions made by a wide variety of individuals and organisations.

Any one intended use of the system does not have a bearing on whether or not a site is to be selected; that is entirely dependent on its nature conservation interest. Current Planning Guidance advises that Local Planning Authorities should identify relevant conservation interests in Local Plans and make sure that the protection and enhancement of those interests is properly provided for in development and land-use policies. It further recommends that Local Authorities should take Local Sites into account in Local Plans and indicates that "nature conservation issues should be included in surveys of Local Authority areas to ensure that the plans are based on fully adequate information about local species, habitats, geology and landform".

Local Authorities should ensure the establishment and maintenance of up-to-date Wildlife Site systems within their area. Local Wildlife Site systems should be co-ordinated through local partnerships involving relevant local planning authorities, land owning bodies, statutory bodies, LBAP partnerships, local Wildlife Trusts and other relevant bodies. Government advice and policy should be directed in ways that empower local authorities to more effectively secure the objectives of local partnerships through the planning process.

Wildlife Site systems should ensure that land managers are involved in the development of the system and have a clear understanding of its purpose and operation. Appropriate systems must be in place for managing data used or generated during Wildlife Site survey, assessment or monitoring. For biological data this should be through Local Records Centres linked to the National Biodiversity Network. Landowners and managers should be consulted about access to their land for the purpose of surveys etc, and any data thus collected should be shared with them accordingly.

Under the guidance of the local authorities, partnerships should consider (for their area) the issue of "What range of biological and geological features are the priorities for conservation?" and "How much of this feature needs maintaining to be sustainable?" The partnership should go on to consider which sites of "substantive nature conservation value" need to be selected to satisfy this objective using the Ratcliffe Criteria.

Partnerships should establish a Panel of relevant experts to manage the process of identifying "sites of substantive nature conservation value" within the local context. The Panel should establish formalised processes for selecting sites following these Guidelines, which should be documented and endorsed by the partnership. The basis for individual site selection should be recorded for each site in terms of the species, habitat or feature for which it was judged to be of substantive value and the criteria on which it was selected.

Landowners should be notified when sites in their ownership are selected and given an opportunity to make observations relating to the reasons for selection, should they wish, prior to formal notification. All landowners and occupiers should be informed when sites on their land have been selected as Local Sites and what the nature of the interest is.

Planning Authorities, Utilities, Statutory Agencies and other relevant bodies should be informed of the location and interest of local Wildlife Sites. Those running Wildlife Site systems should seek to co-ordinate the provision of support and advice to land managers for the positive management of sites through the partnership. Wildlife Site systems should be used as a means of targeting by those who provide advice and support for land managers.

Sources of funding for the management of sites should be targeted towards Local Sites as well as other sites. Particular priorities should include agri-environment schemes, through section 134 of the Environmental Protection Act 1990, and Local Authorities, entering into management agreements through section 39 of the Wildlife and Countryside Act 1981, as well as planning conditions and Section 106 Agreements attached to planning proposals.

As well as taking on some responsibility themselves, Local Authorities should encourage partners to contribute directly to the running of the Wildlife Site systems by committing staff time and financial resources. Local Authorities and partnerships should ensure that Wildlife Site systems for their area are in place and fully compliant with this guidance. Individual Wildlife Site systems should review site presentation, achievements and processes at least once every ten years.

## 4.0 THE GUIDELINES

A successful biological Local Site system requires rigorous criteria to enable SINCs to be identified. This document provides Guidance for individual LBAPs or regional combinations thereof to use as a framework for developing their own SINC criteria, allowing appropriate local characteristics and features to be considered accordingly, e.g. Anon (2006). The system can then demonstrate to Local Authorities, landowners, land managers and others why a particular site has qualified or not.

General guidelines for choosing and evaluating sites of nature conservation importance were first formulated by Ratcliffe (1977) in the *UK Nature Conservation Review*. These guidelines represent general principles and factors to be taken into account when considering the nature conservation value of a given site, rather than defined or quantified factors to be assessed. Collis & Tyldesley (1993) and the Wildlife Sites Handbook (Hawkswell 1997) both present a modern interpretation and summary of these well-known guidelines with respect to Wildlife Sites.

A good model for the selection of SINCs is considered to be the criteria used in selecting the national series of Sites of Special Scientific Interest (NCC 1989, as amended). The scientific basis of this system is broadly accepted although this system was developed for the selection of a representative series of specimen sites of national significance, and is not therefore suitable for direct application in the evaluation and selection of sites in the local (i.e. sub-national) context.

The guidelines have been through an extensive consultation and revision process, extending over several years. They will be subject to active use and testing in the Local Authority areas. Revision and refinement of the guidelines will take place on a regular basis.

It has become usual practice to differentiate between habitat-based and species-based guidelines when creating a framework for the identification of SINCs. Some sites may be significant entirely because a certain species is present, whilst others may be significant because they contain a threatened habitat type which is intrinsically of interest. Most sites however, will be of interest on both grounds.

### Habitat-based Guidelines

The habitat guidelines are structured according to the draft S42 list (WAG, 2007) using the broad habitat categories, such as Broadleaved, Mixed, and Yew Woodland and Fen, Marsh and Swamp and within each itemising the specific priority habitat concerned where specific thresholds for inclusion are set. Representative species indicator lists for South Wales and Powys are given in Appendix 1 as examples. Some non-priority habitat categories are included.

The guidelines should ensure inclusion of all except degraded examples of habitats of national importance, which in themselves should make up part of the restoration target for that habitat within that

given area. Typical examples of nationally threatened biodiversity habitats include, *inter alia*, lowland heathlands, lowland calcareous grasslands, lowland meadows and purple moorgrass and rush pasture, all of which have no loss national Wales biodiversity targets.

The guidelines should also ensure inclusion of habitat types which may not be threatened nationally but which are either rare in the LBAP area under consideration, or are especially distinctive or characteristic of the area. LBAPs are ideally placed to refine the identification of these regional and local priorities to allow for local distinctiveness.

The distinction between lowland and upland habitats has been emphasized in the guidelines that apply to the designation of mosaic habitats as Wildlife Sites, with occasional reference in the descriptions of some of the other habitat guidelines. Lowland habitats are here defined as areas, which lie below the uppermost enclosure boundary ('the ffridd/coed cae boundary'). In practice, this often lies at an altitude of about 300m. Upland habitats are here taken to comprise those that lie above the uppermost enclosure boundary.

The habitat-based guidelines generally deal with vegetation characteristics, concentrating on vascular plants. However appropriate regard is also given to the physical elements of habitats, particularly where these are insignificant for vascular plants but crucial for fauna or lower plants. Given the difficulty of survey and identification for invertebrates and lower plants it is crucial that key physical features for such groups are recognised by habitat guidelines. These features include the presence of varied sward height and bare ground in many vegetation types, the presence of significant quality of standing and fallen dead wood, the presence of veteran trees, and the presence of soft cliffs and exposed riverine sediments etc.

Many of the habitat-based guidelines refer to the National Vegetation Classification (NVC) (Rodwell 1991 et seq.). However selection of appropriate SINCs can still be undertaken if the determination of NVC type has not been made, or where analysis of quadrats from representative samples of the vegetation community in question indicates that the vegetation is not readily referable to an NVC type. This can be achieved by application of key 'Ratcliffe Criteria', particularly species diversity. To this end, lists of indicator species have been compiled for certain habitats for South Wales and Powys, (Appendix 1) as examples of what can be done in all areas. Where considered appropriate, this has can be accompanied by a threshold number of species which will generally need to be reached before a site can be selected as a SINC on the basis of its vegetation type and diversity.

Lists of indicator species are especially valuable in instances where an NVC type can contain examples of a wide range of quality, such as the MG6 semi-improved lowland meadow. A species-rich MG6 grassland containing a reasonably large number of indicators of unimproved grassland will be worthy of selection, whilst a relatively species-poor MG6 grassland with few such indicators will not merit immediate selection as a SINC, and therefore may require adding to the restoration target category.

The species lists are comprised of native species, or archaeophytes as indicated by the New Atlas of the British and Irish Flora (Preston, Pearman and Dines 2002), which are characteristic of the vegetation type in question. In the case of the grassland, species that are regularly found in agriculturally improved grasslands are generally excluded from the species lists. Examples of those plant species rare enough to merit SINC designation on the basis of their presence alone in South Wales can be found in the Vascular Plant section (S7), together with their UK RDB status, Cheffing, C.M. & Farrell L. (Eds.) Dines, T.D., Jones, R.A., Leach. S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I (2005).

The species lists and appropriate threshold values given in this document are examples were drawn up by experts familiar with South Wales and Powys habitats, and refined by field survey and analysis. This approach has been developed to ensure sites with appropriate quality, as recognised by balanced application of the Ratcliffe Criteria, are selected as Wildlife Sites, and should be considered for use in other parts of Wales. Anomalies may occur; e.g. sites on calcareous substrates may qualify against the Wildlife Site threshold for neutral grasslands, but not for calcareous grassland, or vice versa. However

the key factor in such cases will be that the site is of sufficient quality to merit recognition of substantive nature conservation value through Wildlife Site designation.

### Special Cases - Mosaic Habitats

Mosaic sites, comprising complex mixtures of semi-natural habitats, are acknowledged to be problematic when determining guidelines for Wildlife Site selection. Such sites may not contain any habitats that are intrinsically of very high interest, but may nevertheless be extremely important for the range of species they support. Further detail on the selection of mosaic habitats can be found in the Habitat Guidelines, section H16 Mosaic Habitats.

## Species-based Guidelines

Sites may be selected because they support individual species, which are rare or threatened, or communities of species, which are interesting or characteristic. Individual species of interest may be:

- rare or threatened throughout their range in Britain, in which case all populations are likely to be of significance;
- rare or threatened in the regional and/or local context, but comparatively common elsewhere in Britain, in which case all populations are likely to be of particular significance;
- rare or threatened elsewhere in Britain, but comparatively common regionally or locally, in which case some major populations are likely to be of significance.

Good assemblages or communities of species which are particularly characteristic of the region, or of a particular habitat type or feature, may also be considered for inclusion even though many of the species involved may be comparatively widespread and common (e.g. ancient woodland beetles, arable weed assemblages).

Unless otherwise stated it is assumed that the sites selected support established, resident populations of the species mentioned, and that these are 'critically dependant' on the site – i.e. they would not be present in the location or its general vicinity in the absence of either the site or certain key features within it.

Sites which are known to support populations of species which are:

- listed in the EC Habitats Directive, Annexes II and IV;
- listed in the Section 42 list of Species of Principle Importance for the Conservation of Biodiversity in Wales, under its obligations with respect to the NERC Act 2006, specifically were site or habitat condition action is specified;
- listed having a significant conservation designation on the UK listing with the JNCC, http://www.jncc.gov.uk/page-3409
- listed on Schedules 1, 5 and 8 the Wildlife and Countryside Act 1981 (as amended)

Should automatically be considered for selection as Wildlife Sites, although it should be clear that the species concerned are either established residents or are in some way dependant on the site for their survival in the locality. This may present difficulties when dealing with mobile species which may depend on a variety of different habitats at various times in their life cycle or at different times of year.

Sites should also be considered where these support species which are listed as 'Species of Conservation Concern', or for species which are rare, uncommon or threatened in the local context, especially where large or well-established populations are present. Assessing the comparative rarity of locally significant species and setting appropriate guidelines for selection is significantly more difficult in the absence of well-organised biological recording at the regional or local level. LBAPs should assist in the

identification of local priorities, but there are likely to remain significant gaps in the data sets until such time as there is a more consistent approach to biological recording in the region. In the meantime the precautionary approach should be applied positively when selecting species-based Wildlife Sites, i.e. preferring to select sites which can be deleted at a later date when better species information becomes available.

The Species Guidelines generally relate to broad taxonomic groups of species, which are listed in the relevant publications cited. These lists are often updated and should therefore be monitored for changes that may affect the status of Local Sites selected on these grounds. Wherever possible English names have been given for the species listed in the guidelines, and scientific names are given for each group apart from the birds, which are generally known by their English names.

It is important to note that records for species are continually being updated. This document is a working version and will be updated accordingly on a regular basis. It should also be underlined the importance of liaising with species recorders and local recording groups in the process of locating and designating sites, so accurate and up to date survey information can be used as often as possible. Local Sites should normally be identified only on the basis of reliable field records. It should also be clear however that the monitoring of sites for the presence of a particular species can take place only as often as resources allow.

These guidelines cover terrestrial and freshwater species only. Guidelines for marine species await consideration by the appropriate specialists at some point in the future.

## 5.0 PRINCIPLES BEHIND THE GUIDELINES

The Wildlife Sites Handbook, Hawkswell, S. (Ed.) (1997) advices that the criteria for the selection of Local Sites on habitat grounds should consider the following primary elements:

- rarity
- size;
- naturalness/typicalness;
- diversity;
  and those secondary considerations could include:
- position in an ecological unit;
- potential value;
- fragility;
- educational/social value.

The following section describes the manner in which these elements have been dealt within the guidelines.

### Rarity

Habitat rarity has largely been addressed through the identification of individual habitat types which are considered to be threatened or of value either nationally or in the region, for example by reference to the UK BAP 'Priority Habitats' list. Other sources of guidance included the digitised Wales Phase 1 Survey and reports, *British Plant Communities* (Rodwell 1991 *et seq*).

The presence of a rare species is also a key consideration. Such species represent a feature in their own right whilst they are also very important as an element of the particular habitat or habitat mosaic on which they depend.

### Size

Size is a rather more complex consideration. It is generally recognised that larger sites are preferable to smaller sites, but it is extremely difficult to assign meaningful size thresholds in the majority of cases. Different scales are required for different habitats whilst the assessment of size as a consideration also depends on the frequency and abundance of the habitat in question at the local, regional and UK scale. Furthermore some very small sites may support populations of very rare species, whilst others may be of value to very large numbers of common species simply by virtue of their large size. It is therefore impossible to assess the suitability of a site for SINC designation by consideration of its size alone, and it must be recognised that size thresholds are particularly subjective and open to challenge. Minimum size thresholds for SINC designation do not appear in the guidelines. Providing that the quality of the site is sufficient, the smallest of sites can then be properly selected as a SINC. Further guidance can be found in the Site Boundary section.

### Naturalness/Typicalness

These factors are also difficult to quantify, although it is possible to assess how typical a given habitat is by comparison with, for example, published sources such as the detailed descriptions of UK plant communities provided by the National Vegetation Classification (*British Plant Communities*, Rodwell 1991 *et seq*). It is also possible to give a subjective, professional assessment of how much a habitat has been modified or degraded as a result of human activities, and to give preference to examples which are comparatively unmodified.

Use of the NVC in the Wales Local Sites Guidelines is acknowledged as being contentious for a number of reasons. The NVC community descriptions are not always strictly applicable in Wales, the main dataset on which it was designed having been largely compiled in England. This also means that the national distributions and estimates of the rarity of communities are somewhat misleading with respect to Wales, because of the comparative paucity of sampling carried out. Other problems lie in the amount of survey effort that is required to apply the NVC and difficulties in interpreting the data. Many of the LBAP partnerships in Wales do not have many members who are able to analyse NVC data, and there are probably none which would have the resources necessary to survey all potential Local Sites at NVC level.

Nevertheless, there are certain key classes of habitats where the NVC is very useful, for example neutral grasslands and marshy grasslands. Wales contains a number of very characteristic, widespread plant communities which are well described and readily identifiable using the NVC, and which are known to be of significance in both the regional and national (and sometimes even the international) contexts. With a little practice these communities can be recognised in the field and in most cases do not require detailed sampling. There are, however, also broad classes of habitat where the NVC is much less useful (e.g. dry woodlands) and where there are considered to be simpler methods of identifying potential value available.

## Diversity

Many habitats are intrinsically diverse, and this element may therefore be addressed automatically by the existence of these habitats within the site, especially where these are 'good' examples. Other habitats (e.g. Oligotrophic and Dystrophic Lakes, acid grasslands) have a diversity, which is naturally restricted, but which may nevertheless support specialised species, which are otherwise rare. Diversity within habitats is therefore deemed to have been addressed provided the site comprises or contains 'good' examples of specified priority habitats.

The diversity of a site can be assessed by comparison with the relevant plant community tables of the NVC, whilst the NVC community tables also include figures for the average number of species per quadrat for each vegetation community. However the approach taken to assessing the species diversity of certain habitats concentrates on the presence of a certain number of species from an indicator list of "quality" species. For some sites lower plants, fungi or fauna will be a key element of diversity.

Another aspect of diversity lies in the interaction between habitats. A potential SINC may contain a number of different, complimentary habitats, and in some cases these may have a combined value which is greater than that of the individual elements when considered alone. In situations where the individual elements each qualify for SINC selection on their own merits this does not present a problem, but merely reinforces the case for designation of the site. However, there may be some instances where the individual elements do not in themselves meet the guidelines, but which together have a combined value sufficient to warrant selection as a 'mosaic site'.

## Secondary elements

It is anticipated that in almost all cases, consideration of the secondary elements is unlikely to result in a site being selected if it does not also meet or exceed one or more of the primary elements listed above. However, the secondary elements may provide powerful reinforcement of the case for selection and they may be sufficient to merit promotion of a borderline site to SINC status.

***Position in an ecological unit*** may be an important consideration, especially in circumstances where a site forms a valuable adjunct to another SINC or SSSI, for example, or where a site

forms part of a linear complex joining several otherwise isolated sites together. This element is reflected in the approach taken to defining appropriate boundaries.

***Potential value***: There is general agreement that a site should only be selected where it already has substantive nature conservation value. Although some types of degraded habitats (e.g. bog, heathland) may qualify for selection on their own merits, the potential of a degraded site for enhancement or for conversion to a former condition of higher nature conservation interest is not a reason for selection *per se,* and these sites should be added to the restoration target category.

***Fragility***: The fragility of a given habitat is reflected to a great extent in the overall current extent of the habitat and its rarity. As a result fragility should not be a marked consideration provided the site meets the primary criteria at the time of selection. As with potential value, however, it is a valid point to bear in mind when considering the attributes of a given site and should be highlighted when considering the direction of management resources and funds in the future.

***Educational/Social value***: These 'non-scientific' criteria do not form an intrinsic part of the 'substantive nature conservation value' demanded by government guidance, but may nevertheless provide additional or supplementary justification for selecting a particular site, where this already meets one or other of the primary criteria above.

# 6.0 APPLICATION OF THE GUIDELINES

## Relationship with Nationally Designated Sites

Statutory Sites of Special Scientific Interest and non-statutory Local Sites do not generally overlap in Wales. This limits the risk of confusion amongst landowners, users and potential developers etc. concerning the legal status and protection of the land concerned. However, there may be some instances where it is appropriate to designate SSSI land as a Wildlife Site, especially where:

- a SSSI is notified on geological grounds, and is subsequently selected as a Wildlife Site because of its biological (i.e. nature conservation) interest;
- the SSSI reasons for notification omit to mention key features which qualify for Wildlife Site status;
- planning authorities have already shown biological SSSIs as Local Sites in strategic planning documents or supplementary planning guidance.

## Geological Sites

Many potential SINCs in Wales are also of geological or geomorphological importance in addition to their nature conservation significance, and there are other sites, which may have value and significance on geological grounds alone.

SINCs should be designated entirely on ecological grounds, without reference to geology except where this is a factor affecting or determining the ecological value, as in Inland Rock and Maritime Cliff and Slope habitats.

## Site Boundaries

Selection of site boundaries can be difficult and contentious. The following guidelines for the definition of site boundaries provides a framework which needs to be applied in a manner which is considered reasonable to the collective body of expert opinion formed by the

Countryside Council for Wales, Local Authority ecologists and non-statutory conservation organisations such as Wildlife Trusts. Key underlying principles represent the need to designate Local Sites of sufficient size to allow reasonable long-term ecological viability and continuation or introduction of favourable management.

Site boundaries should be drawn as far as possible to be meaningful in ecological terms. Where sites are selected on species guidelines, appropriate regard should be given to the habitat requirements of the species concerned.

Observable physical boundaries or topographic features should be used as boundaries wherever possible. Where only part of a management unit is of qualifying quality, the whole management unit can still be designated. Where areas (such as single fields) failing to meet the guidelines occur within a definable complex of management units (such as a block of fields), then the whole complex can still be designated as a Wildlife Site providing the qualifying areas form a clear majority of this Wildlife Site.

Boundaries should not generally include "buffer zones". However areas of land which marginally fail to meet any of the guidelines but which lie adjacent to qualifying habitat, and thus form part of an effective ecological unit, should be selected. Also there are exceptions when considering watercourses and other open water bodies where the aquatic habitat may be profoundly influenced by adverse management of the immediate bank side(s).

# 7.0 SITE SELECTION PROCESS

**Survey methodology**

In general any area of land or water which satisfies one or more of the guidelines is eligible for designation as a Wildlife Site. Sites should generally be evaluated on the basis of reliable information that is as up to date as possible. It should be stressed that the guidelines are not rigid criteria for site selection. The evaluation of sites must be undertaken with special reference to the particular context of the Local Authority area in which the site lies.

Extensive information is needed about the flora and fauna of an individual site to enable its evaluation against the guidelines and to ensure proper management. Initially a vegetation survey is completed which will also highlight the faunal interest likely to be important on the site. In additional, information relating to the history of the site and, if appropriate, its use by the local community may be collected. This will usually involve collating existing data and further survey work.

Every site vegetation survey completed should include information concerning:

- distribution of different habitats
- presence and abundance of different plant species in each habitat (either through NVC survey or using Phase 1 methodology with DAFOR information)
- recording the presence of uncommon, notable or rare vascular plant species with the location of such species identified on the accompanying site map
- recording of structures and features, such as fences, roads & buildings along with features of particular value to fauna such as invertebrates e.g. veteran trees, exposed riverine shingles & soft cliffs, bare ground and glades
- casual records of fauna, collected during the vegetation survey
- management regime (with any speculation being clearly indicated as such)
- potential threats
- communications made with landowners, managers or neighbours

- summary description of the whole site (including site name, name of surveyor, date of survey, grid reference, location, boundary, aspect, adjacent habitats)

Sites that are (or are potentially) important for particular species groups will need to be surveyed by a specialist. On occasions existing data may be available to enable evaluation for this feature. Asking local specialists or specialist recording groups to carry out these surveys may be necessary. Even where a site is thought to meet the guidelines for one feature, wherever possible the data should still be collected for all potential areas of interest to ensure a comprehensive understanding of the site's value. Where there are significant gaps in the knowledge about a site, these deficiencies should be indicated.

## Re-surveying and monitoring of Wildlife Sites

Regular re-survey and monitoring of Local Sites is essential to ensure the system is effectively protecting the sites and to determine where management effort requires to be focussed. If the system is to remain useful credible data must be kept up-to-date. In addition re-survey and monitoring will help to display wider species and habitat trends over a number of sites. Ideally 10% of the Local sites in any one LBAP area should be resurveyed in any one calendar year. Allowing a rolling programme of survey and monitoring of local sites, which will be augmented by specified surveys of some sites required by development control procedures.

# PART 2

# DETAILED GUIDELINES FOR SELECTION

## GEOLOGICAL SITES

A national framework for the identification and recognition of non-statutory geological sites already exists in the form of the Regionally Important Geological and Geomorphological Sites (RIGS) programme. Whilst not strictly comparable with Wildlife Sites, being concerned primarily with the identification of educational or demonstration sites, this programme nevertheless offers a separate mechanism for the identification and protection of geological sites.

Detailed guidelines can be found at http://www.ukrigs.org.uk/html/ukrigs.php , including access to local RIGS groups, and further useful information is available in Common Standards Monitoring Guidance on earth sciences available at http://www.jncc.gov.uk/pdf/CSM_earth_science.pdf .

# TERRESTRIAL AND FRESHWATER HABITATS

## H1) BROADLEAVED, MIXED, AND YEW WOODLAND

The Section 42 lists under the broad category of Broadleaved, Mixed and Yew Woodland, seven habitats namely:

- Traditional Orchards
- Wood Pasture & Parkland/ Parciau a phorfeydd coediog
- Upland Oak Woodland/ Coetiroedd derw yn yr ucheldir
- Lowland Beech & Yew Woodland/ Coetir ffawydd ac ywen ar dir isel
- Upland Mixed Ash Woodland/ Coetiroedd ynn cymysg yr ucheldir
- Wet Woodland/ Coetiroedd tir gwlyb
- Lowland Mixed Deciduous Woodland/ Coedlan gollddail yr iseldir

as habitats of principal importance for the conservation of biological diversity in Wales (WAG 2008).

All five Welsh native woodland HAPs have been combined into one set of generic Native Woodland HAP with combined targets, listed in Appendix 2. This reflects the fact that on the ground there is often a dynamic continuum between woodland types.

### H1:1) TRADITIONAL ORCHARDS.

Traditional Orchards represent a historic land use and have greatly declined in recent decades. Recent work by entomologists (e.g. Whitehead 1992) has shown that traditionally managed orchards support characteristic invertebrate faunas, including a number of rare specialist species. Characteristic plants include mistletoe (*Viscum album*), a very local species in the Wales. Many historic fruit varieties may persist in old orchards and are of potential value to fruit-growers

The following should be considered for selection:

- examples of undesignated orchards which are, or were, traditionally managed and which still contain a good scatter of old fruit trees

Traditional Orchards are a new habitat priority on the Section 42 list and awaits a national definition and targets although further information is available in Anon (2007).

### H1:2) WOOD PASTURE & PARKLAND

Parklands in this context include pasture-woodlands, the class of woodlands where deer and/or farm animals have historically been allowed to graze within a matrix of trees. These are taken to include both the traditional *wood-pastures* such as forests and chases, and wooded commons, as well as winter-grazed woodlands (Harding & Rose 1986).

'Over-mature' trees are here defined as being typically of large stature, and often supporting significant decay features such as dead timber in the canopy, heart-rot, root-rot, rot-holes, external fungal growths, loose bark, sap-runs etc. It may also include the standing trunks or fallen hulks and limbs of dead trees. The presence of characteristic assemblages of saproxylic invertebrates, epiphytic mosses and lichens, roosting bats and rare nesting birds etc (see Alexander 1999) should also be considered where appropriate. 'Over-mature' trees can be both native and non-native trees. Groups of large willow (*Salix* spp.) pollards may also qualify, where they do not already fall into Wildlife Sites based on watercourses (see H12). A separate recording form should be used for veteran trees designated as Wildlife Sites. The English

Nature publication, *An Introduction to Surveying Ancient Trees* provides a recommended survey methodology for surveying and recording veteran trees.

Further useful information is available in Common Standards Monitoring Guidance for woodland is available at http://www.jncc.gov.uk/pdf/CSM_woodland.pdf

The following should be considered for selection:

- undesignated parkland sites which are believed to have been derived from ancient woodland and which continue to support large mature trees
- undesignated parkland sites, of whatever origin, containing good numbers of large over-mature trees
- over-mature/veteran trees ≥ 3.7m circumference at 1.3m from base, or individuals that are estimated to be at least 200 years old which exhibit veteran tree characteristics such as rot hollows, bracket fungi or a large proportion of dead wood.

## H2:3) NATIVE WOODLANDS

The working definition for native woodland is woodland where at least 80% of the canopy comprises species that are suited to the site and are within their natural range, taking into account both history and future climate change. Definitions of what constitutes native woodlands in the Welsh HAP resource are found in FCS Guidance Note 20. All five Welsh native woodland HAPs have been combined into one set of generic native woodland targets. This reflects the fact that on the ground there is a dynamic continuum between woodland types. The setting of targets for individual types was deemed unrealistically precise, too complex and unduly prescriptive. However, this will not dilute the emphasis placed on nativeness and on achieving the right type of woodland for each individual site.

In Wales, the total area of existing native woodland is approximately 124,300 ha. Target values, listed in Appendix 2 and 3 assume that all native woodland (semi-natural and planted) will be maintained. The policy emphasis should be on preventing the loss of existing native woodland. There should be a presumption that loss should be negligible and only tolerated where there is a significant public benefit.

The following should be considered for selection:

- all undesignated ancient woodlands as recorded in the Ancient Woodland Inventories, apart from those felled and replanted with non-native species which have also entirely lost their ancient features such as characteristic ground flora
- undesignated semi-natural woodlands, of whatever size, which support an assemblage of ancient woodland indicator species (see Appendix 1, Table 1 for example)
- all undesignated semi-natural woodland with an upland oak woodland component
- all undesignated semi-natural woodland with a beech and yew woodland component
- all undesignated semi-natural woodland with an upland mixed ash woodland component
- all undesignated semi-natural woodland with a wet woodland component
- planted/re-planted wet woodland with semi-natural ground flora or other areas of interest such as ditches, pools and marshy areas

- all undesignated semi-natural woodland with a mixed deciduous woodland component

'Ancient woodlands' are defined as those which can be dated by documentary means to at least 1600 AD, or where there is other archaeological or ecological evidence which suggests similar antiquity, see under indicator species in Appendix 1, Rackham, O (2003). 'Semi-natural' woodlands contain a high proportion (i.e. ±70% or more) of native, locally-indigenous tree and shrub species, a combination regarded as having the highest nature conservation value (Kirby et al 1984).

'Indicator species' are species which are not, or seldom, found in woodlands which have not had a long continuity of woody cover, even though that cover may have been replaced by non-native tree and shrub species at some point in the site's history. Vascular plant indicators are the most readily familiar and identifiable group containing such species, but indicator species occur in many other taxa, including mosses, lichens, beetles, moths, flies and snails, amongst others. Further information on indicator species may be found, *inter alia*, in Alexander (1999), Harding & Rose (1986), Kerney & Stubbs (1980), Marren (1990), Peterken (2000), Rose (1993; 1999) and Stubbs (1987).

The list of semi-natural woodland vascular plants provided in Appendix 1, table 1 for South East Wales and Powys is for guidance only and not comprehensive. No minimum threshold of indicator species is given because this could vary significantly depending on the type of woodland under consideration. However, the aim should be to demonstrate the presence of a significant assemblage of such species. The figure required for significance will vary greatly due to circumstance, and is best judged by local experts in a case by case or LBAP by LBAP basis.

It should be noted that some indicator species might not necessarily be confined to woodland habitats: where they occur in woodlands, however, the woodland is usually of ancient origins. Examples include pignut (*Conopodium majus*), which occurs in both woodlands and grasslands, and stinking iris (*Iris foetidissima*), which also occurs on dune systems, etc.

Wet woodlands are typically dominated by alder (*Alnus glutinosa*), willows (*Salix* spp.) and/or downy birch (*Betula pubescens*). This category also includes sites where semi-natural wet woodland has been replanted with exotic species (e.g. cultivated poplar *Populus* spp.) or plantations of poplars on formerly open wet ground. Wet woodlands can be especially important for invertebrates.

The SSSI selection guidelines (NCC 1989) point out that the approach to the selection of woodland sites for designation inevitably differs from that for other habitats. Woods have a complex structure, which may be strongly influenced by past treatment, and in which the differing layers may vary more-or-less independently from each other. It is therefore not sufficient to describe or classify woodlands solely in terms of their woody communities or even by broader floristic classification such as the NVC.

Some parts of the woodland biota, e.g. rare plants, may be conserved in one small patch of woodland, whilst other aspects, such as the pattern of glades or the age structure of the trees, may require a very large area if they are to be sustained. For these reasons, the SSSI designation criteria focuses primarily on the broader elements of historical continuity and the overall naturalness of the woodlands under consideration: ancient and long-established semi-natural woodlands form the main 'pool' from which the SSSI series is drawn, irrespective of the individual woodland types which may be present. This approach has also been followed by the present study.

Notwithstanding this, the SSSI guidelines note that NVC communities W1-W7 (wet woodland), together with W13 (yew woodland) are all relatively uncommon and tend to occur as small, localised sites. Priority upland woodland in habitats in Wales includes oak woods of NVC communities W10e, W11, W16b and W17 and ash woods of communities W8 and W9.

The example lists of semi-natural woodland vascular plants (Appendix 1) are based in part on the list suggested by Walker & Buckley (1989) for Gwent, and from interpretation of Ellis (1983), Stringer & Davies (1989), Wade (1970) and Wade *et al* (1994). Not all of the species listed are confined to ancient woodlands, but in most cases where they occur in woodlands they are indicative of ancient woodlands. There may be inconsistencies in these lists due to the different sources used for the different counties.

Further useful information is available in Common Standards Monitoring Guidance for woodland is available at http://www.jncc.gov.uk/pdf/CSM_woodland.pdf and http://www.jncc.gov.uk/pdf/CSM_lowland_wetland.pdf for wet woodland.

## H1:4 SCRUB COMMUNITIES

Scrub communities do not feature as a specified UK BAP habitat type, and no priority habitat types of scrub have been identified. However as indicated above, this assessment ignores the ground flora and wider faunal interest, that scrub stands can have.

It is suggested that 'mixed scrub' habitats considered for selection should normally contain at least 6 native woody species and that there is good structural diversity, for example with a varied range of shrub ages and canopy heights, the presence of small rides and clearings, good gradations in edge habitats, varied ground flora etc.

Most scrub communities comprise common and ubiquitous woody species and are widespread in the UK. However, scrub habitats are extremely variable in form and composition, and even some of the common communities may be exceptionally rich in species (Hopkins 1996).

A particular case can be made for the selection of extensive, and diversely structured stands of gorse (*Ulex europaeus; Ulex galli*), even when few other woody species or other vascular plants of interest are present. Gorse supports a distinctive faunal community, with such characteristic species as dartford warbler (*Sylvia undata*) and stonechat (*Saxicola torquta*), along with a high invertebrate diversity. The complex rigid structure of gorse bushes is such that it is a noted habitat for spiders, for instance. Furthermore Britain, particular western Britain has this habitat represented very well, in contrast to the situation over much of the rest of Europe.

In South Wales, scrub is a particular feature of the coast, where it may be of significance for passage migrant and nesting birds, as well as supporting rare plants such as purple gromwell (*Lithospermum purpureocaeruleum*). Scrub is also widespread elsewhere inland, often forming habitat linkages between areas of higher quality habitat, for example along stream valleys and disused railway lines. In such situations it may be important in supporting the dormouse (*Muscardinus avellanarius*), a rare and protected species in Britain. Scrub habitats are also often of particular importance in maintaining the biodiversity of urban areas.

In addition to the above, scrub communities may also be selected where they form linking habitats between other features of interest, or form a peripheral part of another habitat of interest (i.e. as part of a mosaic site), or under the Species Guidelines where they support species of significance.

The following should be considered for selection:

- structurally-diverse and species-rich mixed scrub sites

- significant stands of gorse

## H2) BOUNDARY AND LINEAR FEATURES

Article 10 of the Habitats Directive requires Member States to "endeavour, where they consider it necessary, in their land use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora".

Some linear features include hedgerows, disused railway lines, green lanes, roadside verges and old drove roads. Whilst seldom supporting rare species, unmodified sections of linear features can be important in providing long corridors of semi-natural habitats, especially through built-up areas and intensive agricultural landscapes, often linking together series of smaller sites which might otherwise be isolated. Such features may have high invertebrate interest and be of special value for reptiles.

Where roadside verges are under consideration for selection the Grassland Habitat Guidelines (H5-7) should be consulted and the appropriate thresholds met for Wildlife Site qualification. Any grassland verges known to have been artificially created that meet the Grassland Habitat Guidelines should also be shown to have retained their nature conservation interest for a period of 10 years or more.

The following should be considered for selection:

- continuous sections of disused railway lines supporting semi-natural vegetation

- continuous sections of green lanes and other linear features which have either more-or-less continuous semi-natural woody boundaries on both sides, or wide flowery verges and/or unsurfaced trackways

## H2:1) HEDGEROWS

The Section 42 (WAG 2008) lists Boundary and Linear Features as a broad habitat category, within which Hedgrows are identified as a habitat of principle importance for conservation in Wales, with a revised name and expanded scope. Hedgerow targets are listed in Appendix 2.

Hedgerow systems and their associated standard trees are often remnants of ancient field boundary layouts and may be of critical value both as linear habitats and as habitat corridors, supporting very large and diverse populations of flora and fauna. Hedges may provide important habitats for dormice, a rare and protected species.

Hedgerows may often be included incidentally in Wildlife Sites which are designated for other reasons (e.g. grasslands) and where the hedges are of high conservation value this should be noted in the reasons for selection. However, good systems of hedges may also be a reason for selection in themselves.

The following should be considered for selection:

- all coherent sites which support close networks of interlinked hedges of which the majority (i.e. ≥50%) score grade 2 or higher when evaluated using the HEGS methodology (Clements & Tofts 1992)

- all coherent sites that support close networks of interlinked hedges of which the majority contain 5 or more native woody shrubs in a 30 metre sample and which qualify as 'Important Hedgerows', as defined in the Hedgerow Regulations (HMSO,1997).

  'close networks' in this context refers to sites in which the average field size is about 4.0ha or less.

- all those hedges that score grade 1 (including -1) when evaluated using the HEGS methodology (Clements & Tofts 1992)

### H2:2 CLODDIAU

Cloddiau, stone-faced earth banks characteristic of the western coastal counties of Wales were not including in the definition of Hedges (Anon, 2007), but should be included in the next review of priority habitats. In the interim, the following should be considered for selection:

- all coherent sites which have networks of cloddiau

## H3) ARABLE AND HORTICULTURE

### H3:1) ARABLE FIELD MARGINS

The Section 42 (WAG 2008) lists Arable and Horticulture as a broad habitat category, within which Arable Field Margins are identified as habitats of principle importance for conservation in Wales, with targets listed in Appendix 2.

The flora of arable fields across Europe has seriously declined, mainly as a result of the use of selective herbicides, seed-cleaning techniques and competitive crop variants. In Wales this loss has been compounded by conversion of fields to permanent pasture, and many characteristic species are now threatened, rare or extinct.

Arable field margins are strips of land that lie between intensively managed cereal crops and the adjacent field boundary. Such margins can take a variety of forms, but principally consist of either fallow ground (cultivated regularly, but not cropped), conservation headlands (crops grown using limited inputs of pesticide or none at all) or grass margins (infrequently cut or grazed grassy margins). Although the maximum width of a margin is 12m, species-rich areas can occur throughout traditionally managed arable land.

Both uncropped and unsprayed fields are important for a range of invertebrates and small mammals as well as several species of nesting and over-wintering birds, including skylark (*Aluada arvensis*), grey partridge (*Perdix perdix*) and brown hare (*Lepus europaeus*). Spring sown crops provide valuable breeding sites for lapwing (*Vanellus vanellus*). Unsprayed arable land supports an important group of arable weeds, many of which are now rare; within Wales these include broad-fruited corn salad (*Valerinella rimosa*), shepherds needle (*Scandix pecten-veneris*), together with cornflower (*Centuarea cyanus*), small flowered catchfly (*Silene gallica*), red hemp nettle (*Galeopsis angustifolia*) and purple ramping fumitory (*Fumaria purpurea*). Several notable lower plants are also associated with this habitat, and there are recent records of beaked beardless-moss (*Weissia rostellata*) from arable fields in Ceredigion and Monmouthshire. Many invertebrates utilise arable land in addition to a wide range of other habitats.

In crops where some weeds have been allowed to survive, several communities categorised under the National Vegetation Classification (NVC; Rodwell, 2000) as open vegetation may be represented; in Wales these include the *Papaver rhoeas – Viola arvensis* (OV3), *Chrysanthemum segetum – Spergula arvensis* (OV4), *Veronica persica – Veronica polita*

(OV7), *Matricaria perforata –Stellaria media* (OV9), *Poa annua – Senecio vulgaris* (OV10), *Poa annua – Stachys arvensis* (OV11) and *Stellaria media – Capsella bursa-pastoris* (V13) communities.

The following should be considered as an example for selection:

- All examples of fields that contain eight or more of the species listed in Appendix 1, table 2, for South Wales.

## H4) IMPROVED GRASSLAND

### H4:1) COASTAL AND FLOODPLAIN GRAZING MARSH

The Section 42 (WAG 2008) identifies Coastal and Flood Plain Grazing Marsh within the broad category of Improved Grassland as a habitat of principle importance for conservation in Wales.

Coastal and Floodplain grazing marshes provide important habitats for a range of plants and animals, particularly birds. Significant numbers of breeding waders, such as curlew (N*umenius arquata*) and lapwing (*Vanellus vanellus*) nest in the wet grassland and swamp habitats, and flocks of migratory wildfowl, including whooper swan (*Cygnus cygnus*) may graze the grassland during winter. Grazing marsh ditches or 'reens' are important for specialist invertebrates, vascular plants and bryophytes the conservation of which may depend on the sympathetic management of the adjacent grasslands. The ditches also provide important habitat for water vole (*Arvicola terrestris*) and otter (*Lutra lutra*), and ponds can also be a frequent feature of these landscapes and in some areas provide breeding sites for great crested newt (*Triturus cristatus*). Grazing marshes are also important for many nationally rare, scare and local plant species. Examples include bulbous foxtail (*Alopecurus bulbosus*), whorled caraway (*Carum verticillatum*), rootless duckweed (*Wolffia arrhiza*), round-fruited rush (*Juncus compressus*) and golden dock (*Rumex maritimus*).

Coastal grazing marshes occur in flat coastal situations, usually behind sea defences or natural barriers such as sand dunes, and are characteristically drained by a network of ditches or 'reens' containing standing water thoughout the year. They have commonly been derived from saltmarsh or freshwater swamp habitats. Floodplain grasslands occur in flat valley-floor situations and are also usually ditched or bordered by flood banks.

Improved grassland usually constitutes the dominant habitat cover, with semi- and unimproved grasslands making a much smaller percentage of the total grazing marsh resource, indicating extensive agricultural improvement. Unimproved floodplain grasslands are however of high conservation value and an integral part of the habitat despite their scarcity. Open water, swamp and fen habitats are also a widespread element of many coastal grazing marsh grasslands, often containing plant species associated with brackish conditions or physical features such as relict creeks and pans that reflect their saltmarsh origins.

The recent decline in the extent of coastal and floodplain grazing marsh can be contributed to causal agents that include drainage, agricultural improvement and intensification, nutrient-enrichment of watercourses, development pressure and flood prevention measures.

The following should also be considered for selection:

- examples of undesignated floodplain grassland and coastal levels which are extensive, subject to frequent inundation and support populations or communities of characteristic species, including at least one UK BAP Priority Species

## H5) NEUTRAL GRASSLAND

The Section 42 (WAG 2008) identifies Lowland Meadows within the broad category of Neutral Grassland as a habitat of principle importance for conservation in Wales. MG4, MG5, MG11, MG12 & MG13 are the neutral grassland types identified as being of greatest value by the SSSI selection criteria (NCC, 1989). These criteria also give special regard to species-rich MG6 grasslands.

### H5:1) LOWLAND MEADOWS

Lowland Meadows are those which have developed on soils which are not strongly of either an acidic or basic nature, and are typically of moderate fertility. Key grasses include species such as crested dog's-tail (*Cynosurus cristatus*), red fescue (*Festuca rubra*), common bent (*Agrostis capillaris*) and in some cases false oat-grass (*Arrhenatherum elatius*) and yorkshire fog (*Holcus lanatus*).

A list of species indicative of unimproved neutral grasslands in South Wales is given in Appendix 1 Table 3.

MG4 is a very scarce lowland alluvial meadow grassland type mostly confined to southern and central England. The extent of its occurrence in Wales is unclear but any examples present will be significant.

MG11 and MG12 grasslands are lowland, often coastal communities occurring on free-draining soils which are periodically inundated. MG11 occurs in fresh and brackish situations and is characteristic of coastal grazing marshes and river floodplain situations. MG12 is more exclusively coastal.

MG13 grassland is a somewhat commoner and more widespread community of moist or waterlogged soils, often in river floodplain, bankside or water meadow situations.
It is characterised by the presence of creeping bent-grass (*Agrostis stolonifera*) and marsh foxtail (*Alopecurus geniculatus*).

Other neutral communities of lesser value may also occur, including species-rich examples of MG1 *Arrhenatherum elatius* grassland or MG10 *Holcus lanatus-Juncus effusus* rush-pastures. The former may occur especially in situations such as roadside verges, old railway lines and abandoned rough grazing sites, and is typically dominated by tall grasses including false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*), together with forbs such as hogweed (*Heracleum sphondylium*), common knapweed, nettle (*Urtica dioica*) and thistles (*Cirsium* spp.). In richer examples, however, the sward has an 'understorey' of finer species typical of MG5 (see above). MG10 is more typical of wetland sites and is usually dominated by Yorkshire fog with creeping bent. Often these grasslands are present as important linking habitats between other grasslands and wetlands of significance.

Further useful information is available in Common Standards Monitoring Guidance for Lowland grassland at http://www.jncc.gov.uk/PDF/CSM_lowland_grassland.pdf

The following should be considered for selection:

- all examples of:
  - meadow foxtail - great burnet grasslands (MG4)
  - crested dog's-tail - common knapweed grasslands (MG5)
  - crested dog's-tail - marsh marigold grasslands (MG8)
- all relatively species-rich neutral grasslands (which could include MG1, MG6 & MG10) of any significant extent.

- examples of neutral grasslands that contain uncommon species, such as whorled caraway (*Carum verticillatum)* or adder's tongue (*Ophioglossum vulgatum)*.

## H6 CALCAREOUS GRASSLANDS

The Section 42 (WAG 2008) identifies Lowland and Upland Calcareous Grasslands as habitats of principle importance for conservation in Wales, with targets listed in Appendix 2.

Calcareous grasslands are confined to basic soils, which are usually of low fertility and often free-draining. Key grass species include upright brome (*Bromopsis erecta*) and sheep's fescue (*Festuca ovina agg.*) together with characteristic herbs such as common thyme (*Thymus polytrichus*), rockrose (*Helianthemum nummularium*), fairy flax (*Linum catharticum*) and salad burnet (*Sanguisorba minor*).

It is considered that all relatively diverse calcareous grasslands should be considered for selection as Wildlife Sites. Calcareous grasslands can also arise on post-industrial substrates, e.g. rail and road cuttings, quarries, ballast, flue ash or slag and spoil tips. The guidelines should be applied equally to habitats regardless of their origins.

'Semi-improved' grasslands include those swards which have been degraded by agricultural management but which are still recognisably derived from calcareous grassland. Only those semi-improved sites that are 'species-rich' should be considered as a Wildlife Site. 'Species-rich' in this context refers to those sites with at least 8 species present from the list of species indicative of unimproved calcareous grasslands in Table 3.

## H6:1 LOWLAND CALCAREOUS GRASSLANDS

Further useful information is available in Common Standards Monitoring Guidance for lowland grassland at http://www.jncc.gov.uk/PDF/CSM_lowland_grassland.pdf

## H6:2 UPLAND CALCAREOUS GRASSLANDS

Further useful information is available in Common Standards Monitoring Guidance for upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

The following should be considered for selection:

- all undesignated examples of unimproved lowland or upland calcareous grassland

- all undesignated examples of species-rich semi-improved lowland or upland calcareous grassland

## H7) ACID GRASSLAND

## H6:1) LOWLAND DRY ACID GRASSLANDS

The Section 42 list lowland dry acid grassland as a habitat of principle importance for conservation in Wales (WAG 2008). The SSSI selection criteria (NCC 1989) identify U1 sheep's fescue-common bent-sheep's sorrel grassland, U2 wavy hair-grass grassland and U3 bristle bent grassland NVC communities as being of greatest potential value.

The UK BAP goes on to define the Priority Habitat as comprising examples of U1-U3 grasslands, together with U4 sheep's fescue-common bent-heath bedstraw grasslands below 300m, and various coastal communities which tend to be of rare and localised occurrence (UK Biodiversity Group 1998).

Acid grasslands are comparatively scarce in the lowlands, being restricted to areas of nutrient-poor acidic soils, and frequently occur on old colliery tips. They are more characteristic of the uplands where they occur over extensive areas, although many of these have been subject to agricultural improvement or are in deteriorating condition due to neglect. Acid grasslands are characteristically rather poor in terms of plant species-diversity, but unimproved swards often support characteristic plant species, as well as a range of other wildlife including scarce or rare species.

'Unimproved' in this context refers to swards, which contain a high proportion of the species listed as community constants or preferential associates of the relevant NVC community as described by Rodwell (1992). A list of species indicative of unimproved acid grasslands in South Wales is given as an example in Appendix 1, Table 5. A site should be considered for selection if 7 or more of these species are recorded.

Other features may also include those areas with anthill populations. Anthills are a feature of ancient semi-natural grasslands and indicate their lack of any recent intensive farming practices such as ploughing. Not only are such features important for their invertebrate interest, they are also a historic feature, with some anthills often being in excess of 50 years old. The presence of anthills should be a contributory factor to a Wildlife Site designation. Where the anthill population is of a significant density, size and/or number this should be one of the primary reasons for a sites designation. It is known that those mounds of the yellow meadow ant (*Lasius flavus*) generally add roughly 1 litre of soil per year (Pickles, 1942), therefore estimates of age can be made by estimating the volume of soil in a mound. In old meadows some such anthills can contain 100 litres of soil and therefore can be estimated to be 100 years old.

U1 and U2 grasslands are comparatively widespread in Wales although chiefly of upland occurrence, the former often associated with upland crags and ledges. A variant of U1 is common on old colliery tips and along parts of old railways. Good examples of U4 grassland typically have high frequencies of species such as common bent-grass (*Agrostis capillaris*), sheep's fescue (*Festuca ovina*), sweet vernal-grass (*Anthoxanthum odoratum*), tormentil (*Potentilla erecta*) and heath bedstraw (*Galium saxatile*), and low frequencies of mesotrophic species such as Yorkshire fog (*Holcus lanatus*) and white clover (*Trifolium repens*).

Further useful information is available in Common Standards Monitoring Guidance for lowland grassland at http://www.jncc.gov.uk/PDF/CSM_lowland_grassland.pdf

The following should be considered for selection:

- all undesignated examples of unimproved lowland dry acid grassland
- all undesignated examples of semi-improved lowland dry acid grassland which retain a relatively high diversity of indicator species.
- all undesignated examples of areas where there are significant populations of anthills and/or where several are estimated to be in excess of 50 years old

## H6:2) UPLAND ACID GRASSLANDS

Upland acid grassland does not feature as a specified UK BAP habitat type.

Acid grassland dominates large areas of upland Wales, particularly where there has been a history of heavy grazing which has reduced the cover of ericoid species (e.g. heather) which would otherwise dominate this habitat once the tree cover had been removed. This upland acid grassland is of value as a semi-natural habitat. It supports a characteristic fauna, and short-grazed areas can be of great importance for grassland fungi.

Further useful information is available in Common Standards Monitoring Guidance for upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

The following should be considered for selection:

- all undesignated examples of unimproved upland acid grassland

## H8) DWARF SHRUB HEATH

The broad Dwarf Shrub Heath category of the Section 42 list (WAG, 2008) identifies Upland and Lowland Heaths as habitats of principle importance for conservation in Wales.

## H8:1) LOWLAND HEATHLAND

Lowland heathlands have become enormously reduced in extent through various human impacts, with an increasingly rapid decline in the period since the 1960's. The decline in the UK is estimated to be of the order of 85% in the last 200 years. Heathland is an internationally restricted habitat, with many of the communities that occur on the continent and elsewhere bearing very little floristic resemblance to those which occur in the UK. Heathland and grass-heath vegetation can be very extensive in the uplands, but large undegraded blocks are now uncommon. Old colliery spoil can support significant areas of dry heathland and in some cases older previously reclaimed sites are being encouraged to do so. The Phase 1 habitat survey manual (NCC 1990) stipulates that 25% dwarf shrub heath cover is required for habitat to be considered heathland. However, the 10% threshold for degraded heathland has been chosen with respect to these guidelines for Wildlife Site selection due to the importance of the habitat, and its growing rarity.

Further useful information is available in Common Standards Monitoring Guidance for lowland heathland at http://www.jncc.gov.uk/pdf/CSM_lowland_heathland.pdf

## H8:2) UPLAND HEATHLAND

Heathland vegetation occurs widely on mineral soils and thin peats (<0.5 m deep) throughout the uplands of Wales. It is characterised by the presence of dwarf shrubs at a cover of at least 25%. It includes both wet and dry heaths and is and usually above the upper edge of enclosed agricultural land generally at around 250-400 m.

Blanket bog and other mires, grassland, bracken, scrub, trees and woodland, freshwater and rock habitats frequently form intimate mosaics with heathland vegetation in upland situations. This definition recognises the importance of this habitat mosaic.

Upland heath in 'favourable condition' is typically dominated by a range of dwarf shrubs such as heather *Calluna vulgaris*, bilberry *Vaccinium myrtillus*, crowberry *Empetrum nigrum*, bell heather *Erica cinerea* and western gorse *Ulex gallii*. They are structurally diverse, containing stands of vegetation with heather at different stages of growth. Wet heath in 'favourable condition', should be dominated by mixtures of cross-leaved heath *Erica tetralix*, deer grass *Scirpus cespitosus,* heather and purple moor-grass *Molinia caerulea,* over an understorey of mosses often including carpets of *Sphagnum* species.

Upland heathland encompasses a range of National Vegetation Classification (NVC) plant communities. *Ulex gallii - Agrostis curtisii* (H4) and *Calluna vulgaris - U. gallii* (H8) are restricted to southern Britain. *Calluna - E. cinerea* (H10), *Calluna - V. myrtillus - Sphagnum capillifolium* (H21), and *Scirpus cespitosus - E. tetralix* (M15) are especially characteristic of western margins. *Vaccinium myrtillus - Deschampsia flexuosa* (H18) is generally widespread in the uplands but other communities are more local in distribution, notably *Calluna - D. flexuosa* (H9), *Calluna - Arctostaphylos uva-uri* (H16)and *E. tetralix - Sphagnum compactum* (M16).

The distribution of these communities is influenced by climate, altitude, aspect, slope, maritime influences and management practices including grazing and burning.

Further useful information is available in Common Standards Monitoring Guidance for upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

The following should be considered for selection:

- all examples of undesignated unmodified lowland or upland wet heathland and wet grass-heath, and where cross-leaved heath is still present even though reduced in its cover due to grazing pressure

- all undesignated examples of unmodified lowland or upland dry heathland

- examples of degraded heathland, secondary heathland and grass-heath mixtures which either meet the guidelines for designation as acid grassland (and are thus designated as such) or which have at least 10% dwarf shrub heath cover

## H9) FEN, MARSH, AND SWAMP

The UK BAP identifies 'Fen, Marsh and Swamp' as a single broad habitat. Within this category

- Upland Flushes, Fens and Swamps
- Lowland Fen
- Purple Moorgrass and Rush Pasture
- Wet Reedbed

are listed as habitats of principle importance for conservation in Wales on the Section 42 (WAG 2003).

## H9:1) UPLAND FLUSHES, FENS AND SWAMPS

The varying ground topography and geology of upland areas leads to the appearance of wet ground as water from the surrounding land is channelled into one area. Lateral movements through peat sediments, changes in underlying geology and human disturbance such as drains and peat cuttings can also encourage the development of areas of shallow standing water. These all lead to the development of fens and wet flushes in the uplands.

While not as diverse as lowland counterparts, the fens and flushes of the uplands are small but important components of the upland landscape. The standing water attracts water plants and a number of invertebrates species, included some that are typical of upland environments.

As with most upland habitats, the fens and flushes will occur as a mosaic with blanket bogs, wet and dry heath/grass areas, bog pools, exposed rock. Fens and flushes often occur as part of the Ffridd zone.

The availability of water may make these favoured areas by grazing livestock. While poaching and over grazing can be problems, an appropriate level of grazing can create further diversity within the habitat. Where few other water sources are available, these natural seepages are critical for watering stock and so their presence can enable grazing of the surrounding habitats.

The most common types of 'flush' in Wales are M6 acidic flushes, which in most cases occur in close association with larger mire, wet heath and marshy grassland complexes. Basic or neutral flushes are much rarer, containing a number of specialised communities, including M10 base-rich flushes which can occur in both uplands and lowlands but which are invariably small in size. Most small sites will probably fall within larger areas of surrounding habitats which also qualify for selection, however the nature conservation importance of flushes, with the range of higher plant, bryophyte and invertebrate interest that is likely to be present, justifies all unmodified flushes being considered for Wildlife Site designation.

Flushes normally occur on shallow mineral soils or peat <0.5m deep, and have a distinct flow of water passing through them at or immediately below the surface. In many cases flushes form part of a larger mosaic of related habitats and could be included with these. However, isolated examples of interest may also be encountered, especially in the lowlands where base-rich influences are present.

Further useful information is available in Common Standards Monitoring Guidance for upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

## H9:2) LOWLAND FEN

'Fens' are here defined as mire vegetation occurring on peat or mineral soils ≥0.5m deep, where the water level is at or just below the surface for most of the year. The water level in the mire is maintained either as a result of containment by the surrounding topography, or as a result of water running in from surrounding land. Bog moss (*Sphagnum* spp.) and/or sedges (*Carex* spp.), are usually important vegetation components, although consideration should still be given to the designation of degraded fens, where bog moss and sedges are greatly reduced in their abundance.

Three main types of fen are usually recognised, determined primarily by topographic features. These are 'valley mire' (fed by an obvious water flow), 'basin mire' and 'floodplain mire' (both formed as a result of impeded drainage), although in practice these may be difficult to distinguish. Fens may support vegetation more usually characteristic of other habitats such as marshy grassland, swamp and reedbeds.

'Swamp' comprises tall wetland vegetation occurring in situations where the water level is usually distinctly above the surface for much of the year. Swamps occur on a range of soils, but seldom on deep peat. The category includes reedbeds and tall marginal/emergent vegetation. In the uplands, these communities are most likely to be small and will probably form part of a mosaic with other surrounding habitats that may also qualify for selection.

A wide range of NVC communities may occur in Lowland Fens, including the tall herb communities S25-S28 and the mires M9-10, M13-14, M21 and M27 (see Rodwell 1991 for further detail). The UK is believed to support a large proportion of the remaining fen habitats in Europe (UK Steering Group 1995).

| **NVC Fens Communities include** : | |
|---|---|
| **M2** | *Sphagnum cuspidatum/recurvum* bog pool community |
| **M4** | *Carex rostrata - Sphagnum recurvum* mire |
| **M6** | *Carex echinata - Sphagnum recurvum/auriculatum* mire |
| **M10** | *Carex dioica - Pinguicula vulgaris* mire |
| **M15** | *Scirpus cespitosus - Erica tetralix* wet heath |
| **M16** | *Erica tetralix* wet heath |
| **M21** | *Narthecium ossifragum - Sphagnum papillosum* valley mire |
| **M23** | *Juncus effusus/acutiflorus - Galium palustre* rush pasture |
| **M24** | *Molinia caerulea - Cirsium dissectum* fen-meadow |
| **M25** | *Molinia caerulea - Potentilla erecta* mire |

| | |
|---|---|
| **M27** | *Filipendula ulmaria - Angelica sylvestris* mire |
| **M28** | *Iris pseudacorus - Filipendula ulmaria* mire |
| **M29** | *Hypericum elodes - Potamogeton polygonifolius* soakway |
| **M35** | *Ranunculus omiophyllus - Montia fontana* rill |
| **M37** | *Cratoneuron commutatum - Festuca rubra* spring |

Further useful information is available in Common Standards Monitoring Guidance for lowland wetland habitats at http://www.jncc.gov.uk/pdf/CSM_lowland_wetland.pdf

The following should be considered for selection:

- all examples of undesignated fen habitat, providing they are not grossly modified by agricultural improvement

## H9:3) PURPLE MOORGRASS AND RUSH PASTURES

Purple Moorgrass and Rush Pasture mainly comprise varying combinations of communities M22-M25 of the NVC, often in combination with elements of M15 wet heathland. These are commonly known locally as 'rhos pastures', although this term can also extend to include associated dry grassland and heathland elements as well. Some other mire communities of the NVC are also involved, in particular M27 meadowsweet – wild angelica mire.

M22 blunt-flowered rush-marsh thistle fen-meadow is an uncommon community nationally and is regionally rare, usually occurring as small patches on base-rich or mesotrophic, moist soils. The community is typically characterised by a dominance of blunt-flowered rush (*Juncus subnodulosus*) with species such as marsh thistle (*Cirsium palustre*), marsh horsetail (*Equisetum palustre*), meadowsweet (*Filipendula ulmaria*), Yorkshire fog (*Holcus lanatus*), greater bird's-foot trefoil (*Lotus pedunculatus*) and water mint (*Mentha aquatica*).

M24 purple moor-grass-meadow thistle fen-meadow is rare nationally but reasonably widespread. It tends to occur in localised patches amongst other marshy grassland communities and is usually markedly richer in species. Meadow thistle (*Cirsium dissectum*), a scarce species, is often present, with species such as purple moor-grass, devil's-bit scabious (*Succisa pratensis*), carnation sedge (*Carex panicea*), flea sedge (*C. pulicaris*) and tawny sedge (*C. hostiana*). Other species of interest may include whorled caraway (*Carum verticillatum*), globeflower (*Trollius europaeus*), petty-whin (*Genista anglica*) and marsh valerian (*Valeriana dioica*).

M25 purple moor grass-tormentil mire occurs on moist, peaty soils throughout the lowland and submontane areas of northern and western Britain. Its main characteristic is the dominance of purple moor-grass, but species-rich examples also include forbs such as tormentil (*Potentilla erecta*), saw-wort (*Serratula tinctoria*), lousewort (*Pedicularis sylvatica*), cross-leaved heath (*Erica tetralix*), bog asphodel (*Narthecium ossifragum*), meadowsweet, marsh thistle and wild angelica. Species poor examples, dominated by purple moor-grass and lacking any uncommon species should not generally be considered good candidates for selection as a Wildlife Site. However regard should be given to selection of M25 sites with less than 12 species present from Appendix 1, Table 6, but which contain particular indicators of 'quality' such as saw-wort, petty-whin, lousewort, meadow thistle or bog asphodel.

M27 meadowsweet-wild angelica mire occurs throughout lowland Britain on moist circum-neutral soils protected from grazing, especially at the margins of silted, slow-moving streams, pools, damp hollows and soakaways, as well as in artificial habitats such as dykes and roadside ditches. In addition to an abundance of meadowsweet, this community is often characterised by the presence of numerous other species such as common valerian (*Valeriana officinalis*), sorrel (*Rumex acetosa*), ragged robin and wild angelica, together with rushes (*Juncus* spp.) and purple moor-grass at low frequencies. Meadowsweet can also dominate long abandoned damp

pastures, but this form of M27 community, whilst still of interest, tends to be of relatively low vascular plant diversity.

**NVC Purple Moorgrass and Rush Pasture Communities and Associated habitat mosaics:**

| | |
|---|---|
| **M15** | *Scirpus cespitosus-Erica tetralix* wet heath |
| **M22** | *Juncus subnodulosus-Cirsium palustre* fen meadow |
| **M23** | *Juncus effusus/acutiflorus-Galium palustre* rush pasture |
| **M24** | *Molinia caerulea-Cirsium dissectum* fen-meadow |
| **M25** | *Molinia caerulea-Potentilla erecta* mire |
| **M27** | *Filipendula ulmaria-Angelica sylvestris* mire |
| **M28** | *Iris pseudacorus-Filipendula ulmaria* mire |

The conservation significance of these habitats has only been recognised comparatively recently. They are now recognised as being of Europe-wide significance, with the British Isles (Wales in particular) supporting a substantial proportion of the global resource.

Further useful information is available in Common Standards Monitoring Guidance for lowland grassland at http://www.jncc.gov.uk/PDF/CSM_lowland_grassland.pdf

The following should be considered for selection:

all examples of:

- blunt-flowered rush - marsh bedstraw fen meadow (M22)
- purple moor-grass - meadow thistle fen meadow (M24)
- meadowsweet - wild angelica mire (M27)

- all species-rich examples of other marsh and marshy grassland communities, including soft/sharp flowered rush - marsh bedstraw rush pasture (M23) and purple moor-grass - tormentil mire (M25)

A list of the vascular plant species indicative of species-rich communities in South Wales is given in Appendix 1, table 6 as an example, and in that region site is considered species-rich if 12 or more species from this table are recorded.

## H9:4) REEDBED

The UK is believed to support only 5000ha of reedbed, the great majority of which occurs in sites less than 20ha in size (UK Steering Group 1995). A wide range of NVC communities may occur in swamps, although the commonest is S4 common reed (*Phragmites australis*) swamp ('reedbed'). S12 bulrush (*Typha latifolia)*, S14 branched bur-reed (*Sparganium erectum*), S5 reed sweet-grass (*Glyceria maxima*), S10 water horsetail *(Equisetum fluviatile*) and S3 greater tussock-sedge (*Carex paniculata*) swamps are also moderately frequent.

**NVC Reedbed and swamp Communities:**

| | |
|---|---|
| **S3** | *Carex paniculata* sedge swamp |
| **S4** | *Phragmites australis* swamp and reed-beds |
| **S7** | *Carex acutiformis* swamp |
| **S9** | *Carex rostrata* swamp |
| **S10** | *Equisetum fluviatile* swamp |
| **S11** | *Carex vesicaria* swamp |
| **S12** | *Typha latifolia* swamp |
| **S14** | *Sparganium erectum* swamp |
| **S19** | *Eleocharis palustris* swamp |
| **S22** | *Glyceria fluitans* swamp |

| | |
|---|---|
| **S27** | *Carex rostrata - Potentilla palustris* fen |
| **S28** | *Phalaris arudinacea* fen |

Reedbeds and other swamps are particularly important for birds and invertebrates, the former including uncommon and declining nesting species such as reed warbler, reed bunting and water rail, and wintering species such as snipe and bittern. 'Secondary' swamps in disturbed locations often develop substantive conservation significance, for example in supporting key nesting birds, especially where they are of larger size.

The following should be considered for selection:

- all examples of reedbed and other tall swamps on undesignated sites

## H10) BOG

The Section 42 (WAG 2008) lists Bogs as a broad habitat category, within which lowland raised bog and blanket bog are identified as habitats of principle importance for conservation in Wales. Upland flushes fens and swamps are listed in the Fen, Marsh and Swamp broad category as an independent habitat type, instead including them within a broader and more complex system of mire classification

'Bog' is a generic term covering mire vegetation occurring on peat ≥0.5m deep, where the water level is at or just below the surface and is maintained principally by rainfall rather than by groundwater sources. The main vegetation component is usually bog moss (*Sphagnum* spp.), with members of the sedge family and sometimes with ericoid (heath family) species.

## H10:1) LOWLAND RAISED BOG

Lowland raised bog is a scarce habitat in Britain as a whole but appears to be present in a number of LBAP areas in Wales (see Appendix 3), although it can be difficult to differentiate this habitat from related types such as valley mire and basin mire fens.

| **NVC Raised bog Communities include:** | |
|---|---|
| **M1** | *Sphagnum auriculatum* bog pool community |
| **M2** | *Sphagnum cuspidatum/recurvum* bog pool community |
| **M18** | *Erica tetralix - Sphagnum papillosum* raised and blanket mire |
| **M20** | *Eriophorum vaginatum* blanket and raised mire |
| **M25*** | *Molinia caerulea - Potentilla erecta* mire |

Further useful information is available in Common Standards Monitoring Guidance for lowland wetland habitats at http://www.jncc.gov.uk/pdf/CSM_lowland_wetland.pdf

## H10:2 BLANKET BOG

Blanket bog is a globally restricted peatland habitat confined to cool, wet, typically oceanic climates. Peat depth is variable, with an average of 0.5-3 m being fairly typical but depths in excess of 5 m not unusual.

Blanket bog vegetation may contain substantial amounts of dwarf shrubs, but is distinguished from heathland by its occurrence on deep peat (>0.5 m) and usually contains frequent occurrence of hare's-tail cotton-grass *Eriophorum vaginatum* and characteristic mosses.

Many of the typical blanket mire species, such as heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, deer grass *Trichophorum cespitosum*, cotton grass *Eriophorum* species and several of the bog moss *Sphagnum* species, occur throughout much of the range of the habitat, although their relative proportions vary across the country.

The principal vegetation (NVC) types covered by this habitat are M1, M2, M3, M15, M17, M18, M19, M20 and M25, together with their intermediates. Other communities, such as flush, fen and swamp types, also form an integral part of the blanket bog landscape.

This plan encompasses all areas of blanket bog supporting semi-natural blanket bog vegetation, whether or not it may be defined as 'active'. It includes the EC Habitats Directive priority habitat 'active' blanket bog, the definition of active being given as 'still supporting a significant area of vegetation that is normally peat forming'.

Blanket-bog is locally extensive in the uplands and most undesignated examples are likely to be of value.

| **NVC Blanket bog Communities:** | |
|---|---|
| **M3** | *Eriophorum angustifolium* bog pool community |
| **M4** | *Carex rostrata - Sphagnum recurvum* mire |
| **M15*** | *Scirpus cespitosus-Erica tetralix* wet heath |
| **M17** | *Scirpus cespitosus – Eriophorum vaginatum* blanket bog |
| **M18** | *Erica tetralix – Sphagnum papillosum* raised and blanket mire |
| **M19** | *Calluna vulgaris - Eriophorum vaginatum* blanket bog |
| **M20** | *Eriophorum vaginatum* blanket and raised mire |

Further useful information is available in Common Standards Monitoring Guidance for lowland wetland habitats at http://www.jncc.gov.uk/pdf/CSM_lowland_wetland.pdf and upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

The following should be considered for selection:

- all undesignated examples of undesignated undegraded bog habitats, and degraded bog habitats which still show some remaining distinctive features of the habitat type

- individual neutral, basic or acid flushes of any size, providing they are not grossly modified by agricultural improvement

## H11) MONTANE HABITATS

The Montane Habitats broad category of the Section 42 list (WAG, 2007) identifies Mountain Heaths and Willow Scrub as a habitat of principle importance for conservation in Wales.

Further useful information is available in Common Standards Monitoring Guidance for upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

It is thought that the entire Welsh resource of this habitat type lies within designated site(s) in Snowdonia.

## H12) RIVERS AND STREAMS

### H12:1) Rivers

Under the broad category of 'Rivers and Streams', the Section 42 list (WAG, 2007) identifies Rivers as a habitat of principle importance for conservation in Wales. The SSSI selection criteria note that freshwater habitats encompass a wide range of habitats, which are often difficult to classify objectively, especially when considered at the UK-wide level.

'Good' aquatic, emergent or bankside communities is taken in this context to mean diverse semi-natural plant communities dominated by combinations of characteristic native species, and generally lacking dominance by exotic species.

It is recognised that all watercourses are likely to have been modified and/or polluted to some extent at some point, but the intention of selection should be to conserve systems where the majority is unmodified and/or unpolluted.

These guidelines give particular regard to the importance of the distinctive features of flowing watercourses, which still have a natural, dynamic pattern of fluviomorphology. Riffles and pools, meanders, eroding soft cliffs and exposed riverine sediments (gravel bars etc) are all examples of such features. There is often little or no vascular plant interest to such features, but they are good indicators of the physical naturalness of watercourses and the overall quality. Equally importantly, their features are of critical importance for the support of distinctive invertebrate communities. The invertebrate communities could be designated through development of detailed assemblages or individual species guidelines. However the difficulty of survey and identification of these specialist groups is such that it has been determined that blanket designation of natural watercourse features is the best way of furthering the conservation of these often overlooked habitat features and their dependant species.

Watercourses designated as Wildlife Sites should include 'buffer zones' of adjacent habitat up to 7m wide from either bank top although this may be narrower locally where the land alongside is developed or otherwise degraded by human activities. Adjacent semi-natural habitat directly associated with and adjacent to qualifying watecourses should also be included, even if the associated habitats do not merit designation as a Wildlife Site in their own right. This may include flood meadows, woodland, marsh and pollarded willows for example.

Reens (ditches) can provide a habitat that is often rich in rare or uncommon flora and fauna. The associated habitat, often arable or improved grassland should be included in a designation given the inseparable hydrological link between ditches and adjoining habitat, and the manner in which the adjoining land management can affect the physical conditions and vegetation height along ditches.

Freshwater habitats are difficult to conserve, being greatly subject to physical and chemical modification arising from artificial disturbance within their catchments. Land-use changes and human disturbance can provoke profound alterations in many aspects of riverine ecology, and is especially notable in rivers with lowland catchments (NCC 1989). Because of their linear nature, their importance as habitat corridors and their extensive influence, it is considered justifiable to use a blanket 'linear' designation for the selection of river and stream Wildlife Sites. This can be modified by professional judgement to ensure the protection of the widest range of riparian features and the fullest expression of habitat transitions and successions within the catchment. These linear Wildlife Sites should reflect the habitat continuity provided by the watercourse itself, whilst taking in adjacent habitats of high value which are linked to, or influenced by, the watercourse.

The Environment Agency *River Habitat Survey* method (EA 1996) provides a detailed survey methodology for watercourses and should ultimately provide a means for the assessment of habitat quality and evaluation against a national database.

Further useful information is available in Common Standards Monitoring Guidance for rivers at http://www.jncc.gov.uk/pdf/CSM_rivers_Mar05.pdf

The following should be considered for selection:

- all examples of undesignated stretches of main river where the river bed and banks remain comparatively unmodified and the water is not grossly polluted by long-term sources

- all examples of undesignated stretches of smaller watercourses (i.e. streams, canals, brooks etc.) which are comparatively unmodified, which support good aquatic, emergent or bankside plant communities, and the water is not grossly polluted by long-term sources

- all examples of sections of undesignated watercourses (regardless of scale) with exposed sediment and/or erosion features such as soft cliffs

- all examples of undesignated systems of reens and/or ditches with a diverse aquatic flora and/or fauna (including the associated habitat, e.g. field system on coastal levels or river floodplains).

Rivers are a new habitat priority on the Section 42 list and awaits a national definition and targets although further information is available in Anon (2007).

## H13) STANDING OPEN WATER AND CANALS

The Section 42 (WAG 2008) lists Standing Open Water as a broad habitat category, within which five habitat types are identified namely:

- Oligotrophic and Dystrophic Lakes
- Ponds
- Mesotrophic Lakes
- Eutrophic Standing Waters
- Aquifer fed Naturally Fluctuating Water Bodies

as habitats of principle importance for conservation in Wales.

Further useful information is available in Common Standards Monitoring Guidance to open waters at http://www.jncc.gov.uk/pdf/CSM_standingwaters_Mar05.pdf and Palmer, MA & Roy, DB (2001) and Duigan C.A., Kovach, W.L., Palmer, M. (2006)

## H13:1) OLIGROPHIC AND DYSTROPHIC LAKES

The following should be considered for selection:

- all examples of undesignated lakes which have largely unmodified, semi-natural beds and banks, good water quality and/or which support characteristic aquatic, emergent or bankside plant communities

Oligotrophic and Dystrophic Lakes are a new habitat priority on the Section 42 list and awaits a national definition and targets although further information is available in Anon (2007).

## H13:2 PONDS

A pond is defined as 'a body of standing water 0.0025 ha (25m²) to 2.0 ha in area which usually holds water for at least four months of the year' (Williams *et al*, 1998). The *National Pond Survey* (Pond Action, 1998) provides a methodology recommended for pond surveying.

In some cases there may be networks of small ponds which qualify individually on species-based guidelines, especially where these support the rare and protected great crested newt (see Species Guidelines S4). In order to allow for natural migration by this and other species of note both between ponds (e.g. during the breeding period) and into terrestrial habitats around ponds (e.g. during the late summer period and winter hibernation period), it may also be necessary for the Wildlife Site to include linking terrestrial habitat corridors.

The following should be considered for selection:

- all examples of ponds which score 'High' or 'Very High' when assessed using methodology set out in the *National Pond Survey* (Pond Action 1998)

Ponds are a new habitat priority on the Section 42 list and awaits a national definition and targets although further information is available in Anon (2007).

## H13:3) MESOTROPHIC LAKES

The following should be considered for selection:

- all examples of lakes and ponds which have largely unmodified, semi-natural beds and banks, good water quality and/or which support good aquatic, emergent or bankside plant communities

## H13:4) EUTROPHIC STANDING WATERS

'Good' aquatic, emergent or bankside communities is taken in this context to mean diverse semi-natural plant communities dominated by combinations of characteristic native species, and generally lacking dominance by coarse grasses, ruderal (i.e. wasteground) and exotic species.

Consideration should be given to the inclusion of an appropriate area of terrestrial habitat around any selected ponds and lakes, which should be sufficient to protect the waterbody from incidental pollution or disturbance. This 'buffer zone' should typically be a minimum of 10m wide from the water's edge.

The following should be considered for selection:

- all examples of lakes and ponds which have largely unmodified, semi-natural beds and banks, good water quality and/or which support good aquatic, emergent or bankside plant communities

## H13:5) AQUIFER FED NATURALLY FLUCTUATING WATER BODIES

There is only one known Aquifer fed Naturally Fluctuating Water Body in Wales which is situated within a designated SSSI in Carmarthenshire.

## H14) INLAND ROCK

The Section 42 List (WAG 2008) identifies the following four habitat types as habitats of principle importance for conservation in Wales:

- Inland Rock Outcrop and scree habitats
- Calaminarian Grasslands
- Open Mosaic Habitats on Previous Developed Land
- Limestone Pavements

## H14:1 INLAND ROCK OUTCROP AND SCREE HABITATS

Rock exposures are a particular feature of the uplands, but also occur locally in lowland situations. There should be a general preference for the selection of semi-natural rock exposures and screes, but care should be taken to ensure that the test of 'substantive nature conservation interest' is met. The presence of species of interest may allow selection under the Species Guidelines, particularly with reference to Lichens (S7) and Bryophytes (S8) of conservation concern. In many cases, these features are likely to fall within mosaics of other surrounding habitats that also qualify for selection.

**National Vegetation Classification [NVC] communities occurring in Inland Rock Outcrop and Scree Habitats in Wales:**

| | |
|---|---|
| **CG7** | *Festuca ovina-Hieracium pilosella-Thymus praecox* grassland; |
| **CG10** | *Festuca ovina-Agrostis capillaris-Thymus praecox* grassland; |
| **U16** | *Luzula sylvatica-Vaccinium myrtillus* tall herb community; |
| **U17**** | *Luzula sylvatica-Geum rivale* tall herb community; |
| **U19** | *Thelypteris limbosperma-Blechnum spicans* community; |
| **U21** | *Cryptogramma crispa-Deschampsia flexuosa* community; |
| **OV38**** | *Arrhenatherum elatius-Gymnocarpium robertianum* community; |
| **OV39** | *Asplenium trichomanes-A. ruta-muraria* community; |
| **OV40**** | *Asplenium viride-Cystopteris fragilis* community |

** Rare communities in Wales (Marcus Yeo, personal communication).

Further useful information is available in Common Standards Monitoring Guidance for upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

The following should be considered for selection:

- Undesignated areas/exposures considered to be S42 Habitat
- Undesignated areas /exposures that hold populations of S42 species
- All undesignated natural or man made caves used as a roost for bats.
- All undesignated exposures evidently used as nesting sites of bird species of conservation concern.

Inland Rock Outcrop and Scree Habitats are a new habitat priority on the Section 42 list and awaits a national definition and targets although further information is available in Anon (2007).

## H14:2) CALAMINARIAN GRASSLANDS

Further useful information is available in Common Standards Monitoring Guidance for lowland wetland habitats at http://www.jncc.gov.uk/PDF/CSM_lowland_grassland.pdf and upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

Calaminarian Grasslands are a new habitat priority on the Section 42 list and awaits a national definition and targets although further information is available in Anon (2007).

## H14:3) OPEN MOSAIC HABITATS ON PREVIOUSLY DEVELOPED LAND

Unusual assemblages of plant species of interest can occur on post-industrial land. Such sites with a high diversity of native and archaeophyte species can be selected as Wildlife Sites, even if a significant habitat mosaic is absent and the habitat present does not merit selection as a 'secondary' example of any of the semi-natural habitats for which there are other habitat

guidelines. It is considered that substantive nature conservation value can be demonstrated, and thus the site is eligible for Wildlife Site selection, if 20 or more plant species from the combined lists of grassland species (Tables 3-5) and the following list of characteristic (but not ubiquitous) additional species in Table 7 are present.

A diverse range of post-industrial sites are found throughout Wales, with areas of colliery spoil, slag and old quarries being common in the coalfield, and a range of derelict land and demolition sites occurring in and around towns and cities. Other post-industrial sites (in the broadest sense) include disused railway lines, cuttings, rubbish dumps, docks, embankments and sea defences.

The varied, often mixed soil types, and the frequent occurrence of varied topography and extremes of drainage all promote high floral and faunal diversity on such sites. Past and/or ongoing ground disturbance, and substrate instability, or infertility often leads to patchy or extensive areas of largely bare ground, which can be a positive feature for annual and specialist colonisers, and fauna such as grayling (*Hipparchia semele*) and emerald tiger-beetle (*Cicindela campestris*). Extensive areas of largely bare ground can be important for breeding birds such as lapwing (*Vanellus vanellus*) and little ringed plover (*Charadrius dubius*), whilst sites with varied vegetation structure with bare ground, herbaceous vegetation and scrub in close proximity, are often valuable for reptiles and scarce or rare invertebrates.

Many post-industrial sites will qualify as Wildlife Sites as a result of vegetation developing which has a similar floristic composition to semi-natural habitats of value. Grasslands, heaths, wetland and scrub vegetation of Wildlife Site quality are all frequent on post-industrial land. Furthermore, many post-industrial land sites have a range of habitats present, such that the site is suitable for selection as a Wildlife Site on the basis of its mosaic of habitats (H16), even if none of the habitat elements are of Wildlife Site quality in their own right.

The following should be considered for selection:

- all examples of post-industrial land that has re-vegetated with a diverse range of native and archaeophyte non-woody plant species

Open mosaics habitats on previously developed land is a new habitat priority on the Section 42 list and awaits a national definition and targets although further information is available in Anon (2007).

## H14:4) LIMESTONE PAVEMENTS

The habitat is widely scattered in Britain and occurs on Carboniferous limestone in Wales. The UK holds a significant proportion of the resource of this habitat within the European Union. Limestone pavements are of both geological and biological importance. The vegetation is rich in vascular plants, bryophytes and lichens and varies according to geographical location, altitude, rock type and the presence or absence of grazing animals.

Limestone pavement vegetation may also contain unusual combinations of plants, with woodland and wood-edge species well-represented in the sheltered grikes. The clints support plants of rocky habitats or are often unvegetated. In the absence of grazing, scrub may develop. In oceanic areas, scrub over limestone pavement is important for epiphytes.

Areas of pavement may be associated with exposed limestone faces which are not considered to be pavement, or scree and boulder fields of eroded material. The area immediately around limestone pavement is often calcareous grassland and small outcrops of pavement may form a mosaic within difference calcareous communities of both grassland and scrub.

Wildlife sites should seek to included these other areas of S42 habitat within the site boundaries.

Further useful information is available in Common Standards Monitoring Guidance for upland habitats at http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

The following should be considered for selection:

- all occurrences of undesignated limestone pavement, especially where supporting a rich gryke flora (i.e. mixtures of species characteristic of calcareous woodlands and grasslands living within the cracks and furrows)

## H15) COASTAL HABITATS

The Section 42 List (WAG 2008) identifies the following three habitat types within two categories as habitats of principle importance for conservation in Wales:

**Supralittoral Rock**

- Maritime cliffs & slopes

**Supralittoral Sediment**

- Coastal sand-dunes
- Coastal vegetated shingle

## H15:1 MARITIME CLIFFS AND SLOPES

'Unmodified' cliffs and slopes are those which have not been artificially clad, shored-up or developed, and which support semi-natural habitats typical of, and native to, the location. Soft cliffs are particularly overlooked for their invertebrate interest, which can occur without associated vegetation interest.

Further useful information is available in Common Standards Monitoring Guidance for coastal cliff and slope at http://www.jncc.gov.uk/pdf/CSM_coastal_cliff_slope.pdf

The following should be considered for selection:

- all examples of undesignated unmodified semi-natural coastal cliff, together with associated crags, ledges, seepages, grassland and scrub habitats

## H15:2 COASTAL SAND-DUNE

Further useful information is available in Common Standards Monitoring Guidance for coastal sand dune at http://www.jncc.gov.uk/pdf/CSM_coastal_sand_dune.pdf

The following should be considered for selection:

- all examples of undesignated sand dune, together with associated slacks, seepages, grassland and scrub habitat

## H15:3 COASTAL VEGETATED SHINGLE

Further useful information is available in Common Standards Monitoring Guidance for coastal shingle at http://www.jncc.gov.uk/pdf/CSM_coastal_shingle.pdf

The following should be considered for selection:

- examples of undesignated coastal vegetated shingle.

## H16) MOSAIC HABITATS

Mosaic sites, comprising of complex mixtures of semi-natural habitats, are acknowledged to be problematic when determining criteria for Wildlife Site selection, especially where none of the habitats involved are capable of qualifying individually for selection ('non-qualifying mosaics'). Such sites may not contain any habitats that are intrinsically of very high interest, but may nevertheless be extremely important for the range of species they support collectively. Fauna may depend on a number of the habitat elements present for differing purposes, not being solely reliant on any one habitat element.

It is unrealistic to design a firm criterion for the selection of such sites because of the potential variety of habitats and features that could be involved. The difficulties implicit with mosaic sites mean that expert judgement is likely to be required in individual cases.

However, the following should be considered for selection:

- Any coherent site which has represented at least three distinct habitat types where at least one is approaching Wildlife Site selection status in its own right, providing that improved, species-poor or degraded elements of low or negligible conservation interest do not form a significant proportion (>25%) of the total site area.

- The 'block designation' of extensive areas of open countryside where semi-natural upland features predominate.

Parks, gardens burial grounds and golf courses can support mosaics of comparatively undisturbed habitats, including semi-natural grasslands, large trees, small woodlands and scrub, lakes and ponds etc. Many wetlands may also qualify as mosaic sites, their importance lying in the continuity and interdependence of the habitats represented, rather than on the individual significance of key habitats or species.

The present state of survey information for uplands is significantly less detailed than for the lowlands. As a general rule it is desirable to aggregate individually qualifying habitats together into single sites where the habitats are adjacent and/or intimately associated. Where smaller sites, or extensively degraded sites, are considered as mosaic sites, care should be taken to ensure that a defensible and reasoned justification is given. Otherwise there may be a risk that the required test of 'substantive nature conservation interest' will not be met, and the site could successfully be challenged.

## H16:1) FRIDD/COEDCAE

The Ffridd zone is difficult to define in terms of a single vegetation community as its primary characteristic is of a collection of various habitats. It can perhaps be best described as the mosaic of fragmented and diverse habitats found at the interface of upland and lowland habitats. It is almost exclusively found on slopes, particularly those areas that cannot be effectively farmed due to steepness or the frequency of rock outcrops and scree. Ffridd may also develop on previous areas of conifer plantation which has yet to be re-planted.

It is most often a mixture of grass and heathland types with bracken, scrub (often hawthorn and gorse) or rock exposures and may also include flushes, mires, streams and standing water.

It is a group of semi-natural habitats and can be noted for its dynamic nature as the Ffridd zone has a long history of changing cycles of management. Ffridd will often display successional stages in the development of woodland from grass/heathland habitats.

The boundaries of Ffridd are also very difficult to define and it will often grade gently into more clearly defined upland mosaics above and lowland pastures and woodland below.

The variety of vegetation, communities and structural features make this a habitat of high diversity. While not only capable of supporting numerous species, this ffridd zone has been identified as a habitat of high connectivity in that it can facilitate the movement of numerous species. This value should not be underestimated and the ffridd is a vital component of the landscape providing species with the ability to make vertical movements as they seek a more suitable future climate space.

Given this value for connectivity and the difficulties in defining the boundaries of the Ffridd zone, Wildlife Sites should seek to include adjacent habitat where a clear boundary such as a fence line can be used to set a definite boundary.

## H16:2) OTHER BRACKEN COMMUNITIES

The UKBAP makes only passing reference to bracken communities, and does not identify any priorities for conservation. As indicated above, that assessment ignores the ground flora, and wider faunal interest that bracken stands can have.

Stands of bracken which do not have a very dense, deep litter layer beneath the fern canopy can support a shade-tolerant ground flora which includes species such as common dog-violet (*Viola riviniana*), bluebell (*Hyacinthoides non-scripta*), climbing corydalis *(Ceratocapnos claviculata),* wood anemone (*Anemone nemorosa*), lesser celandine (*Ranunculus ficaria*) and wood sorrel (*Oxalis acetosella)*. These areas are not only of botanical interest, they may also provide habitat for rare, specialist invertebrates such as the high-brown fritillary (*Argynnis adippe*) and other fritillary butterflies. Particular regard should also be given to native populations of daffodil (*Narcissus pseudonarcissus).*

Bracken (*Pteridium aquilinum*) is a widespread and invasive fern species formerly kept in check by traditional grazing and land management methods. With cessation of this management in recent decades, bracken has begun to spread over very extensive areas of both the uplands and lowlands where soil conditions are suitable (typically free-draining and non-calcareous) often at the expense of other, more valuable habitats such as heathland or semi-improved grassland.

In the absence of associated species of interest, most examples of bracken cover would not qualify for Wildlife Site selection, although they may form part of a mosaic with other qualifying habitats. Where bracken occurs amongst scattered trees and shrubs, it may also support distinctive communities of nesting birds such as tree pipit, whinchat, wheatear, yellowhammer and cuckoo, several of which are nationally in decline and of conservation interest. Such areas may qualify as Wildlife Sites under the Species Guidelines.

The following should be considered for selection:

- stands of bracken with a species-rich ground flora

## MARINE HABITATS

'Undegraded' coastal and littoral habitats refer to those that have not been developed or extensively disturbed by human activities, and which are not subject to significant long-term pollution from onshore sources. Coastal and littoral habitats refers to all habitats between the cliff foot (and where there is no cliff, the Mean High Water Mark) and the Mean Low Water Mark. Habitats below the Mean Low Water Mark are excluded from these guidelines pending further consideration

- examples of degraded or modified coastal habitat which still supports significant semi-natural vegetation communities

Marine habitats may be considered out of the scope of LBAP boundaries, however this is not the case, for example in partnerships such as those involving Coastal Zone Management, and consortia of neighbouring LBAP partnerships.

All examples of undesignated Marine Habitats as identified in the Section 42 list as being of principle importance for conservation in Wales (WAG, 2008) should be considered for selection were appropriate, as below.

## H17) LITTORAL ROCK

H17:1) INTERTIDAL BOULDER COMMUNITIES

H17:2) *SABELLARIA ALVEOLATA* REEFS

H17:3) ESTUARINE ROCKY HABITATS

## H18) LITTORAL SEDIMENT

### H18:1) COASTAL SALTMARSH

Further useful information is available in Common Standards Monitoring Guidance for coastal saltmarsh at http://www.jncc.gov.uk/pdf/CSM_coastal_saltmarsh.pdf

The following should be considered for selection:

- examples of undesignated coastal saltmarsh.

### H18:2) INTERTIDAL MUDFLATS

H18:3) SEA GRASS BEDS

H18:4) SHELTERED MUDDY GRAVELS

H18:5) PEAT AND CLAY EXPOSURES

## H19) SUBLITTORAL ROCK

H19:1) TIDE-SWEPT CHANNELS

H19:2) FRAGILE SPONGE AND ANTHOZOAN COMMUNITIES ON SUBTIDAL ROCKY HABITATS

H19:3) CARBONATE REEFS

## H20) SUBLITTORAL SEDIMENTS

H20:1) SUBTIDAL SANDS AND GRAVELS

H20:2) SUBLITTORAL MIXED MUDDY SEDIMENTS

H20:3) MUD HABITATS IN DEEP WATER

H20:4) MUSCULUS DISCORS BEDS, GREEN CRENELLA BEDS

H20:5) BLUE MUSSEL BEDS

H20:6) HORSE MUSSEL BEDS

H20:7) MAERL BEDS

## H20:8) SALINE LAGOONS

Further useful information is available in Common Standards Monitoring Guidance for marine lagoons at http://www.jncc.gov.uk/PDF/CSM_marine_lagoons.pdf

The following should be considered for selection:

- all examples of undesignated saline lagoons

# SPECIES GUIDELINES

The species guidelines have been laid out in the order of the Section 42 list (WAG, 2008)

S1: Mammals
S2: Birds
S3: Herptiles (Reptiles and Amphibians)
S4: Fish
S5: Invertebrates
S6: Vascular Plants
S7: Lichens
S8: Bryophytes (Mosses Liverworts and Hornworts)
S9: Fungi
S10: Charophytes

Within each taxa an attempt has been made to provide information on those species listed under conservation status, legal status, and occurrence in Wales by hectad number (10 kilometre squares) with associated date range of recording.

Species Conservation Status
At present conservation specialists use different criteria to measure conservation status across taxa. There have been GB conservation status criteria based upon distribution exemplified in the published taxa Red Data books augmented by pre and post 1994 IUCN criteria [www.iucn.org ]. The conservation status listed in this document come from the latest JNCC conservation status list available at http://www.jncc.gov.uk/page-3409 , dated 17th December 2007, and all the acronyms are explained in the Glossary of Terms and Abbreviations.

Species Distribution in Wales
An attempt has been made to indicate the "known" occurrence of most species listed in these guidelines using hectad number. In many cases, this data has been obtained from the NBN Gateway, http://www.searchnbn.net/index_homepage/index.jsp which also has the facility to interrogate datasets by LBAP area under the distribution of species on protected sites menu.

Due to the dynamic nature of species populations, the date range of recording is included with each hectad number, and in some cases the distribution may have changed in the interim.

More detailed information for a local area should be obtained from local specialists and recorders via the local records centre, www.lrcwales.org.uk.

## S1) MAMMALS

Those species in **bold** are afforded 'European Protected Species' status through the European Habitats Directive (1992) implemented in UK law by The Conservation (Natural Habitats) Regulations 1994 as amended.

### Mammals (excluding Bats)

The following should be considered for selection:-

- any sites supporting breeding (or probable breeding) species (other than bats) which are listed as fully or partially protected on Schedule 5 of the Wildlife & Countryside Act 1981, together with any areas which are critical for nesting, foraging, roosting (laying

up), territorial or other significant use, where this has been determined by survey. These species currently comprise:

water vole (*Arvicola terrestris*)
**otter (*Lutra lutra*)**
pine marten (*Martes martes*)
**dormouse (*Muscardinus avellanarius*)**
red squirrel (*Sciurus vulgaris*)

- any sites supporting established breeding populations of the following species which are nationally declining, regionally important or S42/Local BAP Priority Species, together with any areas which are critical for nesting, foraging, territorial or other significant use, where this has been determined by survey provided they are not the result of recent deliberate introductions which do not form part of a recognised species recovery programme. These species comprise:

  brown hare (*Lepus europaeus*)
  harvest mouse (*Micromys minutus*)
  polecat (*Mustela putorius)*
  water shrew (*Neomys fodiens*)
  yellow-necked mouse (*Apodemus flavicollis*)

The presence of breeding badgers (*Meles meles*) is not, in itself, considered a valid reason for site selection. However, the presence of badger setts should be considered to be an additional, supporting reason for the selection of sites which also qualify under other guidelines i.e. on habitat grounds or for species other than badger. Legal protection is given to both badgers and their setts on welfare grounds (The Protection of Badgers Act 1992).

## Bats

The following should be considered for selection for a local site designation:-

- any undesignated significant roosting sites, vital flight and commuting routes and priority feeding areas attached to roosts. Also included should be any structures as tunnels, icehouses, basements, gunnery emplacements, pill boxes etc which are used as roosts

'Roosts' include maternity, pre/post-maternity, hibernation, mating and male roosts. 'Significant' will have a varying numerical value dependant on species. Significance levels are given in Table 1 below and vary for each species and roost type. Of particular importance are sites of multi-species occupancy and feeding sites targeted by several species.

- also for consideration are any significant winter roosting sites (hibernation roosts) of any of the species found in Table 1 below.

Table 1 **Significance levels for bats**

| **Species:** ** (S42 Priority species) * (Species of conservation concern) + Wales only S42 species | | **Maternity Roost** | **Other roost types e.g. hibernation** | **Known to breed in Wales** |
|---|---|---|---|---|
| **Barbastelle** (*Barbastella barbastellus)* | ** | Any | Any | Y |
| **Bechstein's bat** (*Myotis bechsteinii*) | ** | Any | Any | |
| **Brandt's bat** (*Myotis brandti*) | * | 10 | 5 | Y |
| **Brown long-eared bbat** (*Plecotus auritus*) | ** | 25 | 5 | Y |
| **+Common pipistrelle** (*Pipistrellus pipistrellus*) | ** | 50 | 5 | Y |
| **Daubenton's bat** (Myotis daubentoni) | * | Any | Any | Y |
| **Gt. horseshoe** (*Rhinolophus ferrumequinum*) | ** | Any | Any | Y |
| **Leislers** (*Nyctalus leisleri)* | * | Any | Any | |
| **Lesser horseshoe** *(Rhinolophus hipposideros)* | ** | Any | Any | Y |
| **Nathusius' pipistrelle** (*Pipistrellus nathusii*) | * | Any | Any | Y |
| **Natterer's bat** (*Myotis nattereri*) | * | 10 | 5 | Y |
| **Noctule** (*Nyctalus noctula*) | ** | Any | Any | Y |
| **Serotine** (*Eptesicus serotinus*) | * | Any | Any | Y |
| **Soprano pipistrelle** (*Pipistrellus pygmaeus*) | ** | 120 | 5 | Y |
| **Whiskered bat** (*Myotis mystacinus*) | * | 10 | 5 | Y |

Further information can be found on common standards monitoring of mammals, at www.jncc.gov.uk/pdf/CSM_mammals.pdf with particularly reference to otter, water vole and bat species, with species accounts for bats available in Altringham, J.D. (2003), and species accounts for all British mammals in Harris, S. and Yalden, D.W. (2008).

## S2) BIRDS

Tables 2& 3 below set out an assessment of those bird species, which are considered to be of conservation significance within South Wales. Two lists have been created for Gwent, Glamorgan and Carmarthenshire, namely "Breeding Birds of Conservation Significance in" and "Wintering and Passage Birds of Conservation Significance. This exercise can be undertaken for any local authority/LBAP area in association with the local bird recorder/bird recording group and any local specialists.

Selection was based on each species' status within the region using: 'Red' or 'Amber' listing, JNCC (20071217); the Section 42 List (WAG, 2008), or listed on schedules of the Wildlife & Countryside Act 1981 (& amendments).

The value of the 'contributory species' in each of the lists is that they might tip the balance in favour of a site that is borderline in respect of other factors such as habitat. It is considered that for the presence of an assemblage of 'contributory species' to be a justification for Wildlife Site designation in its own right, there should be a minimum of at least 8-10 species in summer depending on habitat (wetland, woodland and/or grassland), and 12 species in winter/on passage. The precise details of numbers, and any additional species, should be agreed at LBAP partnership level. A 'species diversity' element is also included in these guidelines.

Further information can be found on common standards monitoring of birds at http://www.jncc.gov.uk/pdf/CSM_birds_incadditionalinfo.pdf

On this basis the following should be considered for selection;

- sites supporting breeding populations, of any size, of species marked with an A in Table 2

- sites supporting wintering or passage refuelling populations, of any size, of species marked with an A in Table 3

- sites supporting a predetermined number (to be agreed by the LBAP partnerships) of those species that are marked with a B in Tables 2 & 3, or identified as additions to the tables by the LBAP partnership, that collectively designate a site and/or contribute towards its designation

- any site with 100 or more bird species recorded in the previous five years

***Context***

Govermental and non-governmental conservation organisations in Wales have reviewed the population status of the birds that are regularly found here. A total of 221 species have been assessed and each placed onto one of three lists – red, amber or green. 27 species are red-listed, 69 are amber-listed and 125 are green-listed (Thorpe & Young 2003).

This list was published in 2003 and is the first time that a list specific to Wales has been produced. It will be reviewed every five years to keep track of changes in abundance and range. It is based on the criteria developed for the UK publication, *The Population Status of Birds in the UK – An analysis of Conservation Concern: 2002-2007* (Gregory *et al* 2002), but are adjusted to reflect the specifics of Wales, principally its size.

The principal information used in the list is from:

- Information on the global and European conservation status of UK bird species from BirdLife International's *Threatened Birds of the World* (2000) and *Birds in Europe* (Tucker *et al* 1994)

- Information on trends in breeding populations and range sizes from the BTO/JNCC Common Birds Census and Waterways Bird Survey; the BTO/JNCC/RSPB Breeding Bird Survey: the JNCC/RSPB/SOTEAG seabird monitoring programme and Seabird 2000; the Rare Breeding Birds Panel; single-species surveys, mostly undertaken as part of the SCARABBS agreement; and the BTO/SOC/IWC *New Atlas of Breeding Birds*

- Information on trends in breeding populations and range sizes from the BTO/JNCC Common Birds Census and Waterways Bird Survey; the BTO/JNCC/RSPB Breeding Bird Survey: the JNCC/RSPB/SOTEAG seabird monitoring programme and Seabird 2000; the Rare Breeding Birds Panel; single-species surveys, mostly undertaken as part of the SCARABBS agreement; and the BTO/SOC/IWC *New Atlas of Breeding Birds*

- Information on population trends in non-breeding birds from the BTO/WWT/RSPB/JNCC Wetland Bird Survey and WWT/JNCC goose counts

- Information on species' distributions from BirdLife's *Important Bird Areas in Europe* and the JNCC's *The UK SPA Network*

- Information on population sizes in the UK and Europe from the Avian Population Estimates Panel and BirdLife/EBCC's *European Bird Population Estimates and Trends*
- Specific survey information on species in Wales

## The Criteria

Seven quantitative criteria were used to assess the population status of each species and place it onto the red, amber or green list. These criteria are briefly explained below. They cover the UK, the Channel Islands and the Isle of Man and exclude species that are not native to the UK and those that occur irregularly as vagrants or scarce migrants.

- **Global Conservation Status**
  Species assessed as Globally Threatened using IUCN criteria were placed on the red list. Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.
- **Recent Decline**
  Species whose breeding or non-breeding population declined, or range contracted, rapidly (by more than 50%) or moderately (by between 25 and 49%) over the last 25 years were placed on the red and amber lists respectively. Amber list species are those with an unfavourable conservation status in Europe, those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.
- **Historical Decline**
  Species whose populations declined severely between 1800 and 1995 were placed on the red list, except for those that have recovered substantially (more than doubled) in the last 25 years, which were amber-listed. However, globally threatened species and those with populations of fewer than 100 breeding pairs in the UK remain red-listed. In earlier assessments, all species showing a serious historical decline were red-listed, but in this assessment the success of recent conservation action has been recognised by moving recovering species to the amber list.
- **European Conservation Status**
  Species whose population status is unfavourable in Europe (but which are not Globally Threatened) were placed on the amber list.
- **Rare Breeders**
  Species with a mean population size of 1-30 pairs breeding annually over the last five years were placed on the amber list. If a full census was carried out in a single year, the result of this was used instead of a five-year mean.
- **Localised Species**
  Species for which 50% or more of the breeding or non-breeding population occurs at one site were placed on the amber list. This criterion was used because a species whose population is confined to a few sites faces a greater threat from chance events than one whose population is widespread. The sites considered were either Important Bird Areas (identified by BirdLife International) or Special Protection Areas (designated under the European Union's Directive on the Conservation of Wild Birds).

- **International Importance**
  Species with 2% or more of their European population breeding in the UK were placed on the amber list, as were non-breeding wildfowl with 2% or more of their northwest European population occurring in the UK, and non-breeding waders with 2% or more of their East Atlantic Flyway population occurring in the UK. This criterion is different from the others, as it is a measure of the UK's responsibility for each species rather than the extent to which species are threatened.
- **Green Listing**
  Species that fulfil none of the above criteria are green listed.

Table 2 **Breeding Birds of Conservation Significance in Gwent, Glamorgan and Carmarthenshire** (after JNCC (20071217)[1]; Wales Assembly Government (2008)[2]; and Gregory R.D et al (2002)[3]).

| **SPECIES**<br>+ Wales only S42 species | **W&CA Sch. 1[1]** | **Conservation Status[1] Red/Amber** | **Section 42[2]** | **Local Status[3]**<br>**A** = Designates<br>**B** = Contributes |
|---|---|---|---|---|
| Avocet | X | Amber | - | A |
| **Bunting, Corn** | - | Red | X | A |
| Buzzard, Honey | X | Amber | - | A |
| **+ Chough** | X | Amber | X | A |
| Cormorant, Great | - | Amber | - | A |
| **Cuckoo, Common** | - | Amber | X | A |
| **Curlew, Eurasian** | - | Amber | X | A |
| **Dove, Turtle** | - | Red | X | A |
| Egret, Little | - | Amber | - | A |
| Falcon, Peregrine | X | Amber | - | A |
| Firecrest | X | Amber | - | A |
| Gadwall | - | Amber | - | A |
| Garganey | X | Amber | - | A |
| **Grouse, Red** | - | Amber | X | A |
| **+ Gull, Black-headed** | - | Amber | X | A |
| Gull, Great Black-backed | - | - | - | A |
| **+ Harrier, Hen** | X | Red | X | A |
| **Hawfinch** | - | Amber | X | A |
| Hobby | X | - | - | A |
| **+ Kestrel** | - | Amber | X | A |
| Kite, Red | X | Amber | - | A |
| Kittiwake | - | Amber | - | A |
| **Lapwing** | - | Amber | X | A |
| Merlin | X | Amber | - | A |
| **Nightjar, European** | - | Red | X | A |
| **Ouzel, Ring** | - | Red | X | A |
| Owl, Long-eared | - | - | - | A |
| Owl, Short-eared | - | Amber | - | A |
| **Partridge, Grey** | - | Red | X | A |
| **Pipit, Tree** | - | Amber | X | A |
| **+ Plover, Golden** | - | - | X | A |
| Plover, Little-ringed | X | - | - | A |
| + Plover, Ringed | - | Amber | X | A |
| Rail, Water | - | Amber | - | A |
| Redshank | - | Amber | - | A |
| Shelduck | - | Amber | - | A |
| Shoveler | - | Amber | - | A |
| Snipe, Common | - | Amber | - | A |
| **Sparrow, Tree** | - | Red | X | A |
| Teal, Eurasian | - | Amber | - | A |
| **Tit, Marsh** | - | Red | X | A |
| **Tit, Willow** | - | Red | X | A |
| **Wagtail, Yellow** | - | Amber | X | A |
| Warbler, Cetti's | X | - | - | A |
| Warbler, Dartford | X | Amber | - | A |
| **Warbler, Wood** | - | Amber | X | A |
| **Woodpecker, Lesser-spotted** | - | Red | X | A |
| **Yellowhammer** | - | Red | X | A |
| | | | | |

| | | | | |
|---|---|---|---|---|
| **Bullfinch** | - | Red | X | B |
| **Bunting, Reed** | - | Red | X | B |
| Crossbill, Common | X | - | - | B |
| Dove, Stock | - | Amber | - | B |
| **+ Flycatcher, Pied** | - | - | X | B |
| **Flycatcher, Spotted** | - | Red | X | B |
| Goshawk | X | - | | B |
| **Gull, Herring** | - | Amber | X | B |
| Gull, Lesser black-backed | - | - | - | B |
| Kingfisher | X | Amber | - | B |
| **Linnet, Common** | - | Red | X | B |
| Martin, Sand | - | Amber | - | B |
| Owl, Barn | X | Amber | - | B |
| Oystercatcher | - | Amber | - | B |
| Pintail | - | Amber | - | B |
| Redstart | - | Amber | - | B |
| **Skylark** | - | Red | X | B |
| **Sparrow, House** | - | Red | X | B |
| **Starling** | - | Red | X | B |
| Stonechat | - | Amber | - | B |
| **Thrush, Song** | - | Red | X | B |
| **Warbler, Grasshopper** | - | Red | X | B |
| Woodcock | - | Amber | - | B |
| Woodpecker, Green | - | Amber | - | B |

W&CA1 : Wildlife & Countryside Act 1981, Sch 1

Red Status : Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.

Amber Status : Amber list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.

Sec 42 : Section 42 List of 'Species and Habitats of Principle Importance for the Conservation of Biodiversity in Wales'

Table 3 **Wintering and Passage Birds of Conservation in Gwent, Glamorgan and Carmarthenshire**(after JNCC (20071217)[1]; Wales Assembly Government (2008)[2]; and Gregory R.D et al (2002)[3]).

| **SPECIES**<br>+ Wales only S42 species | **W&CA Sch. 1[1]** | **Conservation Status[1] Red/Amber** | **Section 42[2]** | **Local Status[3]**<br>**A** = Designates<br>**B** = Contributes |
|---|---|---|---|---|
| Avocet | X | Amber | - | A |
| **Bittern, Great** | X | Red | X | A |
| **Bunting, Corn** | - | Red | X | A |
| **+ Chough** | X | Amber | X | A |
| Dotterel | X | Amber | - | A |
| **Dove, Turtle** | - | Red | X | A |
| Egret, Little | - | Amber | - | A |
| **Grouse, Red** | - | Amber | X | A |
| Harrier, Marsh | X | Amber | - | A |
| **+ Harrier, Hen** | X | Red | X | A |
| Owl, Long-eared | - | - | - | A |
| Owl, Short-eared | - | Amber | - | A |
| **Partridge, Grey** | - | Red | X | A |
| Rail, Water | - | Amber | - | A |
| **Sparrow, Tree** | - | Red | X | A |
| **Swan, Bewick's** | - | Amber | X | A |
| Tern, Little | - | Amber | - | A |
| Tit, Bearded | X | Amber | - | A |
| **Warbler, Aquatic** | - | Red | X | A |
| Warbler, Cetti's | X | - | - | A |
| Warbler, Dartford | X | Amber | - | A |
| | | | | |
| **Bullfinch** | - | Red | X | B |
| **Bunting, Reed** | - | Red | X | B |
| Cormorant, Great (roosts) | - | Amber | - | B |
| **Curlew, Eurasian** | - | Amber | X | B |
| Diver, Red-throated | - | Amber | - | B |
| Dove, Stock | - | Amber | - | B |
| Dunlin | - | Amber | - | B |
| Falcon, Peregrine | X | Amber | - | B |
| Firecrest | X | Amber | - | B |
| Gadwall | - | Amber | - | B |
| **+ Godwit, Bar-tailed** | - | Amber | X | B |
| Godwit, Black-tailed | - | Red | - | B |
| **Goose, Dark Bellied Brent** | X | Amber | X | B |
| **Goose, White-fronted** | - | Amber | X | B |
| Gull, Great Black-backed | - | - | - | B |
| **+ Kestrel** | - | Amber | X | B |
| Kingfisher | X | Amber | - | B |
| Knot | - | Amber | - | B |
| **Lapwing** | - | Amber | X | B |
| **Linnet, Common** | - | Red | X | B |
| Merlin | X | Amber | - | B |
| Owl, Barn | X | Amber | - | B |
| Oystercatcher | - | Amber | - | B |
| Pintail | - | Amber | - | B |
| **+ Plover, Golden** | - | - | X | B |
| Plover, Grey | - | Amber | - | B |
| **+ Plover, Ringed** | X | Amber | X | B |

| | | | | |
|---|---|---|---|---|
| Pochard | - | Amber | - | B |
| **Redpoll, Lesser** | - | Amber | X | B |
| Redshank | - | Amber | - | B |
| **Scaup, Great** | - | Amber | X | B |
| **Scoter, Common** | X | Red | X | B |
| Shelduck | - | Amber | - | B |
| Shoveler | - | Amber | - | B |
| **Skylark** | - | Red | X | B |
| Snipe, Common | - | Amber | - | B |
| **Sparrow, House** | - | Red | X | B |
| **Starling (roosts)** | - | Red | X | B |
| Stonechat | - | Amber | - | B |
| **Teal, Eurasian** | - | Amber | - | B |
| **Tern, Arctic** | - | Amber | - | B |
| Tern, Common | - | - | - | B |
| Tern, Sandwich | - | Amber | - | B |
| **Thrush, Song** | - | Red | X | B |
| **Tit, Marsh** | - | Red | X | B |
| **Tit, Willow** | - | Red | X | B |
| Turnstone | - | Amber | - | B |
| Twite | - | Red | X | B |
| **Wagtail, Yellow** | - | Amber | X | B |
| Whimbrel | X | Amber | - | B |
| Wigeon | - | Amber | - | B |
| **Warbler, Aquatic** | - | Red | X | B |
| Woodcock | - | Amber | - | B |
| Woodpecker, Green | - | Amber | - | B |
| **Woodpecker, Lesser-spotted** | - | Red | X | B |
| **Yellowhammer** | - | Red | X | B |

W&CA Sch 1 : Wildlife & Countryside Act 1981, Schedule 1

Red Status : Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.

Amber Status : Amber list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.

Sec 42 : Section 42 List of 'Species and Habitats of Principle Importance for the Conservation of Biodiversity in Wales'

## S3) HERPTILES (REPTILES AND AMPHIBIANS)

### REPTILES

The SSSI selection criteria suggest that the best sites supporting three out of the four commoner reptile species should be considered for selection. Beebee & Grayson (1998) suggest that Wildlife Sites should include, *inter alia*, sites with an exceptional population of any one species and sites with moderate populations of two species.

Unfortunately there is no easy method available to establish the size of reptile populations, although standardised survey methods are currently being developed and evaluated (see Foster & Gent 1996). Any reliable quantitative method is, however, likely to be labour intensive and subject to expert interpretation, probably involving the long-term placement of artificial refugia ('tinning' etc.).

Inns (1996) sets out principles for standardised baseline survey, and on the basis of this and other guidance provided in Foster & Gent (1996) the following survey protocol is here suggested:

- Survey in mid morning and/or mid to late afternoon, in April-May and/or Aug-Sept; walk the whole site in a methodical and repeatable manner;
- Survey on warm (not hot), still days with some sun, especially after periods of rain and inspect all banks, ridges, gullies and sunny spots in vegetation; turn over any stones, logs or other potential refugia;
- Survey at least 4 times in a season, ideally over several (i.e. two or more) seasons.

The recording of several (i.e. two or more) individuals of a species on half or more of the survey occasions should be taken to indicate the presence of a 'good' population. Recording of several individuals on every survey occasion (or nearly every occasion) may be indicative of an exceptional population.

Further information can be found on common standards monitoring of reptiles at http://www.jncc.gov.uk/pdf/CSM_reptiles_amphibians1.pdf

The following should be considered for selection:

- sites supporting three or more reptile species

- sites supporting good populations of any reptile species

The occurrence of any reptile species, in any number, on a site should be considered a supporting reason for selection of a site which also qualifies under other guidelines (i.e. on habitat grounds or for species other than reptiles).

The following should be considered for selection:

- sites supporting three or more reptile species

- sites supporting good populations of any reptile species

The occurrence of any reptile species, in any number, on a site should be considered a supporting reason for selection of a site which also qualifies under other guidelines (i.e. on habitat grounds or for species other than reptiles).

## AMPHIBIANS

Groups of ponds may be selected as single sites where these all lie reasonably close to each other (see above), and there is a good probability that there is migration of amphibians between the ponds, together with an appropriate surrounding area of terrestrial habitat.

Any terrestrial habitat known to be used for migration, foraging and wintering should be included; in the absence of direct knowledge of terrestrial habitat use, an area of at least 0.5ha (i.e. 5000 sq m) of terrestrial habitat surrounding the pond, or accessible from it, should be included.

The SSSI criteria suggest selection of sites which have an 'amphibian score' of 5 or more. Beebee & Grayson (1994) provide a scoring system for the evaluation of Wildlife Sites, but this also conflates the presence of great crested newt with other species and requires separate population estimates for all species.

For the purpose of these guidelines it is therefore suggested that 'good' and 'exceptional' populations of species would comprise:

| Species | Survey method | Good | Exceptional |
|---|---|---|---|
| Palmate Newt | Torchlight count of adults at night | 50 | 100 |
| Smooth Newt | Torchlight count of adults at night | 50 | 100 |
| Common Frog | Head count of adults | 100 | 500 |
| Common Toad | Head count of adults | 100 | 500 |

It should be noted that counts made in this manner are normally assumed to represent no more than a small percentage of the actual adult population. The usual rule of thumb is 10% (i.e. a count of 100 adults indicates a population of 1000 individuals).

Further information can be found on common standards monitoring of amphibians at http://www.jncc.gov.uk/pdf/CSM_reptiles_amphibians1.pdf

The following should be considered for selection:

- sites supporting four or more species of amphibian
- sites supporting good populations of three or more species of amphibian
- sites supporting exceptional populations of any single species of amphibian.

## Great Crested Newts

The SSSI criteria suggest the selection of all 'exceptional' sites for great crested newt, assessed as sites where 100+ individuals are counted by torchlight survey at night. 'Good' sites are assessed as those where counts of 10+ individuals are made, and this is considered to be a suitable threshold for Wildlife Site selection.

Grayson (1994) recommends that groups of breeding ponds should be selected collectively as 'pond cluster' Wildlife Sites. Juvenile newts can migrate up to 2km between ponds, whilst adults tend to be more pond-loyal, tending to stay within 250-500m of their spawning pond. It is therefore recommended that qualifying ponds falling within 250m of each other are aggregated together with any suitable intervening terrestrial habitat.

Torchlight surveys should be carried out at night in warm conditions during the peak breeding period (April to mid-June). Important migration routes and terrestrial habitats should ideally be established by means of actual sampling (e.g. using pitfall traps) wherever possible.

Preference should be given to sites supporting 'good' populations of Great Crested Newts rather than all sites, bearing in mind that the species and its habitats are *per se* afforded full statutory protection by the Wildlife & Countryside Act 1981. 'Good populations' are here defined as sites that give counts of 10 or more individuals during torchlight surveys. The Great Crested Newt is also a 'European Protected Species' under the European Habitats Directive (1992) implemented in UK law by The Conservation (Natural Habitats & c) Regulations 1994.

The occurrence of great crested newt, in whatever numbers, should be considered a supporting reason for selection of a site which also qualifies under other guidelines (i.e. on habitat grounds or for species other than great crested newt).

Further information can be found on common standards monitoring of great crested newts at http://www.jncc.gov.uk/pdf/CSM_reptiles_amphibians1.pdf and the Great Crested Newt Handbook is available at http://www.froglife.org/GCNCH/GCNCH.htm

The following should be considered for selection:

- sites supporting 'good populations' of great crested newt, defined here as 10 or more individuals counted by torchlight

## S4) FISH

About 38 native fish species occur in Britain, including estuarine and inshore species, two of which (burbot and houting) are probably now extinct. Knowledge of distribution and population sizes is imprecise and confused due to the difficulty and patchiness of sampling, and the activities of anglers who have translocated species and artificially reinforced populations in many waters.

Of the naturally occurring species, the following are of direct conservation concern in Wales (based on Grice 1994; Maitland & Campbell 1992):

Table 4 **Freshwater fish of conservation significance in Wales (provisional)**

| International/National UK Significant | | | | | |
|---|---|---|---|---|---|
| **Species** | **Type** | **GB/IUCN RDB Status** | **Sec 42 list** | **W&CA** | **Bern** |
| European Eel | Ea | - | X | | |
| Whitefish (Powan, Gwyniad, or Schelly) | S | | X | Sch. 5 | |
| Sea Lamprey | Ea | - | X | | X |
| River Lamprey | Ea | LC | X | | X |
| Brook Lamprey | E | LC | | | X |
| Sturgeon | Ea | CR | X* | Sch. 5 | X |
| Allis Shad | Ea | | X | Sch. 5 | X |
| Twaite Shad | Ea | | X | Part Sch. 5 | X |
| Atlantic Salmon | Ea | | X | | X |
| Grayling | S | | | | X |
| Common Goby | E | | | | |
| Bullhead | S | | | | |

| Regionally Significant | | | | | |
|---|---|---|---|---|---|
| **Species** | **Type** | | **Sec 42** | **W&CA** | **Bern** |
| Arctic Charr | S | | X | | |
| Bleak | S | | | | |
| Smelt (Sparling) | Ea | | X | | |
| Brown/Sea Trout (Sewin) | S/Ea | | X | | |

Type : E = Euryhaline (lives in both salt and freshwater)
S = Stenohaline (freshwater only)
a = Anadromous (matures in sea, migrates into freshwater to spawn)

Sec 42 : Section 42 'List of Species and Habitats of Principle Importance' (WAG, 2008)

W&CA : Wildlife & Countryside Act Sch 5 (fully protected)

Bern : Bern Convention Sch III; Migratory species requiring conservation

EC : European Habitats Directive (1992) Sch II or IV; Species requiring conservation

Further information can be found on common standards monitoring of some freshwater fish (Sea, Brook and River Lamprey; Allis and Twaite Shad; Atlantic Salmon and Bullhead) at http://www.jncc.gov.uk/pdf/CSM_freshwaterfauna_Aug05.pdf

The following should be considered for selection:

- waterbodies supporting resident populations of any species listed in Table 4 above
- watercourses regularly used as migratory routes by anadromous species listed in Table 4 above

Other rare or regionally uncommon species may also occur, but will most probably be the result of introductions. These will require individual consideration by an appropriate specialist. National rarities that could be found, include arctic charr, brook charr and species of whitefish (*Coregonus* sp.). Species that could be regionally significant if found as a naturally occurring population include barbel, silver bream, ruffe and 10-spined stickleback.

## S5) INVERTEBRATES

There are more than 30,000 species of invertebrates in Great Britain. All species have a life cycle which comprises several distinct phases i.e. egg/larvae/pupae/adult or egg/nymph/adult. Therefore a combination of conditions and habitats are usually required by each species for each of these stages. Determination of site boundaries should therefore reflect the habitat and structural diversity needed to sustain a species. It should be noted that often microhabitats such as dead wood or small areas of bare ground may be important in sustaining a species.

### General Guidelines

These guidelines should be applied to all invertebrate taxa (including those taxa with additional specific guidelines). Sites that meet any of the following guidelines should be considered for selection. In the case of less well-known taxa, it is strongly recommended that appropriate specialists and Vice-County recorders are consulted as part of the selection process. The term 'supports' refers to any verified record of a species of wild occurrence in a possible breeding habitat. In general it should therefore be assumed that a record of a species from a site fulfils the 'supports' guideline unless there is evidence to the contrary e.g. the species is an obvious migrant or in totally unsuitable breeding or foraging habitat.

The following should be considered for selection:

- Any site which supports populations of a species, which is listed in the UK Red Data Book, or listed on the Section 42 List with the specific requirement for site protection action (WAG, 2008).

- Any site which supports an important assemblage or population(s) of 'Nationally Scarce' species. To be determined in consultation with appropriate experts.

- Any site which supports a species, recorded from 10 or fewer 10km grid squares in Wales (where the distribution is well known).

- Any site which supports a species that breeds in 4 or fewer sites within a Vice County.

- Any site which supports a significant population or assemblage of Local Priority Species listed in a Local Biodiversity Action Plan.

### Context

Some taxa such as *Lepidoptera* (Butterflies and Moths), *Odonata* (Dragonflies) and *Orthoptera* (Grasshoppers and allied insects) are relatively well known and knowledge of their distribution is generally good. Many taxa however are poorly known and knowledge of their distribution limited by the small number of recorders with the relevant identification expertise. For this reason there are general guidelines covering all taxa and guidelines for specific taxa where there is more complete data on distribution.

Designation should be based where possible on recent data i.e. within the last five years. However where this data is not available, and especially in the case of some species which are difficult to record, older records (and habitat suitability) should also be considered. The term 'Nationally Scarce' refers to species believed to occur in 16 to 100 10km squares in the UK National Grid. The separation of these species into 'Notable A' and 'Notable B', a distinction used in some of the published National Reviews, is not recognised in these guidelines.

Additional Invertebrate Guidelines

The definition of the term 'supports' in the general guidelines also applies to the individual taxa guidelines. The same rules apply to the term 'assemblage' i.e. only those records relating to obvious migrants or species in totally unsuitable breeding or foraging habitat should be excluded.

Table 5 **A draft list of scarce and rare invertebrates recorded in Wales** (after Wales Assembly Government (2008); Wales Biodiversity Species Audit (2003)[1]; JNCC (20071217)[2] and National Biodiversity Network Gateway)

| **A draft list of scarce and rare invertebrates recorded in Wales** + Wales only S 42 invertebrates species | GB/IUCN RDB[2] Status; ***S42 list** | **W&CA Sch. 5[2]** | **Date Range[3]** | **No of hectads[3] in Wales** |
|---|---|---|---|---|
| *Acnemia amoena* (a fungus gnat) | VU[1] | - | 1983-2008 | 3 |
| *Acrometopia wahlbergi* (a true fly) | VU[1] | - | 1983-2008 | 1 |
| ***Acronicta psi* (grey dagger)** | * | - | 1983-2008 | 5 |
| ***Acronicta rumicis* (knot grass)** | * | - | 1983-2008 | 7 |
| ***Adscita statices* (the forester)** | * | - | 1983-2008 | 5 |
| ***Agonopterix atomella* (a micro-moth)** | * | - | 1983-2008 | ? |
| ***Agonum scitulum* (a ground beetle)** | **NR*** | - | 1970-2008 | 1 |
| ***Agrochola helvola* (flounced chestnut)** | * | - | 1983-2008 | 2 |
| ***Agrochola litura* (brown-spot pinion)** | * | - | 1983-2008 | ? |
| ***Agrochola lychnidis* (beaded chestnut)** | * | - | 1983-2008 | 1 |
| *Allomelita pellucida* (a brackish water crustacean) | RDB-indet[1] | - | 1983-2008 | 1 |
| ***Allophyes oxyacanthae* (green brindled chestnut)** | * | - | 1983-2008 | 2 |
| ***Amphipoea oculea* (ear moth)** | * | - | 1983-2008 | - |
| ***Amphipyra tragopoginis* (mouse moth)** | * | - | 1983-2008 | - |
| ***Anania funebris* (a pyramidal moth)** | **NR*** | - | 1983-2008 | ? |
| ***Andrena tarsata* (a mining bee)** | * | - | 1983-2008 | 4 |
| *Anticheta brevipennis* (a snail-killing fly) | VU[1] | - | 1983-2008 | 2 |
| ***Apamea anceps* (large nutmeg)** | * | - | 1983-2008 | - |
| ***Apamea remissa* (dusky brocade)** | * | - | 1983-2008 | - |
| *Aphanotrigonum meijerei* (a true fly) | VU[1] | - | 1983-2008 | 1 |
| ***Aporophyla lutulenta* (deep-brown dart)** | * | - | 1983-2008 | - |
| ***Arctia caja* (garden tiger)** | * | - | 1983-2008 | - |
| *Armadillidium pictum* (a pill woodlouse) | NR[1] | - | 1983-2003 | 2 |
| *Arctoconopa melampodia* (a cranefly) | VU[1] | - | 1983-2008 | 3 |
| ***Argynnis adippe* (high brown fritillary)** | **VU*** | Sch. 5 | 1995-1999 | 8 |
| ***Asilus crabroniformis* (hornet robberfly)** | **NS*** | - | 1983-2008 | - |
| ***Asteroscopus sphinx* (the sprawler)** | * | - | 1983-2008 | - |
| ***Atethmia centrago* (centre-barred sallow)** | * | - | 1983-2008 | - |
| ***Austropotamobius pallipes* (white-clawed crawfish)** | **VU** | Sch. 5 | 1983-2008 | 28 |
| *Bagous tubulus* (a weevil) | VU[1] | - | 1983-2008 | 1 |
| *Bembidion nigropiceum* (a ground beetle) | NS[1] | - | 1983-2008 | 2 |
| ***Bembidion quadripustulatum* (a ground beetle)** | **NS*** | - | 1970-2008 | ? |
| ***Bembidion testaceum* (a ground beetle)** | **NS*** | - | 1970-2008 | 1 |
| ***Bidessus minutissimus* (a diving beetle)** | **NR*** | - | 1983-2008 | 9 |
| ***Blepharita adusta* (dark brocade)** | * | - | 1983-2008 | - |
| ***Boloria euphrosyne* (pearl-bordered fritillary)** | * | part | 1983-2008 | |
| ***Boloria selene* (small pearl-bordered fritillary)** | * | - | 1983-2008 | |
| ***Bombus humilis* (brown banded carder bee)** | * | - | 1983-2008 | |

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|---|---|---|---|---|
| ***Bombus muscorum* (moss carder bee)** | * | - | 1983-2008 | |
| ***Bombus ruderarius* (red-shanked carder bee)** | * | - | 1983-2008 | |
| ***Bombus ruderatus* (large garden bumblebee)** | * | - | 1983-2008 | |
| ***Bombus sylvarum* (shrill carder bee)** | * | - | 1983-2008 | |
| ***Bombylius discolor* (dotted beefly)** | **NS** | - | 1983-2008 | 4 |
| ***Brachylomia viminalis* (minor shoulder knot)** | * | - | 1983-2008 | - |
| ***Brachyptera putata* (northern February red)** | **NS*** | - | 1983-2008 | 3 |
| ***Calosoma inquisitor* (a ground beetle)** | **NR*** | - | 1970-2008 | 8 |
| ***Carabus monilis* (a ground beetle)** | **NS*** | - | 1970-2008 | 3 |
| ***Caradrina morpheus* (mottled rustic)** | * | - | 1983-2008 | 5 |
| ***Celaena haworthii* (Haworth's minor)** | * | - | 1983-2008 | - |
| ***Celaena leucostigma* (the crescent)** | * | - | 1983-2008 | - |
| ***Chesias legatella* (the streak)** | * | - | 1983-2008 | - |
| ***Chesias rufata* (broom-tip)** | * | - | 1983-2008 | - |
| ***Chiasmia clathrata* (latticed heath)** | * | - | 1983-2008 | - |
| *Chirocephalus diaphanous* (fairy shrimp) | VU[1] | Sch. 5 | 1983-2008 | 3 |
| ***Chlaenius tristis* (a ground beetle)** | **EN*** | - | 1970-2008 | 1 |
| ***Chrysis fulgida* (a ruby-tailed wasp)** | **EN*** | - | 1983-2008 | ? |
| *Chrysolina cerealis* (rainbow leaf beetle) | EN[1] | Sch. 5 | 1983-2008 | 1 |
| ***Cicindela germanica* (a tiger beetle)** | **NS*** | - | 1970-2008 | 1 |
| ***Cicindela hybrida* (a tiger beetle)** | **VU*** | - | Pre-1970 | 2 |
| *Cicindela maritime* (a dune tiger beetle) | **NS** | - | 1983-2008 | 13 |
| ***Cliorismia rustica* (a stiletto fly)** | **NR*** | - | 1983-2008 | 4 |
| ***Coenagrion mercuriale* (southern damselfly)** | **VU*** | Sch. 5 | 1983-2008 | 11 |
| ***Coenonympha pamphilusb* (small heath)** | * | - | 1983-2008 | - |
| ***Coenonympha tullia* (large heath)** | * | part | 1983-2008 | - |
| ***Cosmia diffinis* (white spotted pinion)** | * | - | 1983-2008 | - |
| ***Cossus cossus* (goat moth)** | * | - | 1983-2008 | 4 |
| ***Cryptocephalus decemmaculatus* (a leaf beetle)** | **VU*** | - | 1970-2008 | 1 |
| ***Cupido minimus* (small blue)** | * | part | 1995-1999 | 26 |
| ***Cyclophora pendularia* (dingy mocha)** | **NR*** | - | 1983-2008 | - |
| ***Cymatophorima diluta* (oak lutestring)** | * | - | 1983-2008 | - |
| ***Dasypolia templi* (brindled ochre)** | * | - | 1983-2008 | - |
| ***Diarsia rubi* (small-square spot)** | * | - | 1983-2008 | - |
| ***Diloba caeruleocephala* (figure of eight)** | * | - | 1983-2008 | - |
| ***Dipoena inornata* (a comb-footed spider)** | **NS*** | - | 1980-2008 | 4 |
| ***Dolomedes plantarius* (fen raft spider)** | **EN*** | Sch. 5 | 1995-2008 | 2 |
| ***Donacia aquatica* (a reed beetle)** | **NR*** | - | 1995-2008 | 1 |
| ***Donacia bicolora* (a reed beetle)** | **VU*** | - | pre-1950 | 1 |
| ***Ecliptopera silaceata* (small phoenix)** | + | - | 1983-2008 | - |
| ***Empis limata* ( a dancing fly)** | **EN*** | | 1983-2008 | ? |
| ***Ennomos erosaria* (September thorn)** | * | | 1983-2008 | - |
| ***Ennomos fuscantaria* (dusky thorn)** | * | | 1983-2008 | - |
| ***Ennomos quercinaria* (August thorn)** | * | | 1983-2008 | - |
| ***Entephria caesiata* (grey mountain carpet)** | * | | 1983-2008 | - |
| *Ephemera lineate* (greendrakes) | NR/VU[1] | - | 1983-2008 | 2 |
| ***Epirrhoe galiata* (galium carpet)** | * | | 1983-2008 | - |
| ***Erigone welchi* (a money spider)** | * | | 1983-2008 | 1 |
| **+ *Eriopygodes imbecilla* (the silurian)** | **NR*** | - | 1983-2008 | 2 |
| *Erotesis baltica* (a caddis fly) | VU[1] | - | 1983-2008 | 1 |

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|---|---|---|---|---|
| ***Erynnis tages* (dingy skipper)** | * | - | 1995-1999 | >50 |
| ***Eucera longicornis* (long-horned bee)** | **NR*** | - | 1983-2008 | 5 |
| ***Eugnorisma glareosa* (autumnal rustic)** | * | - | 1983-2008 | - |
| ***Eulithis mellinata* (the spinach)** | * | - | 1983-2008 | - |
| ***Eurodryas aurinia* (marsh fritillary)** | * | | 1983-2008 | - |
| ***Eustroma reticulate* (netted carpet)** | **VU*** | - | 1983-2008 | - |
| ***Euxoa nigricans* (garden dart)** | * | - | 1983-2008 | - |
| *Formica candida (picea)* (black bog ant) | EN[1] | - | 1983-2008 | 3 |
| *Formica rufa* (southern wood ant) | LC[1] | - | 1983-2008 | 21 |
| ***Formicoxenus nitidulus* (shining guest ant)** | * | - | 1983-2008 | 1 |
| ***Graphiphora augur* (double dart)** | * | - | 1983-2008 | - |
| ***Gryllotalpa gryllotalpa* (mole cricket)** | **EN*** | Sch. 5 | pre-1950 | 5 |
| ***Hagenella clathrata* (a caddis fly)** | **EN*** | - | 1983-2008 | 1 |
| ***Haplodrassus dalmatensis* (a spider)** | * | - | pre-1969 | 2 |
| ***Harpalus melancholicus* (a ground beetle)** | **EN*** | - | 1983-2008 | 1 |
| *Heliophanus dampfi* (a spider) | RDB-indet[1] | - | 1983-2008 | 1 |
| ***Heliophobus reticulata* (bordered gothic)** | * | - | 1983-2008 | - |
| ***Hemaris tityus* (narrow-bordered bee hawk-moth)** | * | - | 1983-2008 | 5 |
| ***Hemistola chrysoprasaria* (small emerald)** | * | - | 1983-2008 | - |
| ***Hepialus humuli* (ghost moth)** | * | - | 1983-2008 | - |
| ***Hipparchia semele* (grayling)** | * | - | 1983-2008 | |
| *Hirundo medicinalis* (medicinal leech) | NS[1] | - | 1983-2008 | 9 |
| ***Hoplodrina blanda* (the rustic)** | * | - | 1983-2008 | - |
| ***Hydraecia micacea* (rosy rustic)** | * | - | 1983-2008 | - |
| **+ *Hydrochara caraboides* (lesser silver water beetle)** | **EN*** | Sch. 5 | 1983-2008 | 2 |
| *Hydrophilus piceus* (great silver diving beetle) | NR[1] | - | 1983-2008 | 3 |
| ***Hydroporus rufifrons* (a diving beetle)** | **VU*** | - | 1983-2008 | 1 |
| **+ *Idaea contiguaria* (weaver's wave)** | * | - | 1983-2008 | 3 |
| ***Idaea dilutaria* (silky wave)** | **NR*** | - | 1983-2008 | 4 |
| ***Idiocera sexguttata* (a cranefly)** | * | - | 1983-2008 | 1? |
| ***Isogenus nubecula* (a stonefly)** | **VU*** | - | 1983-2008 | 1 |
| ***Jodia croceago* (upper orangewing)** | **NR*** | | 1983-2008 | 1 |
| ***Lampronia capitella* (currant shoot borer)** | * | - | 1983-2008 | - |
| ***Lasiommata megera* (w all)** | * | - | 1983-2008 | |
| ***Leptidea sinapis* (wood white)** | * | - | 1983-2008 | |
| ***Limenitis camilla* (white admiral)** | * | - | 1983-2008 | |
| ***Lipsothrix errans* (a cranefly)** | **NS*** | - | 1983-2008 | 5 |
| ***Lipsothrix nervosa* (a cranefly)** | **NS*** | - | 1983-2008 | 17 |
| ***Lipsothrix nigristigma* (a cranefly)** | **NR*** | - | 1983-2008 | ? |
| ***Lophopus crystallinus* ( a freshwater bryozoan)** | **NR*** | - | Pre-1969 | 1 |
| ***Lucanus cervus* (stag beetle)** | **NS*** | - | 1983-2008 | 1 |
| ***Lycia hirtaria* (brindled beauty)** | * | - | 1983-2008 | - |
| ***Lycia zonaria subsp. britannica* (belted beauty)** | **NR*** | - | 1983-2008 | 1 |
| ***Macaria wauaria* (V moth)** | * | - | 1983-2008 | - |
| ***Malacosoma neustria* (the lackey)** | * | - | 1983-2008 | - |
| ***Margaritifera margaritifera* (freshwater pearl mussel)** | **EN*** | Sch. 5 | 1983-2008 | 13 |
| ***Mecopisthes peusi* (a money spider)** | **NS*** | - | 1983-2008 | 3 |
| ***Meioneta mollis* (a money spider)** | **NS*** | - | 1983-2008 | 2 |
| ***Melanchra persicariae* (dot moth)** | * | - | 1983-2008 | - |
| ***Melanchra pisi* (broom moth)** | * | - | 1983-2008 | - |

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|---|---|---|---|---|
| ***Melanthia procellata*** **(pretty chalk carpet)** | * | - | 1983-2008 | - |
| ***Meloe proscarabaeus*** **(an oil beetle)** | **NS*** | - | 1983-2008 | ? |
| ***Meloe rugosus*** **(an oil beetle)** | **NR*** | - | 1983-2008 | ? |
| ***Meloe violaceus*** **(an oil beetle)** | **NS*** | - | 1983-2008 | ? |
| ***Meotica anglica*** **(a rove beetle)** | **NR*** | - | 1983-2008 | 4 |
| ***Mesoligia literosa*** **(rosy minor)** | * | - | 1983-2008 | - |
| ***Minoa murinata*** **(drab looper)** | * | - | 1983-2008 | - |
| *Metatrichoniscoides celticus* (a woodlouse) | VU[1] | - | 1983-2008 | 3 |
| ***Monocephalus castaneipes*** **(a money spider)** | * | | 1983-2008 | 11 |
| ***Mythimna comma*** **(shoulder-striped wainscot)** | * | - | 1983-2008 | 8 |
| ***Myxas glutinosa*** **(glutinous snail)** | **EN*** | Sch. 5 | 1983-2008 | 2 |
| ***Nemapogon picarella*** **(a micro moth)** | * | - | 1983-2008 | ? |
| ***Nematopogon magna*** **(a micro moth)** | * | - | 1983-2008 | ? |
| ***Nigrobaetis niger*** **(iron blue mayfly)** | * | - | 1983-2008 | 13 |
| ***Noctua orbona*** **(lunar yellow underwing)** | * | - | 1983-2008 | 6 |
| ***Notioscopus sarcinatus*** **(a money spider)** | * | - | 1983-2008 | 2 |
| ***Ochthebius poweri*** **(a water beetle)** | **NR*** | - | 1983-2008 | 2 |
| ***Odontomyia hydroleon*** **(a soldier fly)** | **EN*** | - | 1983-2008 | 2 |
| ***Odynerus melanocephalus*** **(a mason-wasp)** | **NR*** | - | 1983-2008 | 1 |
| ***Omphiscola glabra*** **(mud snail)** | **VU*** | - | 1983-2008 | 2 |
| ***Orthonama vittata*** **(oblique carpet)** | * | - | 1983-2008 | - |
| ***Orthosia gracilis*** **(powdered quaker)** | * | - | 1983-2008 | - |
| ***Osmia parietina*** **(a mason bee)** | **NR*** | - | 1983-2008 | 3 |
| ***Osmia xanthomelana*** **(a mason bee)** | **EN*** | - | 1983-2008 | 2 |
| *Oxyethira mirabilis* (a caddis fly) | DD[1] | - | 1983-2008 | 4 |
| ***Panagaeus cruxmajor*** **(a ground beetle)** | **EN*** | | 1983-2008 | 2 |
| ***Pelurga comitata*** **(dark spinach)** | * | - | 1983-2008 | - |
| ***Perizoma albulata subsp. albulata*** **(grass rivulet)** | * | - | 1983-2008 | - |
| ***Philodromus fallax*** **(a running crab spider)** | * | - | 1983-2008 | 5 |
| *Phyllonorycter sagitella* (a micro moth) | * | | 1983-2008 | ? |
| ***Pisidium tenuilineatum*** **(fine-lined pea mussel)** | **NR*** | | 1983-2008 | 1 |
| ***Plebejus argus*** **(Silver-studded blue)** | * | part | 1983-2008 | 18 |
| *Polia bombycina* (pale shining brown) | * | | 1983-2008 | 1 |
| ***Potamanthus luteus*** **(a mayfly)** | **NR/VU*** | | 1983-2008 | 1 |
| ***Pseudanodonta complanata*** **(depressed river mussel)** | **?/LC*** | - | 1983-2008 | 2 |
| *Pyrausta sanguinalis* (a pyramidal moth) | * | - | 1983-2008 | ? |
| *Pyrgus malvae* (grizzled skipper) | * | - | 1995-1999 | 10 |
| *Rhabdomastix japonica* (a cranefly) | * | - | 1983-2008 | ? |
| *Rheumaptera hastate* (argent and sable) | * | - | 1983-2008 | 3 |
| ***Saaristoa firma*** **(a money spider)** | * | - | 1983-2008 | 10 |
| + ***Sabra harpagula*** **(scarce hook-tip)** | * | - | 1983-2008 | - |
| ***Satyrium w-album*** **(white letter hairstreak)** | * | partly | 1995-1999 | 26 |
| ***Scopula marginepunctata*** **(mullein wave)** | * | - | 1983-2008 | - |
| ***Scotopteryx bipunctaria*** **(chalk carpet)** | * | - | 1983-2008 | - |
| ***Scotopteryx chenopodiata*** **(shaded bar-shoulder)** | * | - | 1983-2008 | - |
| ***Sitticus caricis*** **(a jumping spider)** | * | - | 1983-2008 | 2 |
| ***Spilosoma lubricipeda*** **(white ermine)** | * | - | 1983-2008 | - |
| ***Spilosoma luteum*** **(buff ermine)** | * | - | 1983-2008 | - |
| ***Stilbia anomala*** **(the anomalous)** | * | - | 1983-2008 | 3 |
| + ***Synanthedon scoliaeformis*** **(Welsh clearwing)** | **NR*** | - | 1983-2008 | 1 |

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|---|---|---|---|---|
| ***Synaptus filiformis* (hairy click beetle)** | **EN*** | - | Pre-1969 | 1 |
| *Tinodes pallidulus* (a caddis fly) | EN | - | 1983-2008 | 1 |
| ***Thecla betulae* (brown hairstreak)** | * | part | 1983-2008 | |
| ***Thinobius newberyi* (a rove beetle)** | **RDB-indet** | - | 1983-2008 | 3 |
| ***Tholera cespitis* (hedge rustic)** | * | - | 1983-2008 | - |
| ***Tholera decimalis* (feathered gothic)** | * | - | 1983-2008 | - |
| ***Timandra comae* (blood-vein)** | * | - | 1983-2008 | - |
| ***Trichiura crataegi* (pale eggar)** | * | - | 1983-2008 | - |
| ***Tyria jacobaeae* (the cinnabar)** | * | - | 1983-2008 | - |
| ***Vertigo angustior* (narrow-mouthed whorl shell)** | **LR(cd)*** | - | 1983-2008 | 2 |
| ***Vertigo geyeri* (Geyer's whorl shell)** | **EN/LRcd*** | - | 1983-2008 | 3 |
| ***Vertigo moulinsiana* (Desmoulin's whorl shell)** | **NR*** | - | 1983-2008 | 1 |
| ***Watsonalla binaria* (oak hook-tip)** | * | - | 1983-2008 | - |
| ***Xanthia gilvago* (dusky-lemon sallow)** | * | - | 1983-2008 | - |
| ***Xanthia icteritia* (the sallow)** | * | - | 1983-2008 | - |
| ***Xanthorhoe decoloraria* (red carpet)** | * | - | 1983-2008 | - |
| ***Xanthorhoe ferrugata* (dark-barred twin-spot carpet)** | * | - | 1983-2008 | - |
| ***Xestia agathina* (Ashworth's rustic)** | * | - | 1983-2008 | - |
| ***Xestia castanea* (neglected rustic)** | * | - | 1983-2008 | - |
| ***Xylena exsoleta* (sword-grass)** | * | - | 1983-2008 | - |

## Lepidoptera (Butterflies and Moths)

The Lepidoptera guidelines in Bodé, G. (2004) were based upon Butterfly Conservation's National Action Plan for Wales (1998). This national action plan is being revised in 2008 in the light of the S42 list, and therefore these guidelines may be subject to revision at a later date.

Further information, species information and contracts are available on the Butterfly Conservation website: http://www.butterfly-conservation.org/

## Butterflies

Butterflies are the most popular and best known of invertebrates. The habitat requirements, larval food plants and favoured nectar sources are well known. The determination of site boundaries should therefore reflect all elements necessary to support the qualifying species or communities.

In the interim the following should be considered for selection:

- Any site which supports a S42 species listed in Table 6a (see below).
- Sites which support significant populations or assemblages of species listed in Table 6b (see below). Their presence should also contribute towards the designation of sites that qualify under other guidelines.

'Significance' should be determined by LBAP partnerships in consultation with Butterfly Conservation and the appropriate Vice-County recorders.

Table 6a **Butterflies of conservation significance in Wales**
(after Wales Assembly Government (2008)*; JNCC (20071217)[1]; Asher, J. et all (2001)[2] and Anon (2007)[3])

| **Butterflies of conservation significance in Wales** | **GB/IUCN RDB[2] Status; *S42 list** | **Date Range[2]** | **No of hectads[2] in Wales** | Biodivesity Action[3] | | |
|---|---|---|---|---|---|---|
| | | | | Site | Habitat Condition /expansion | Monitor Known/ New |
| *Argynnis adippe* (high brown fritillary) | **VU*** | 95-99 | 9 | X | condition | - |
| *Boloria euphrosyne* (pearl-bordered fritillary) | * | 95-99 | 17 | X | condition | - |
| *Boloria selene* (small pearl-bordered fritillary) | * | 95-99 | >50 | X | condition | - |
| *Coenonympha tullia* (large heath) | * | 95-99 | 13 | - | condition | New |
| *Cupido minimus* (small blue) | * | 95-99 | 25 | X | condition | - |
| *Erynnis tages* (dingy skipper) | * | 95-99 | >50 | X | condition | - |
| *Eurodryas aurinia* (marsh fritillary) | * | 95-99 | >50 | X | condition | - |
| *Leptidea sinapis* (wood white) | * | 95-99 | 2 | X | condition | - |
| *Limenitis camilla* (white admiral) | * | 95-99 | 3 | X | condition | - |
| *Plebejus argus* (silver-studded blue) | **Rare*** | 95-99 | 15 | X | condition | - |
| *Pyrgus malvae* (grizzled skipper) | * | 95-99 | 10 | X | condition | - |
| *Satyrium w-album* (white letter hairstreak) | * | 95-99 | 26 | X | expansion | - |
| *Thecla betulae* (brown hairstreak) | * | 95-99 | 28 | X | condition | - |

Table 6b **Butterflies of medium conservation significance in Wales**
(after Wales Assembly Government (2008)*; JNCC (20071217)[1]; Asher, J. et all (2001)[2] and Anon (2007)[3])

| **Butterflies of conservation significance in Wales** | **GB/IUCN RDB[2] Status; *S42 list** | **Date Range[2]** | **No of hectads[2] in Wales** | Biodivesity Action[3] | | |
|---|---|---|---|---|---|---|
| | | | | Site | Habitat Condition /expansion | Monitor Known/ New |
| *Argynnis aglaja* (dark green fritillary) | - | 95-99 | >100 | - | - | - |
| *Argynnis paphia* (silver-washed fritillary) | - | 95-99 | >50 | - | - | - |
| *Coenonympha pamphilus* (small heath) | * | 95-99 | >100 | - | - | X |
| *Hipparchia semele* (grayling) | * | 95-99 | >100 | X | - | |
| *Lasiommata megera* (wall) | * | 95-99 | >100 | - | - | X |

## Moths

The following guidelines apply to moths. There is a considerable volume of data on moths for some parts of Wales. The interpretation of this data requires expertise, as many records refer to migrants or species of casual occurrence. This is partly a result of the nature of the records, many of which come from light traps which attract individuals from surrounding sites. Sites should normally only be designated if they contain suitable habitat which contributes to the maintenance of populations of the species concerned.

The following should be considered for selection:

- The presence of any S42 species listed in Table 7a (see below).
- The presence of any S42 species listed in Table 7b (see below) should contribute towards the designation of sites that qualify under other guidelines.

Table 7a **Moths of conservation significance in Wales**
(after Wales Assembly Government (2008)*; JNCC (20071217)[2] and Anon (2007)[3])

| **Moths of conservation significance in Wales**<br>+ Wales only S 42 invertebrates species | **GB/IUCN RDB[2] Status; *S42 list** | Biodivesity Action[3] | | |
|---|---|---|---|---|
| | | Site | Habitat Condition | Monitor Known/ New |
| *Cyclophora pendularia* (dingy mocha) | Rare* | X | - | - |
| + *Eriopygodes imbecilla* (the silurian) | Rare* | X | - | - |
| *Eustroma reticulate* (netted carpet) | VU* | X | - | - |
| *Idaea dilutaria* (silky wave) | Rare* | X | - | - |
| *Lycia zonaria subsp. britannica* (belted beauty) | Rare* | - | - | - |
| *Minoa murinata* (drab looper) | * | X | - | - |
| *Phyllonorycter sagitella* (a micro moth) | * | X | - | - |
| *Pyrausta sanguinalis* (a pyramidal moth) | * | X | - | - |
| + *Sabra harpagula* (scarce hook-tip) | Rare* | X | - | - |
| + *Synanthedon scoliaeformis* (Welsh clearwing) | Rare* | X | - | - |

Table 7b **Moths of contributory conservation significance in Wales**
(after Wales Assembly Government (2008)*; JNCC (20071217)[2] and Anon (2007)[3])

| **Moths of conservation significance in Wales**<br>+ Wales only S 42 invertebrates species | **GB/IUCN RDB[2] Status; *S42 list** | Biodivesity Action[3] | | |
|---|---|---|---|---|
| | | Site | Habitat Condition | Monitor Known/ New |
| *Adscita statices* (the forester) | * | - | - | - |
| *Anania funebris* (a pyramidal moth) | NR* | - | - | - |
| *Chesias rufata* (broom-tip) | * | - | - | - |
| *Cosmia diffinis* (white spotted pinion) | * | - | - | - |
| *Cossus cossus* (goat moth) | * | - | - | - |
| *Heliophobus reticulata* (bordered gothic) | * | - | - | - |
| *Hemaris tityus* (narrow-bordered bee hawk-moth) | * | - | - | - |
| + *Idaea contiguaria* (weaver's wave) | * | - | - | - |
| *Jodia croceago* (upper orangewing) | NR* | - | - | - |
| *Lampronia capitella* (currant shoot borer) | * | - | - | - |
| *Nemapogon picarella* (a micro moth) | * | - | - | - |
| *Nematopogon magna* (a micro moth) | * | - | - | - |
| *Noctua orbona* (lunar yellow underwing) | * | - | - | - |
| *Polia bombycina* (pale shining brown) | * | - | - | - |
| *Rheumaptera hastate* (argent and sable) | * | - | - | - |
| *Scotopteryx bipunctaria* (chalk carpet) | * | - | - | - |
| *Xestia agathina* (Ashworth's rustic) | * | - | - | - |
| *Xylena exsoleta* (sword-grass) | * | - | - | - |

S74 lists 68 moth species for research only and these are listed in Table 7c for completeness.

Table 7c **Priority Moths listed on the S42 list for research only**
(after Wales Assembly Government (2008) and Anon (2007)[2])

| **Priority Moths listed on the S42 list for research only[2]** |
|---|
| *Acronicta psi* (grey dagger) |
| *Acronicta rumicis* (knot grass) |
| *Agonopterix atomella* (a micro-moth) |
| *Agrochola helvola* (flounced chestnut) |
| *Agrochola litura* (brown-spot pinion) |
| *Agrochola lychnidis* (beaded chestnut) |
| *Allophyes oxyacanthae* (green brindled chestnut) |
| *Amphipoea oculea* (ear moth) |
| *Amphipyra tragopoginis* (mouse moth) |
| *Apamea anceps* (large nutmeg) |
| *Apamea remissa* (dusky brocade) |
| *Aporophyla lutulenta* (deep-brown dart) |
| *Arctia caja* (garden tiger) |
| *Asteroscopus sphinx* (the sprawler) |
| *Atethmia centrago* (centre-barred sallow) |
| *Blepharita adusta* (dark brocade) |
| *Brachylomia viminalis* (minor shoulder knot) |
| *Caradrina morpheus* (mottled rustic) |
| *Celaena haworthii* (Haworth's minor) |
| *Celaena leucostigma* (the crescent) |
| *Chesias legatella* (the streak) |
| *Chiasmia clathrata* (latticed heath) |
| *Cymatophorima diluta* (oak lutestring) |
| *Dasypolia templi* (brindled ochre) |
| *Diarsia rubi* (small-square spot) |
| *Diloba caeruleocephala* (figure of eight) |
| *Ecliptopera silaceata* (small phoenix) |
| *Ennomos erosaria* (September thorn) |
| *Ennomos fuscantaria* (dusky thorn) |
| *Ennomos quercinaria* (August thorn) |
| *Entephria caesiata* (grey mountain carpet) |
| *Epirrhoe galiata* (galium carpet) |
| *Eugnorisma glareosa* (autumnal rustic) |
| *Eulithis mellinata* (the spinach) |
| *Euxoa nigricans* (garden dart) |
| *Graphiphora augur* (double dart) |
| *Hemistola chrysoprasaria* (small emerald) |
| *Hepialus humuli* (ghost moth) |
| *Hoplodrina blanda* (the rustic) |
| *Hydraecia micacea* (rosy rustic) |
| *Lycia hirtaria* (brindled beauty) |
| *Macaria wauaria* (the V moth) |
| *Malacosoma neustria* (the lackey) |
| *Melanchra persicariae* (dot moth) |
| *Melanchra pisi* (broom moth) |
| *Melanthia procellata* (pretty chalk carpet) |
| *Mesoligia literosa* (rosy minor) |

| Priority Moths listed on the S42 list for research only[2] |
|---|
| *Mythimna comma* (shoulder-striped wainscot) |
| *Orthonama vittata* (oblique carpet) |
| *Orthosia gracilis* (powdered quaker) |
| *Pelurga comitata* (dark spinach) |
| *Perizoma albulata subsp. albulata* (grass rivulet) |
| *Scopula marginepunctata* (mullein wave) |
| *Scotopteryx chenopodiata* (shaded bar-shoulder) |
| *Spilosoma lubricipeda* (white ermine) |
| *Spilosoma luteum* (buff ermine) |
| *Stilbia anomala* (the anomalous) |
| *Tholera cespitis* (hedge rustic) |
| *Tholera decimalis* (feathered gothic) |
| *Timandra comae* (blood-vein) |
| *Trichiura crataegi* (pale eggar) |
| *Tyria jacobaeae* (cinnabar) |
| *Watsonalla binaria* (oak hook-tip) |
| *Xanthia gilvago* (dusky-lemon sallow) |
| *Xanthia icteritia* (the sallow) |
| *Xanthorhoe decoloraria* (red carpet) |
| *Xanthorhoe ferrugata* (dark-barred twin-spot carpet) |
| *Xestia castanea* (neglected or grey rustic) |

## Odonata (Dragonflies and Damselflies)

Although this taxon is relatively well known, the distribution of some species is still unclear and range changes may be occurring. It will therefore be necessary to review the status of some species in the light of new data in the future. The determination of site boundaries should include foraging areas for adults as well as breeding water-bodies.

Further resources are available from the British Dragonfly Society www.dragonflysoc.org.uk , and species accounts are given in Corbet, P. and Brooks, S. (2008).

The following should be considered for selection:

- Any site which supports a species which is 'Nationally Scarce'
- Any site which supports an assemblage of 9 or more species
- Any site which supports any species in list 'A' of Table 8(a) (see below)
- Sites which support significant populations or assemblages of species in list 'B' of Table 8(b) (see table below). Their presence should also contribute towards the designation of sites that qualify under other guidelines.

'Significance' should be determined by LBAP partnerships in consultation with the appropriate Vice-County recorders.

## Table 8(a) Dragonflies and Damselflies of conservation significance

| ODONATA LIST A | UK RDB Status | S.42 list | Date Range | No of Hectads in Wales |
|---|---|---|---|---|
| White-legged Damselfly (*Platycnemis pennipes)* | - | - | 1975-2008 | 22 |
| Small Red Damselfly (*Ceriagrion tenellum)* | Rare | - | 1975-2008 | 19 |
| Southern Damselfly (*Coenagrion mercuriale)* | VU | S. 42 | 1975-2008 | 11 |
| Variable Damselfly (*Coenagrion pulchellum)* | - | - | 1975-2008 | 23 |
| Red-eyed Damselfly (*Erythromma najas)* | - | - | 1975-2008 | 15 |
| Hairy Dragonfly (*Brachytron pratense)* | - | - | 1975-2008 | 35 |
| Club-tailed Dragonfly (*Gomphus vulgatissimus)* | - | - | 1975-2008 | 18 |
| Downy Emerald (*Cordulia aenea)* | - | - | 1975-2008 | 3 |
| Ruddy Darter (*Sympetrum sanguineum)* | - | - | 1975-2008 | 19 |

## Table 8(b) Dragonflies and Damselflies of conservation significance

| ODONATA LIST B | UK RDB Status | S.42 list | Date Range | No of Hectads in Wales |
|---|---|---|---|---|
| Beautiful Demoiselle (*Calopteryx virgo)* | - | - | 1975-2008 | >150 |
| Banded Demoiselle (*Calopteryx splendens)* | - | - | 1975-2008 | >100 |
| Emerald Damselfly (*Lestes sponsa)* | - | - | 1975-2008 | >150 |
| Scarce Blue-tailed Damselfly (*Ischnura pumilio)* | NS | - | 1975-2008 | >50 |
| Brown Hawker (*Aeshna grandis)* | - | - | 1975-2008 | 18 |
| Golden-ringed Dragonfly (*Cordulegaster boltonii)* | - | - | 1975-2008 | >200 |
| Black-tailed Skimmer (*Orthetrum cancellatum)* | - | - | 1975-2008 | 30 |
| Keeled Skimmer (*Orthetrum coerulescens)* | - | - | 1975-2008 | >50 |
| Black Darter (*Sympetrum danae)* | - | - | 1975-2008 | >100 |

### Orthoptera (Grasshoppers and allied insects)

Some species are probably under-recorded in Wales and others are currently expanding their range.

The following should be considered for selection;

- Any site which supports a species which is 'Nationally Scarce'.
- Any site which supports an assemblage of 7 or more species.
- Any site which supports any species in list 'A' of Table 9(a) (see below).
- Sites which support significant populations or assemblages of species in list 'B' of Table 9(b) (see below). Their presence should also contribute towards the designation of sites which qualify under other guidelines.

'Significance' should be determined by LBAP partnerships in consultation with the appropriate Vice-County recorders.

## Table 9(a) Grasshoppers and allied insects of conservation significance

| ORTHOPTERA AND ALLIED INSECTS LIST A | UK RDB Status | S.42 list | Date Range | No of Hectads in Wales |
|---|---|---|---|---|
| *Acheta domesticus* (house cricket) | | - | 1983-2008 | 14 |
| *Chorthippus albomarginatus* (lesser marsh grasshopper) | | - | 1983-2008 | 8 |
| *Conocephalus discolor* (long-winged conehead) | | - | 1983-2007 | 2 |
| *Ectobius pallidus* (tawny cockroach) | | - | 1983-2008 | 4 |
| *Forficula lesnei* (Lesne's earwig) | | - | 1983-2008 | 4 |
| ***Gryllotalpa gryllotalpa* (mole cricket)** | **EN** | **S.42** | Pre 1950 | 5 |
| *Metrioptera brachyptera* (bog cricket) | | - | 1983-2007 | 10 |
| *Metrioptera roeseli* (Roesel's bushcricket) | | - | 1983-2008 | 1 |
| *Platycleis albopunctata* (grey bushcricket) | | - | 1983-2008 | 11 |
| *Tetrix ceperoi* (Cepero's groundhopper) | | - | 1983-2007 | 9 |
| *Tetrix subulata* (slender groundhopper | | - | 1983-2008 | 18 |
| *Tettigonia viridissima* (great green bushcricket) | | - | 1983-2008 | 17 |
| *Pseudomogoplistes squamiger* (scaly cricket) | | - | 1983-2007 | ? |

## Table 9(b) Grasshoppers and allied insects of conservation significance

| ORTHOPTERA AND ALLIED INSECTS LIST B | UK RDB Status | S.42 list | Date Range | No of Hectads in Wales |
|---|---|---|---|---|
| *Conocephalus dorsalis* (short-winged conehead) | | - | 1983-2008 | 26 |
| *Leptophyes punctatissima* (speckled bushcricket) | | - | 1983-2008 | 50 |
| *Meconema thalassinum* (oak bushcricket) | | - | 1983-2007 | 44 |
| *Myrmeleotettix maculates* (mottled grasshopper) | | - | 1983-2008 | >50 |

## S6) VASCULAR PLANTS

A great many rare and notable plant species have been recorded at various times, often as casuals or introduced aliens. In other cases plants which are known to be rare natives elsewhere in the UK have been deliberately planted or otherwise introduced in the past, particularly in popular woodland sites, so the native/alien status of plants on site is important.

There are 78 species of vascular plants and one group of endangered Hieracium species prioritised for biodiversity action by the 2008 section 42 list given below.

Table 11 **The Section 42 (2008) list of Vascular Plants** (after Wales Assembly Government (2008), JNCC, (20071217)[2] and Preston *et al*, 2002[3])

| **Section 42 list of Vascular Plants (2008)**<br>**+ Wales only S 42 Vascular plant species** | GB/IUCN RDB[2] Status | W&CA[2] | Date Range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| *Artemisia campestris subsp maritima* (dune wormwood) | NR/VU | - | 1987-1999 | |
| + *Asplenium trichomanes subsp. pachyrachis* (a lobed maidenhair fern) | NR/NT | - | 1987-1999 | 5 |
| *Asparagus prostratus* (wild asparagus) | NR/EN | - | 1987-1999 | 3 |
| *Blysmus compressus* (flat-sedge) | VU | - | 1987-1999 | 1 |
| *Bupleurum tenuissimum* (slender hare`s-ear) | NS/VU | - | 1987-1999 | 7 |
| *Campanula patula* (spreading bellflower) | NS/EN | - | 1987-1999 | 12 |
| *Carex divisa* (divided sedge) | NS/VU | - | 1987-1999 | 3 |
| *Centaurea cyanus* (cornflower) | LC | - | 1987-1999 | 33 |
| *Centaurium scilloides* (perennial centaury) | NR/EN | - | 1987-1999 | 1 |
| *Cephalanthera longifolia* (narrow-leaved helleborine) | NS/VU | - | 1987-1999 | 5 |
| *Cerastium arcticum* (arctic mouse-ear) | NR/NT | - | 1987-1999 | 2 |
| *Chamaemelum nobile* (chamomile) | VU | - | 1987-1999 | 8 |
| *Cicendia filiformis* (yellow centaury) | NS/VU | - | 1987-1999 | 4 |
| *Clinopodium acinos* (basil thyme) | ?/VU | - | 1987-1999 | 8 |
| *Cotoneaster cambricus* (wild cotoneaster) | NR/CR | Sch. 8 | 1987-1999 | 1 |
| *Dactylorhiza purpurella subsp. cambrensis* (a marsh orchid) | ?/LC | - | 1987-1999 | ? |
| *Dactylorhiza viridis* (frog orchid) | ?/VU | - | 1987-1999 | 17 |
| *Dianthus armeria* (Deptford pink) | NS/EN | Sch.8 | 1987-1999 | 2 |
| *Euphrasia anglica* (glandular eyebright) | ?/EN | - | 1987-1999 | 39 |
| *Euphrasia cambrica* (Welsh eyebright) | NR/VU | - | 1987-1999 | 3 |
| *Euphrasia ostenfeldii* (an eyebright) | NS/DD | - | 1987-1999 | 5 |
| *Euphrasia pseudokerneri* (chalk eyebright) | NS/EN | - | 1987-1999 | 4 |
| *Euphrasia rivularis* (an eyebright) | NR/VU | - | 1987-1999 | 2 |
| *Euphrasia rostkoviana subsp. montana* (an eyebright) | NS/VU | - | 1987-1999 | 4 |
| *Fumaria purpurea* (purple ramping-fumitory) | NS/LC | - | 1987-1999 | 2 |
| *Galeopsis angustifolia* (red hemp-nettle) | NS/CR | - | 1987-1999 | 4 |
| + *Galeopsis segetum* (downy hemp-nettle) | ?/EX | - | 1987-1999 | 2 |
| + *Galeopsis speciosa* (large-flowered hemp-nettle) | ?/VU | - | 1987-1999 | 35 |
| *Gentianella anglica* (early gentian) | ? | Sch. 8 | 1987-1999 | 1 |
| *Gentianella campestris* (field gentian) | ?/VU | - | 1987-1999 | 13 |
| *Gentianella uliginosa* (dune gentian) | NR/VU | Sch. 8 | 1987-1999 | 5 |
| + *Gymnadenia borealis* (northern fragrant orchid) | ?/LC | - | 1987-1999 | 5 |
| + *Gymnadenia conopsea* (fragrant orchid) | ?/LC | - | 1987-1999 | 59 |
| + *Gymnadenia densiflora* (marsh fragrant orchid) | ?/DD | - | 1987-1999 | 7 |
| + *Hammarbya paludosa* (bog orchid) | ?/LC | Sch. 8 | 1987-1999 | 11 |
| + *Hieracium* Group Plan (6 species) Hawkweed Group Plan | NR/CR | - | 1987-1999 | - |
| *Hordeum marinum* (sea barley) | NS/VU | - | 1987-1999 | 7 |
| *Juniperus communis* (juniper) | -/LC | - | 1987-1999 | 32 |

| **Section 42 list of Vascular Plants (2008)**<br><br>**+ Wales only S 42 Vascular plant species** | GB/IUCN RDB[2] Status | W&CA[2] | Date Range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| *Juniperus communis subsp. hemisphaerica* (a juniper) | NR/CR | - | 1987-1999 | 1 |
| *Liparis loeselii* (fen orchid) | NR/CR | Sch. 8 | 1987-1999 | 4 |
| *Luronium natans* (floating water plantain) | NS/LC | Sch. 8 | 1987-1999 | 30 |
| *Matthiola sinuata* (sea stock) | NR/VU | | 1987-1999 | 6 |
| *Melittis melissophyllum* (bastard balm) | NS/VU | | 1987-1999 | 6 |
| *Mentha pulegium* (pennyroyal) | NS/VU | Sch. 8 | 1987-1999 | 4 |
| *Monotropa hypopitys* (yellow bird's-nest) | ?/EN | Sch. 8 | 1987-1999 | 16 |
| *Monotropa hypopitys subsp. hypophegea* (a bird's-nest) | NS/EN | - | 1987-1999 | - |
| *Monotropa hypopitys subsp. hypopitys* (a bird's-nest) | NS/EN | - | 1987-1999 | - |
| *Neotinea ustulata* (burnt tip orchid) | NS/EN | - | 1987-1999 | 1 |
| *Oenanthe fistulosa* (tubular water dropwort) | ?/VU | - | 1987-1999 | 52 |
| *Ophrys insectifera* (fly orchid) | ?/VU | - | 1987-1999 | 4 |
| *Pilularia globulifera* (pillwort) | NS/NT | Sch. 8 | 1987-1999 | 23 |
| *Poa glauca* (glaucous meadow-grass) | NS/VU | - | 1987-1999 | 2 |
| *Polystichum lonchitis* (holly-fern) | ?/VU | - | 1987-1999 | 4 |
| *Potamogeton compressus* (grass-wrack pondweed) | NS/EN | - | 1987-1999 | 5 |
| *Potentilla rupestris* (rock cinquefoil) | NR/EN | Sch.8 | 1987-1999 | 2 |
| *Pseudorchis albida* (small-white orchid) | ?/VU | - | 1987-1999 | 4 |
| *Pulicaria vulgaris* (small fleabane) | NR/CR | Sch. 8 | Pre-1970 | 1 |
| *Ranunculus arvensis* (corn buttercup) | ?/CR | - | 1987-1999 | 3 |
| *Ranunculus tripartitus* (three-lobed crowfoot) | NS/EN | - | 1987-1999 | 12 |
| *Rumex rupestris* (shore dock) | NS/EN | Sch. 8 | 1987-1999 | 3 |
| *Salsola kali subsp. kali* (prickly saltwort) | ?/VU | - | 1987-1999 | 31 |
| *Saxifraga cespitosa* (tufted saxifrage) | NR/EN | Sch. 8 | 1987-1999 | 1 |
| *Scandix pecten-veneris* (shepherd's needle) | ?/CR | - | 1987-1999 | 1 |
| *Scleranthus annuus* (annual knawel) | ?/EN | - | 1987-1999 | 35 |
| *Scleranthus annuus subsp. annuus* (an annual knawel) | ?/EN | - | 1987-1999 | - |
| *Silene gallica* (small-flowered catchfly) | NS/EN | - | 1987-1999 | 17 |
| *Sorbus eminens* (a whitebeam) | NR/EN | - | 1987-1999 | 4 |
| *Sorbus leptophylla* (a whitebeam) | NR/EN | - | 1987-1999 | 3 |
| *Sorbus leyana* (Ley's whitebeam) | NR/CR | - | 1987-1999 | 2 |
| *Sorbus minima* (a whitebeam) | NR/VU | - | 1987-1999 | 1 |
| *Stellaria palustris* (marsh stitchwort) | ?/VU | - | 1987-1999 | 5 |
| + *Trollius europaeus* (globe flower) | ?/LC | - | 1987-1999 | 64 |
| *Valerianella rimosa* (broad-fruited cornsalad) | NS/VU | - | Pre-1970 | 7 |
| + *Vicia orobus* (wood bitter-vetch) | NS/NT | - | 1987-1999 | 60 |
| *Viola lactea* (pale dog-violet) | NS/VU | - | 1987-1999 | 65 |
| *Woodsia ilvensis* (oblong woodsia) | NR/EN | Sch. 8 | 1987-1999 | 3 |

The *Guidelines for Selection of Biological SSSIs* (NCC, 1989) use a point scoring system to evaluate sites which support Schedule 8, Red Data Book or Nationally Scarce vascular plants. There is also guidance on selecting regionally and locally rare species, and species which are on the edge of their range or are shown to be dramatically declining. Some of the species in the following list fit into one or more of these categories. Many though can be loosely considered as locally or regionally rare. Further information is given inn the common standards monitoring guide for vascular plants available at http://www.jncc.gov.uk/pdf/CSM_vascular_plants.pdf

In an attempt to prioritise assessment the vascular plant resource of the counties of Carmarthenshire, Glamorgan and Monmouthshire, two lists were prepared, Bodé, G (2004). The first, a primary list containing species that are recorded in 15 or fewer hectads (10 km squares). The second, a contributory list, contains species recorded in 30 or fewer 10km squares. There were 371 primary species and 218 contributory species. Some subjective judgment was made so that declining species within UK and Europe were also included. All of the listed species were native or archeophytes and most were recorded in the most survey recent time period, 1987-1999, Preston *et al*, (2002). A site in this context can be considered as a 'Wells site' i.e. any movable 1km square, see Preston *et al*, (2002) for explanation.

Table 11 below is an amalgamation of these two lists from Bodé, G (2004) for ease of use. The two lists have been amalgamated with the selection priority status PS, primary status and *CS* contributory status in the final column. A slight adjustment has been made in moving 18 species from contributory status to primary status because of their conservation status [NT or above]. Therefore there are now 389 primary species and 200 contributory species.

This exercise can be undertaken for any local planning authority/LBAP area in Wales, except the Brecon Becons and Snowdonia National Park areas, using the compact disc supplied with the New Atlas of the British and Irish Flora (2003) and researching the species conservation status in Cheffing, C.M. & Farrell L. (Eds.) (2005) or within the species status listings on the JNCC website. This should be undertaken in association with the relevant recorder, and useful resources are available on the Botanical Society of the British Isles website www.**bsbi**.org.uk .

On this basis the following should be considered for selection:

- Any non-designated site with one or more primary species (PS) present
- Any non-designated site with 5 or more contributory species (CS) present
- Any non-designated site that supports populations of species listed as Nationally Scarce (NS), Nationally Rare (NR), Vulnerable (VU), Endangered (EN) or Critically Endangered (CR) in the Red Data Book (Cheffing, C.M. & Farrell L. (Eds.) 2005) or the Section 42 List with the specific requirement for site protection action (WAG 2008).
- Any non-designated site with a population of a contributory species (or other species not yet included on the list) that further research shows has suffered a significant decline nationally in subsequent years to warrant inclusion.

**Table 11 Primary Vascular Plant Species [PS] and Contributory Vascular Plant Species [*CS*] found in Carmarthenshire, Glamorgan, and Monmouthshire.**
[after Wales Assembly Government (2008)*,JNCC (20071217)[2] and Preston *et al*, 2002[3]]

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | Native/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Aconitum napellus sens. lat.* (monk's hood) | NS | 87-99 | N | 15 | PS |
| *Adiantum capillus-veneris* (maidenhair fern) | NS/LC | 87-99 | N | 5 | PS |
| *Agrimonia procera* (fragrant agrimony) | LC | 87-99 | N | 34 | *CS* |
| *Agrostemma githago* (corncockle) | W. list | 87-99 | A | 1 | PS |
| *Agrostis curtisii* (bristle bent) | LC | 87-99 | N | 13 | PS |
| *Alchemilla filicaulis subsp. filicaulis* (Ladies mantle) | LC | 87-99 | N | 5 | PS |
| *Alchemilla glabra* (a lady's-mantle) | LC | 87-99 | N | 34 | *CS* |
| *Alchemilla xanthochlora* (a lady's-mantle) | LC | 87-99 | N | 27 | *CS* |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Alisma lanceolatum* (narrow-leaved water-plantain) | LC | 87-99 | N | 13 | PS |
| *Allium ampeloprasum* (wild leek) | LC | 87-99 | A | 1 | PS |
| *Allium schoenoprasum* (chives) | LC | 87-99 | N | 1 | PS |
| *Alopecurus aequalis* (orange foxtail) | LC | 87-99 | N | 5 | PS |
| *Alopecurus bulbosus* (bulbous foxtail) | LC | 87-99 | N | 14 | PS |
| *Althaea hirsuta* (rough marsh mallow) | Schd. 8 | 87-99 | A | 1 | PS |
| *Althea officinalis* (marsh-mallow) | LC | 87-99 | N | 15 | *CS* |
| *Anacamptis morio* (green-winged orchid) | NT | 87-99 | N | 27 | PS |
| *Anacamptis pyramidalis* (pyramidal orchid) | LC | 87-99 | N | 27 | *CS* |
| *Anagallis arvensis subsp. foemina* (blue pimpernel) | LC | 87-99 | A | 2 | PS |
| *Anagallis minima* (chaffweed) | NT | 87-99 | N | 2 | PS |
| *Anchusa arvensis* (bugloss) | LC | 87-99 | A | 18 | *CS* |
| *Andromeda polifolia* (bog rosemary) | LC | 87-99 | N | 4 | PS |
| *Antennaria dioica* (mountain everlasting) | LC | 87-99 | N | 6 | PS |
| *Anthemis arvensis* (corn chamomile) | EN | 87-99 | A | 2 | PS |
| *Anthemis cotula* (stinking chamomile) | VU | 87-99 | A | 20 | PS |
| *Anthriscus caucalis* (bur-chervil) | LC | 87-99 | N | 3 | PS |
| *Apium graveolens* (wild celery) | LC | 87-99 | N | 23 | *CS* |
| *Apium inundatum* (lesser marshwort) | LC | 87-99 | N | 16 | *CS* |
| *Arabis glabra* (Tower mustard) | NS/EN | Pre-70 | N | 1 | PS |
| *Arenaria serpyllifolia subsp.leptoclados.* (thyme-lvd sandwort) | LC | 87-99 | N | 36 | *CS* |
| ***Artemisia campestris* (Field wormwood)** | **NR/VU*** | 87-99 | A | 1 | PS |
| *Arum italicum subsp. neglectum* (Italian cuckoopint) | NS/NT | 87-99 | N | 1 | PS |
| ***Asparagus officinalis subsp. prostratus*** | **NR/EN*** | 87-99 | N | 2 | PS |
| *Asperula cynanchica* (squinancywort) | LC | 87-99 | N | 13 | PS |
| *Asplenium marinum* (sea spleenwort) | LC | 87-99 | N | 11 | *CS* |
| *Asplenium obovatum* (lanceolate spleewort) | NS/NT | 87-99 | N | 2 | PS |
| *Asplenium trichomanes subsp.trichomanes* (mdnhair splnwrt) | LC | 87-99 | N | 17 | *CS* |
| *Asplenium viride* (green spleenwort) | LC | 87-99 | N | 12 | PS |
| *Aster linosyris* (goldilocks aster) | NR/LC | 87-99 | N | 1 | PS |
| *Astragalus glycophyllos* (wild liquorice) | LC | 87-99 | N | 5 | PS |
| *Atriplex glabriuscula* (Babington's orache) | LC | 87-99 | N | 15 | *CS* |
| *Atriplex laciniata* (frosted orache) | LC | 87-99 | N | 11 | *CS* |
| *Atriplex longipes* (long-stalked orache) | NS/LC | 87-99 | N | 6 | PS |
| *Atriplex littoralis* (grass-leaved orache) | LC | 87-99 | N | 12 | *CS* |
| *Atriplex portulacoides* (sea-purslane) | LC | 87-99 | N | 18 | *CS* |
| *Atropa belladonna* (deadly nightshade) | LC | 87-99 | N | 2 | PS |
| *Baldellia ranunculoides* (lesser water-plantain) | NT | 87-99 | N | 8 | PS |
| *Ballota nigra* (black horehound) | LC | 87-99 | A | 32 | *CS* |
| *Berberis vulgaris* (barberry) | LC | 87-99 | N | 17 | *CS* |
| *Bidens cernua* (nodding bur-marigold) | LC | 87-99 | N | 25 | *CS* |
| *Blackstonia perfoliata* (yellow-wort) | LC | 87-99 | N | 32 | *CS* |
| ***Blysmus compressus* (flat sedge)** | **VU*** | 87-99 | N | 1 | PS |
| *Blysmus rufus* (saltmarsh flat sedge) | LC | 87-99 | N | 1 | PS |
| *Botrichium lunaria* (moonwort) | LC | 87-99 | N | 25 | *CS* |
| *Brachypodium pinnatum* (tor-grass) | - | 87-99 | N | 6 | PS |
| *Brassica oleracea* (wild cabbage) | NS | 87-99 | N | 8 | PS |
| *Bromopsis erecta* (upright brome) | LC | 87-99 | N | 24 | *CS* |
| *Bromus commutatus* (meadow brome) | LC | 87-99 | N | 17 | *CS* |
| *Bromus hordeaceus subsp. ferronii* (soft brome) | NS/LC | 87-99 | N | 7 | PS |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Bromus hordeaceus subsp. thominei* (soft brome) | NS/LC | 87-99 | N | 5 | PS |
| *Bromus hordeaceus x B. lepidus* (soft brome) | - | 87-99 | A | 9 | PS |
| *Bromus racemosus* (smooth brome) | LC | 87-99 | N | 27 | *CS* |
| *Bromus secalinus* (rye brome) | NS/VU | 87-99 | A | 3 | PS |
| *Bryonia dioica* (white bryony) | LC | 87-99 | N | 23 | *CS* |
| ***Bupleurum tenuissimum* (slender hare's-ear)** | **NS/VU*** | 87-99 | N | 5 | PS |
| *Butomus umbellatus* (flowering rush) | LC | 87-99 | N | 9 | PS |
| *Cakile maritima* (sea rocket) | LC | 87-99 | N | 14 | *CS* |
| *Callitriche brutia* (pedunculate water-starwort) | LC | 87-99 | N | 11 | PS |
| *Callitriche obtusangula* (blunt-fruited water-satrwort) | LC | 87-99 | N | 22 | *CS* |
| *Callitriche platycarpa* (various-leaved water-starwort) | LC | 87-99 | N | 25 | *CS* |
| *Calystegia soldanella* (sea bindweed) | LC | 87-99 | N | 13 | *CS* |
| *Campanula glomerata* (clustered bellflower) | LC | 87-99 | N | 3 | PS |
| *Campanula latifolia* (giant bellflower) | LC | 87-99 | N | 12 | PS |
| ***Campanula patula* (spreading bellflower)** | **NS/EN*** | 87-99 | N | 7 | PS |
| *Campanula trachelium* (nettle-leaved bellflower) | LC | 87-99 | N | 11 | PS |
| *Carduus tenuiflorus* (slender thistle) | LC | 87-99 | N | 17 | *CS* |
| *Carex acuta* (slender tufted-sedge) | LC | 87-99 | N | 7 | PS |
| *Carex aquatilis* (water sedge) | LC | 87-99 | N | 6 | PS |
| *Carex diandra* (lesser tussock sedge) | NT | Pre-70 | N | 2 | PS |
| *Carex digitata* (fingered sedge) | NS/LC | 87-99 | N | 3 | PS |
| *Carex dioica* (dioecious sedge) | LC | 87-99 | N | 7 | PS |
| *Carex distans* (distant sedge) | LC | 87-99 | N | 11 | PS |
| *Carex disticha* (brown sedge) | LC | 87-99 | N | 22 | *CS* |
| ***Carex divisa* (divided sedge)** | **NS/VU** | 87-99 | N | 1 | PS |
| *Carex divulsa subsp. leersii* (grey sedge) | LC | 87-99 | N | 3 | PS |
| *Carex elata* (tufted sedge) | LC | 87-99 | N | 3 | PS |
| *Carex elongata* (elongated sedge) | NS/LC | 87-99 | N | 1 | PS |
| *Carex extensa* (long-bracted sedge) | LC | 87-99 | N | 15 | *CS* |
| *Carex humilis* (dwarf sedge) | NS/LC | 87-99 | N | 1 | PS |
| *Carex lasiocarpa* (slender sedge) | LC | 87-99 | N | 1 | PS |
| *Carex limosa* (bog sedge) | LC | 87-99 | N | 2 | PS |
| *Carex montana* (soft-leaved sedge) | NS/LC | 87-99 | N | 18 | *CS* |
| *Carex pseudocyperus* (cyperus sedge) | LC | 87-99 | N | 14 | *CS* |
| *Carex punctata* (dotted sedge) | NS/LC | 87-99 | N | 3 | PS |
| *Carex rostrata x C. vesicaria* (bottle sedge) | - | 87-99 | N | 2 | PS |
| *Carex strigosa* (thin-spiked sedge) | LC | 87-99 | N | 21 | *CS* |
| *Carex vesicaria* (bladder sedge) | LC | 87-99 | N | 26 | *CS* |
| *Carex viridula subsp. brachyrrhyncha* | LC | 87-99 | N | 19 | *CS* |
| *Carex viridula subsp. viridula* (small fruited yellow sedge) | LC | 87-99 | N | 8 | PS |
| *Catabrosa aquatica* (whorl-grass) | LC | 87-99 | N | 9 | PS |
| *Centaurea scabiosa* (greater knapweed) | LC | 87-99 | N | 38 | *CS* |
| *Centaurium littorale* (seaside centaury) | LC | 87-99 | N | 4 | PS |
| *Centaurium pulchellum* (lesser centaury) | LC | 87-99 | N | 14 | *CS* |
| *Cephalanthera damasonium* (white helleborine) | VU | 87-99 | N | 2 | PS |
| ***Cephalanthera longifolia* (narrow-leaved helleborine)** | **NS/VU*** | 87-99 | N | 1 | PS |
| *Ceratocapnos claviculata* (climbing corydalis) | LC | 87-99 | N | 37 | *CS* |
| *Ceratophyllum demersum* (rigid hornwort) | LC | 87-99 | N | 21 | *CS* |
| *Ceratophyllum submersum* (soft hornwort) | LC | 87-99 | N | 8 | PS |
| ***Chamaemelum nobile* (chamomile)** | **VU*** | 87-99 | N | 3 | PS |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Chenopodium bonus-henricus* (good-king-Henry) | VU | 87-99 | A | 22 | PS |
| *Chenopodium glaucum* (oak-leaved goosefoot) | NS/VU | 87-99 | A | 1 | PS |
| *Chenopodium hybridum* (maple-leaved goosefoot) | LC | 87-99 | A | 3 | PS |
| *Chenopodium murale* (nettle-leaved goosefoot) | VU | 87-99 | A | 3 | PS |
| *Chrysanthemum segetum* (corn marigold) | VU | 87-99 | A | 36 | PS |
| *Chrysosplenium alternifolium* (alt.-leaved golden-saxifrage) | LC | 87-99 | N | 24 | *CS* |
| *Circaea alpina* (alpine enchanters-nightshade) | LC | 87-99 | N | 1 | PS |
| *Circaea alpina x C. lutetiana* | - | 87-99 | N | 15 | *CS* |
| *Cirsium acaule* (dwarf thistle) | LC | 87-99 | N | 18 | *CS* |
| *Cirsium eriophorum* (woolly thistle) | LC | 87-99 | N | 16 | *CS* |
| *Cirsium tuberosum* (tuberous thistle) | NR/NT | 87-99 | N | 3 | PS |
| *Cladium mariscus* (great fen-sedge) | LC | 87-99 | N | 3 | PS |
| ***Clinopodium acinos* (basil thyme)** | **VU*** | 87-99 | N | 6 | PS |
| *Clinopodium ascendens* (common calamint) | LC | 87-99 | N | 12 | PS |
| *Clinopodium calamintha* (lesser calamint) | NS/VU | 87-99 | N | 3 | PS |
| *Coincya monensis subsp. monensis* (Isle of Man cabbage) | NS/LC | 87-99 | N | 2 | PS |
| ***Coeloglossum viride* (frog orchid)** | **VU*** | 87-99 | N | 6 | PS |
| *Colchicum autumnale* (meadow saffron) | NT | 87-99 | N | 12 | PS |
| *Convallaria majalis* (lily-of-the-valley) | LC | 87-99 | N | 9 | PS |
| *Crambe maritima* (sea-kale) | LC | Pre-70 | N | 9 | *CS* |
| *Crataegus laevigata* (Midland hawthorn) | LC | 87-99 | N | 1 | PS |
| *Crepis biennis* (rough hawk's-beard) | LC | 87-99 | N | 1 | PS |
| *Crepis paludosa* (marsh hawk's-beard) | LC | 87-99 | N | 4 | PS |
| *Cryptogramma crispa* (parsley fern) | LC | 87-99 | N | 7 | PS |
| *Cuscuta epithymum* (dodder) | VU | Pre-70 | N | 5 | PS |
| *Cynoglossum germanicum* (green hound's-tongue) | NS/CR/8 | Pre-70 | N | 2 | PS |
| *Cynoglossum officinale* (hound's tongue) | NT | 87-99 | N | 13 | PS |
| *Cyperus longus* (galingale) | NS/NT | 87-99 | N | 1 | PS |
| *Cystopteris fragilis* (brittle bladder-fern) | LC | 87-99 | N | 25 | *CS* |
| *Dactylorhiza incarnata* (early marsh-orchid) | LC | 87-99 | N | 27 | *CS* |
| *Dactylorhiza purpurella* (northern marsh-orchid) | LC | 87-99 | N | 17 | *CS* |
| *Daphne laureola* (spurge laurel) | LC | 87-99 | N | 16 | *CS* |
| *Daphne mezereum* (mezereon) | NS/VU | 87-99 | N | 2 | PS |
| *Daucus carota subsp. gummifer* (sea carrot) | NS/LC | 87-99 | N | 8 | *CS* |
| *Descurainia sophia* (flixweed) | LC | 87-99 | A | 3 | PS |
| ***Dianthus armeria* (Deptford pink)** | **NS/EN*/8** | 87-99 | N | 3 | PS |
| *Diphasiastrum alpinum* (alpine club-moss) | LC | 87-99 | N | 2 | PS |
| *Diplotaxis tenuifolia* (perennial wall-rocket) | LC | 87-99 | A | 24 | *CS* |
| *Dipsacus pilosus* (small teasel) | LC | 87-99 | N | 8 | PS |
| *Draba aizoides* (yellow whitlowgrass) | NR/NT | 87-99 | N | 2 | PS |
| *Drosera anglica* (great sundew) | NT | Pre-70 | N | 1 | PS |
| *Drosera intermedia* (oblong-leaved sundew) | LC | 87-99 | N | 6 | PS |
| *Dryopteris aemula* (hay-scented buckler-fern) | LC | 87-99 | N | 12 | PS |
| *Dryopteris expansa* (northern buckler-fern) | LC | 70-86 | N | 1 | PS |
| *Dryopteris oreades* (mountain male-fern) | LC | 87-99 | N | 5 | PS |
| *Dryopteris submontana* (rigid buckler-fern) | NS/LC | 70-86 | N | 1 | PS |
| *Echium vulgare* (viper's bugloss) | LC | 87-99 | N | 36 | *CS* |
| *Elatine hexandra* (six-stamened waterwort) | LC | 87-99 | N | 4 | PS |
| *Eleocharis acicularis* (needle spike rush) | LC | 70-86 | N | 1 | PS |
| *Eleocharis multicaulis* (many-stalked spike-rush) | LC | 87-99 | N | 29 | *CS* |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Eleocharis quinqueflora* (few-flowered spike-rush) | LC | 87-99 | N | 26 | *CS* |
| *Eleocharis uniglumis* (slender spike-rush) | LC | 87-99 | N | 16 | PS |
| *Eleogiton fluitans* (floating club-rush) | LC | 87-99 | N | 19 | *CS* |
| *Elytrigia juncea* (sand couch) | LC | 87-99 | N | 18 | *CS* |
| *Elytrigia juncea x E. repens* | - | 87-99 | N | 2 | *CS* |
| *Empetrum nigrum* (crowberry) | LC | 87-99 | N | 26 | *CS* |
| *Epilobium montanum x E. obscurum* | - | 87-99 | N | 1 | PS |
| *Epilobium montanum x E. parviflorum* | - | 87-99 | N | 1 | PS |
| *Epipactis leptochila* (narrow-lipped helleborine) | NS/DD | 87-99 | N | 2 | PS |
| *Epipactis palustris* (marsh helleborine) | LC | 87-99 | N | 23 | *CS* |
| *Epipactis phyllanthes* (green-flowered helleborine) | NS/LC | 87-99 | N | 3 | PS |
| *Equisetum arvense x E. fluviatile* | - | 87-99 | N | 9 | PS |
| *Equisetum hyemale* (rough horsetail) | LC | 87-99 | N | 7 | PS |
| *Eriophorum gracile* (slender cotton-sedge) | NR/NT/8 | 87-99 | N | 2 | PS |
| *Eriophorum latifolium* (broad-leaved cotton-sedge) | LC | 87-99 | N | 14 | PS |
| *Erodium lebelii* (sticky stork's bill) | NS/LC | 87-99 | N | 4 | PS |
| *Erodium maritimum* (sea stork's-bill) | LC | 87-99 | N | 13 | *CS* |
| *Erodium moschatum* (musk stork's-bill) | LC | 87-99 | A | 7 | PS |
| *Erophila glabrescens* (whitlow grass) | LC | 87-99 | N | 6 | PS |
| *Erophila majuscula* (hairy whitlow grass) | LC | 87-99 | N | 2 | PS |
| *Eryngium maritimum* (sea-holly) | LC | 87-99 | N | 13 | *CS* |
| *Erysimum cheiranthoides* (treacle mustard) | LC | 87-99 | A | 11 | PS |
| *Euphorbia amygdaloides* (wood spurge) | LC | 87-99 | N | 31 | *CS* |
| *Euphorbia exigua* (dwarf spurge) | NT | 87-99 | A | 13 | PS |
| *Euphorbia paralias* (sea spurge) | LC | 87-99 | N | 14 | *CS* |
| *Euphorbia platyphyllos* (broad-leaved spurge) | LC | 70-86 | A | 2 | PS |
| *Euphorbia serrulata* (upright spurge) | LC | 87-99 | N | 6 | PS |
| ***Euphrasia anglica* (glandular eyebright)** | **EN*** | 87-99 | N | 19 | PS |
| *Euphrasia arctica subsp. borealis* (an eyebright) | DD | 87-99 | N | 20 | *CS* |
| *Euphrasia arctica x E. confusa* | - | 87-99 | N | 2 | PS |
| *Euphrasia confusa* (an eyebright) | DD | 87-99 | N | 22 | *CS* |
| *Euphrasia confusa x E. nemorosa* | - | 87-99 | N | 12 | PS |
| *Euphrasia confusa x E. scottica* | - | 87-99 | N | 5 | PS |
| *Euphrasia micrantha* (an eyebright) | DD | 87-99 | N | 5 | PS |
| ***Euphrasia pseudokerneri* (Chalk eyebright)** | **NS/EN*** | 87-99 | N | 1 | PS |
| ***Euphrasia rostkoviana subsp. montana* (an eyebright)** | **NS/VU*** | 87-99 | N | 2 | PS |
| *Euphrasia rostkoviana subsp.rostkoviana* (tall eyebright) | VU | 87-99 | N | 26 | PS |
| *Euphrasia scottica* (an eyebright) | LC | 87-99 | N | 5 | PS |
| *Euphrasia tetraquetra* (an eyebright) | DD | 87-99 | N | 11 | PS |
| *Festuca altissima* (wood fescue) | LC | 87-99 | N | 6 | PS |
| *Festuca arenaria* (rush-leaved fescue) | NS | 87-99 | N | 3 | PS |
| *Festuca filiformis* (fine-leaved sheep's-fescue) | LC | 87-99 | N | 3 | PS |
| *Festuca lemanii* (confused fescue) | LC | 87-99 | N | 1 | PS |
| *Festuca vivipara* (viviparous sheep's-fescue) | LC | 87-99 | N | 1 | PS |
| *Filago minima* (small cudweed) | LC | 87-99 | N | 30 | *CS* |
| *Filago vulgaris* (common cudweed) | NT | 87-99 | N | 9 | PS |
| *Filipendula vulgaris* (dropwort) | LC | 87-99 | N | 3 | PS |
| *Frangula alnus* (alder buckthorn) | LC | 87-99 | N | 31 | *CS* |
| *Frankenia laevis* (sea-heath) | NS/NT | 87-99 | A | 2 | PS |
| *Fumaria bastardii* (tall ramping-fumitory) | LC | 87-99 | N | 17 | *CS* |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Fumaria capreolata babbingtonii* (white ramping-fumitory) | LC | 87-99 | N | 15 | *CS* |
| ***Fumaria purpurea* (purple ramping-fumitory)** | **NS/LC*** | 87-99 | N | 1 | PS |
| *Fumaria vaillantii* (few flowered fumitory) | NS/VU | 87-99 | A | 1 | PS |
| *Gagea lutea* (yellow star-of-Bethlehem) | LC | 87-99 | N | 1 | PS |
| ***Galeopsis angustifolia* (narrow-leaved hemp-nettle)** | **NS/CR*** | 87-99 | A | 2 | PS |
| *Galium mollugo x G. verum* | - | 87-99 | N | 1 | PS |
| *Galium parisiense* (wall bedstraw) | NS/VU | Pre-70 | N | 1 | PS |
| *Galium sterneri* (limestone bedstraw) | LC | 87-99 | N | 6 | PS |
| *Galium uliginosum* (fen bedstraw) | LC | 87-99 | N | 31 | *CS* |
| *Gastridium ventricosum* (nit-grass) | LC | 87-99 | N | 3 | PS |
| *Gaudinia fragilis* (French oat-grass) | NS/LC | 87-99 | N | 1 | PS |
| *Genista pilosa* (hairy greenweed) | NR/NT | 87-99 | N | 1 | PS |
| ***Gentianella anglica* (early gentian)** | ***; S.8** | Pre-70 | N | 1 | PS |
| *Gentianella amarella* (autumn gentian) | LC | 87-99 | N | 23 | *CS* |
| ***Gentianella campestris* (field gentian)** | **VU*** | 70-86 | N | 1 | PS |
| ***Gentianella uliginosa* (dune gentian)** | **VU*** | 87-99 | N | 4 | PS |
| *Geranium pratense* (meadow crane's-bill) | LC | 87-99 | N | 30 | *CS* |
| *Geranium purpureum* (little robin) | LC | Pre-70 | N | 2 | PS |
| *Geranium pusillum* (small-flowered crane's-bill) | LC | 87-99 | N | 23 | *CS* |
| *Geranium rotundifolium* (round-leaved crane's-bill) | LC | 87-99 | N | 11 | *CS* |
| *Geranium sanguineum* (bloody crane's-bill) | LC | 87-99 | N | 11 | PS |
| *Geranium sylvaticum* (wood crane's-bill) | LC | 87-99 | A | 2 | PS |
| *Geum rivale* (water avens) | LC | 87-99 | N | 31 | *CS* |
| *Geum rivale x G. urbanum* | - | 87-99 | N | 14 | PS |
| *Glaucium flavum* (yellow horned-poppy) | LC | 87-99 | N | 9 | *CS* |
| *Gnaphalium sylvaticum* (heath cudweed) | EN | 87-99 | N | 2 | PS |
| *Groenlandia densa* (opposite-leaved pondweed) | VU | 70-86? | N | 2 | PS |
| ***+Gymnadenia conopsea* (fragrant orchid)** | **LC*** | 87-99 | N | 20 | PS |
| *Gymnocarpium dryopteris* (oak fern) | LC | 87-99 | N | 14 | *CS* |
| *Gymnocarpium robertianum* (limestone fern) | NS/LC | 87-99 | N | 8 | PS |
| ***+Hammarbya paludosa* (bog orchid)** | **LC+** | 87-99 | N | 2 | PS |
| *Helianthemum nummularium* (rock-rose) | LC | 87-99 | N | 23 | *CS* |
| *Helianthemum oelandicum* (hoary rock-rose) | LC | 87-99 | N | 4 | PS |
| *Helictotrichon pratense* (meadow oat-grass) | LC | 87-99 | N | 7 | PS |
| *Helleborus foetidus* (stinking hellebore) | NS/LC | 87-99 | N | 9 | *CS* |
| *Helleborus viridis (*green hellebore) | LC | 87-99 | N | 8 | *CS* |
| *Herminium monorchis* (musk orchid) | NS/VU | Pre-70 | N | 2 | PS |
| ***+Hieracium radycense* (Radyr hawkweed)** | **NR/CR*** | 87-99 | N | 1 | PS |
| *Hippocrepis comosa* (horseshoe vetch) | LC | 87-99 | N | 7 | PS |
| *Hippuris vulgaris* (mare's-tail) | LC | 87-99 | N | 14 | *CS* |
| *Honkenya peploides* (sea sandwort) | LC | 87-99 | N | 16 | *CS* |
| *Hordelymus europaeus* (wood barley) | NS/LC | 87-99 | N | 4 | PS |
| ***Hordeum marinum* (sea barley)** | **NS/VU*** | 87-99 | N | 6 | PS |
| *Hordeum secalinum* (meadow barley) | LC | 87-99 | N | 31 | *CS* |
| *Hornungia petraea* (hutchinsia) | NS/LC | 87-99 | N | 11 | PS |
| *Hottonia palustris* (water violet) | LC | 87-99 | N | 1 | PS |
| *Huperzia selago* (fir clubmoss) | LC | 87-99 | N | 12 | PS |
| *Hydrocharis morsus-ranae* (frogbit) | VU | 87-99 | N | 8 | PS |
| *Hymenophyllum tunbrigense* (Tonbridge filmy-fern) | LC | 87-99 | N | 5 | PS |
| *Hymenophyllum wilsonii* (Wilson's filmy-fern) | NT | 87-99 | N | 11 | PS |

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|---|---|---|---|---|---|
| *Hyoscyamus niger* (henbane) | VU | 87-99 | A | 8 | PS |
| *Hypericum hirsutum* (hairy st John's-wort) | LC | 87-99 | N | 26 | *CS* |
| *Hypericum montanum* (pale St John's-wort) | NT | 87-99 | N | 8 | PS |
| *Hypochoeris glabra* (smooth cat's-ear) | VU | 87-99 | N | 3 | PS |
| *Inula crithmoides* (golden samphire) | NS/LC | 87-99 | N | 13 | *CS* |
| *Inula helenium* (elecampane) | LC | 87-99 | N | 21 | *CS* |
| *Iris foetidissima* (stinking iris) | LC | 87-99 | N | 27 | *CS* |
| *Isoetes echinospora* (spring quillwort) | LC | 87-99 | N | 2 | *CS* |
| *Isoetes lacustris* (quillwort) | LC | 87-99 | N | 2 | PS |
| *Isolepis cernua (*slender club-rush) | LC | 87-99 | N | 14 | *CS* |
| *Juncus acutus* (sharp rush) | LC | 87-99 | N | 11 | *CS* |
| *Juncus ambiguus* (frog rush) | LC | 87-99 | N | 6 | PS |
| *Juncus compressus* (round-fruited rush) | NT | 87-99 | N | 2 | PS |
| *Juncus foliosus* (leafy rush) | LC | 87-99 | N | 9 | *CS* |
| *Juncus subnodulosus* (blunt-flowered rush) | LC | 87-99 | N | 22 | *CS* |
| ***Juniperus communis* (common juniper)** | **LC*** | 87-99 | N | 3 | PS |
| *Kickxia elatine* (sharp-leaved fluellen) | LC | 87-99 | A | 26 | *CS* |
| *Kickxia spuria* (round-leaved fluellen) | LC | 87-99 | A | 5 | PS |
| *Koeleria macrantha* (crested hair-grass) | LC | 87-99 | N | 20 | *CS* |
| *Lactuca virosa* (great lettuce) | LC | 87-99 | N | 9 | PS |
| *Lamium amplexicaule* (henbit dead-nettle) | LC | 87-99 | A | 13 | *CS* |
| *Lamium hybridum* (cut-leaved dead-nettle) | LC | 87-99 | A | 12 | *CS* |
| *Lathraea squamaria* (toothwort) | LC | 87-99 | N | 24 | *CS* |
| *Lathyrus aphaca* (yellow vetchling) | NS/VU | Pre-70 | N | 1 | PS |
| *Lathyrus japonicus* (sea pea) | NS/LC | Pre-70 | N | 1 | PS |
| *Lathyrus nissolia* (grass vetchling) | LC | 87-99 | N | 15 | *CS* |
| *Lathyrus palustris* (marsh pea) | NS/NT | 87-99 | N | 2 | PS |
| *Lathyrus sylvestris* (narrow-leaved everlasting-pea) | LC | 87-99 | N | 20 | *CS* |
| *Lavatera arborea (*tree-mallow) | LC | 87-99 | N | 11 | *CS* |
| *Lemna gibba* (fat duckweed) | LC | 87-99 | N | 11 | *CS* |
| *Lemna trisulca* (ivy-leaved duckweed) | LC | 87-99 | N | 18 | *CS* |
| *Lepidium heterophyllum* (Smith's pepperwort) | LC | 87-99 | N | 36 | *CS* |
| *Lepidium latifolium* (dittander) | NS/LC | 87-99 | N | 1 | PS |
| *Leymus arenarius* (lyme-grass) | LC | 87-99 | N | 9 | *CS* |
| *Limonium binervosum agg.* (rock sea-lavender) | LC | 87-99 | N | 19 | *CS* |
| *Limonium humile* (lax-flowered sea lavender) | LC | 87-99 | N | 1 | PS |
| *Limonium procerum subsp. procerum* (rock sea lavender) | - | 87-99 | N | 1 | PS |
| *Limonium vulgare* (common sea-lavender) | LC | 87-99 | N | 14 | *CS* |
| *Limosella aquatica* (mudwort) | LC | Pre-70 | N | 4 | PS |
| *Limosella australis* (Welsh mudwort) | NR; S. 8 | Pre-70 | N | 1 | PS |
| *Linum bienne* (pale flax) | LC | 87-99 | N | 18 | *CS* |
| ***Liparis loeselii* (fen orchid)** | **NR/EN*S8** | 87-99 | N | 4 | PS |
| *Lithospermum arvense* (field gromwell) | EN | 87-99 | A | 2 | PS |
| *Lithospermum officinalis* (gromwell) | LC | 87-99 | N | 15 | *CS* |
| *Lithospermum purpurocaeruleum* (purple gromwell) | NS/LC | 87-99 | N | 3 | PS |
| *Littorella uniflora* (shoreweed) | LC | 87-99 | N | 17 | *CS* |
| *Lobelia dortmanna* (water lobelia) | LC | 87-99 | N | 1 | PS |
| *Lobelia urens* (heath lobelia) | NR/VU | Pre-70 | N | 1 | PS |
| *Lolium temulentum* (darnel)Ψ | NR/CR | 87-99 | A | 3 | PS |
| *Lotus glaber* (narrow-leaved bird's-foot trefoil) | LC | 87-99 | N | 5 | PS |

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|---|---|---|---|---|---|
| ***Luronium natans* (floating water-plantain)** | **NS/LC+S8** | 70-86 | N | 1 | PS |
| *Luzula forsteri* (southern wood rush) | LC | 87-99 | N | 9 | PS |
| *Luzula forsteri x L. pilosa* | - | 87-99 | N | 1 | PS |
| *Lycopodium clavatum* (stag's-horn club-moss) | **LC*** | 87-99 | N | 6 | PS |
| *Lysimachia thryssifolia* (tufted loosestrife) | NS/LC | 87-99 | N? | 1 | PS |
| *Lythrum hyssopifolia* (grass-poly)Ψ | **NR/EN;S8** | 87-99 | A | 1 | PS |
| *Malva neglecta* (dwarf mallow) | LC | 87-99 | A | 20 | *CS* |
| *Marrubium vulgare* (white horehound) | NS/LC | 87-99 | N | 6 | PS |
| ***Matthiola sinuata* (sea stock)** | **NR/VU*** | 87-99 | N | 6 | PS |
| *Mecanopsis cambrica* (Welsh poppy) | NS/LC | 87-99 | N | 7 | PS |
| *Medicago arabica* (spotted medick) | LC | 87-99 | N | 23 | *CS* |
| *Medicago polymorpha* (toothed medick) | NS/LC | 87-99 | N | 1 | PS |
| *Melica nutans* (mountain melic) | LC | 87-99 | N | 6 | PS |
| ***Melittis melissophyllum* (bastard balm)** | **NS/VU*** | 87-99 | N | 2 | PS |
| ***Mentha pulegium* (pennyroyal)** | **NS/EN*S8** | 87-99 | A | 3 | PS |
| *Mentha suaveolens* (round-leaved mint) | NS/DD | 87-99 | N | 7 | PS |
| *Mercurialis annua* (annual mercury) | LC | 87-99 | A | 19 | *CS* |
| *Mibora minima* (early sand-grass) | NR/LC | 87-99 | N | 1 | PS |
| *Minuartia hybrida* (fine-leaved sandwort)Ψ | NS/EN | 87-99 | N | 1 | PS |
| *Misopates orontium* (weasel's-snout) | VU | 87-99 | A | 8 | PS |
| *Moenchia erecta* (upright chickweed) | LC | 87-99 | N | 7 | PS |
| ***Monotropa hypopitys* (yellow bird's-nest)** | **EN*;S8** | 87-99 | N | 8 | PS |
| *Myosotis ramosissima* (changing forget-me-not) | LC | 87-99 | N | 31 | *CS* |
| *Myosoton aquaticum* (water chickweed) | LC | 87-99 | N | 24 | *CS* |
| *Myrica gale* (bog myrtle) | LC | 87-99 | N | 12 | PS |
| *Myriophyllum alternifolium* (alternate water-milfoil) | LC | 87-99 | N | 28 | *CS* |
| *Myriophyllum spicatum* (spiked water-milfoil) | LC | 87-99 | N | 28 | *CS* |
| *Myriophyllum verticillatum* (whorled water-milfoil) | VU | 87-99 | N | 1 | PS |
| *Narcissus pseudonarcissus subsp. pseud.* (wild daffodil) | LC | 87-99 | N | 21 | *CS* |
| *Neottia nidus-avis* (bird's-nest orchid) | NT | 87-99 | N | 17 | PS |
| *Nuphar lutea* (yellow water-lily) | LC | 87-99 | N | 15 | *CS* |
| *Nymphaea alba* (white waterlily) | LC | 87-99 | N | 31 | *CS* |
| *Oenanthe aquatica* (fine-leaved water-dropwort) | LC | 87-99 | N | 9 | PS |
| ***Oenanthe fistulosa* (tubular water-dropwort)** | **VU*** | 87-99 | N | 18 | PS |
| *Oenanthe lachenallii* (parsley water-dropwort) | LC | 87-99 | N | 25 | *CS* |
| *Oenanthe pimpinelloides* (corky-fruited water-dropwort) | LC | 87-99 | N | 1 | PS |
| *Ononis reclinata* (small restharrow) | NR; S.8 | 87-99 | N | 2 | PS |
| *Ononis spinosa* (prickly restharrow) | LC | 87-99 | N | 12 | *CS* |
| *Ophrys apifera* (bee orchid) | LC | 87-99 | N | 28 | *CS* |
| ***Ophrys insectifera* (fly orchid)** | **VU*** | 87-99 | N | 1 | PS |
| ***Orchis ustulata* (burnt tip orchid)** | **EN*** | 87-99 | N | 1 | PS |
| *Ornithogalum pyranaicum* (spiked star-of-Bethlehem) | NS/LC | 87-99 | A | 1 | PS |
| *Ornithopus purpusillus* (bird's-foot) | LC | 87-99 | N | 29 | *CS* |
| *Orobanche elatior* (knapweed broomrape) | LC | Pre-70 | N | 5 | PS |
| *Orobanche hederae* (ivy broomrape) | LC | 87-99 | N | 16 | *CS* |
| *Orobanche minor* (carrot broomrape) | LC | 87-99 | N | 30 | *CS* |
| *Orobanche purpurea* (yarrow broomrape) | VU | Pre-70 | N | 1 | PS |
| *Orobanche rapum-genistae* (greater broomrape) | NS/NT | 87-99 | N | 9 | PS |
| *Orthilia secunda* (serrated wintergreen) | LC | Pre-70 | N | 2 | PS |
| *Osmunda regalis* (royal fern) | LC | 87-99 | N | 37 | *CS* |

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|---|---|---|---|---|---|
| *Paeonia mascula* (peony) | - | 87-99 | A | 1 | PS |
| *Papaver argemone* (prickly poppy) | VU | 87-99 | A | 2 | PS |
| *Papaver dubium subsp. lecoqii* (long-headed poppy) | LC | 87-99 | A | 11 | *CS* |
| *Papaver hybridum* (rough poppy) | LC | 87-99 | A | 1 | PS |
| *Parapholis incurva* (curved hard-grass) | NS/LC | 87-99 | N | 1 | PS |
| *Parapholis strigosa* (hard-grass) | LC | 87-99 | N | 18 | *CS* |
| *Parentucellia viscosa* (yellow bartsia) | LC | 87-99 | N | 4 | PS |
| *Paris quadrifolia* (herb paris) | LC | 87-99 | N | 26 | *CS* |
| *Parnassia palustris* (grass of Parnassus) | LC | Pre-70 | N | 2 | PS |
| *Pedicularis sylvatica subsp. hibernica* (lousewort) | NS/LC | 87-99 | N | 15 | *CS* |
| *Persicaria minor* (small water-pepper) | LC | 87-99 | N | 3 | PS |
| *Persicaria mitis* (tasteless water-pepper) | NS/VU | 87-99 | N | 1 | PS |
| *Petrorhagia nanteuilii* (childing pink) | NR/VU;S8 | 87-99 | A | 1 | PS |
| *Petroselinum segetum* (corn parsley) | LC | 87-99 | N | 10 | *CS* |
| *Phegopteris connectilis* (beech fern) | LC | 87-99 | N | 22 | *CS* |
| *Phleum arenarium* (sand cat's-tail) | LC | 87-99 | N | 16 | *CS* |
| *Picris hieracioides* (hawkweed oxtongue) | LC | 87-99 | N | 38 | *CS* |
| ***Pilularia globulifera*** **(pillwort)** | **NR/NT*S8** | 87-99 | N | 1 | PS |
| *Pimpinella major* (greater burnet-saxifrage) | LC | 70-86 | N | 1 | PS |
| *Pinguicula vulgaris* (butterwort) | LC | 87-99 | N | 31 | *CS* |
| *Plantago media* (hoary plantain) | LC | 87-99 | N | 25 | *CS* |
| ***Platanthera bifolia*** **(lesser butterfly-orchid)** | **VU*** | 87-99 | N | 16 | PS |
| *Platanthera chlorantha* (greater butterfly-orchid) | NT | 87-99 | N | 32 | PS |
| *Poa angustifolia* (narrow-leaved meadow-grass) | LC | 87-99 | N | 8 | PS |
| *Poa bulbosa* (bulbous meadow-grass) | NS/LC | 87-99 | N | 2 | PS |
| *Polygonatum multiflorum* (Solomon's-seal) | LC | 87-99 | N | 12 | PS |
| *Polygonatum odoratum* (angular Solomon's-seal) | NS/LC | 87-99 | N | 2 | PS |
| *Polygonum oxyspermum* (Ray's knotgrass) | LC | 87-99 | N | 6 | PS |
| *Polypodium cambricum* (southern polypody) | LC | 87-99 | N | 25 | *CS* |
| *Populus nigra subsp. betulifolia* | LC | 87-99 | N | 22 | *CS* |
| *Potamogeton alpinus* (red pondweed) | LC | 87-99 | N | 1 | PS |
| *Potamogeton coloratus* (fen pondweed) | NS/LC | 87-99 | N | 1 | PS |
| *Potamogeton gramineus* (various leaved pondweed) | LC | 87-99 | N | 1 | PS |
| *Potamogeton gramineus x P. lucens* | - | 87-99 | N | 1 | PS |
| *Potamogeton gramineus x P. perfoliatus* | - | 87-99 | N | 1 | PS |
| *Potamogeton lucens* (shining pondweed) | LC | 87-99 | N | 2 | PS |
| *Potamogeton lucens x P. perfoliatus* | - | Pre-70 | N | 1 | PS |
| *Potamogeton obtusifolius* (blunt-leaved pondweed) | LC | 87-99 | N | 6 | PS |
| *Potamogeton pectinatus* (fennel pondweed) | LC | 87-99 | N | 17 | *CS* |
| *Potamogeton perfoliatus* (perfoliate pondweed) | LC | 87-99 | N | 8 | PS |
| *Potamogeton pusillus* (lesser pondweed) | LC | 87-99 | N | 13 | *CS* |
| *Potamogeton trichoides* (hairlike pondweed) | LC | 87-99 | N | 6 | PS |
| *Potentilla argentea* (hoary cinquefoil) | NT | 87-99 | N | 1 | PS |
| *Potentilla erecta subsp. strictissima* (tormentil) | LC | 87-99 | N | 7 | *CS* |
| *Potentilla tabernaemontani* (spring cinquefoil) | NS/LC | 87-99 | N | 3 | PS |
| *Prunus padus* (bird cherry) | LC | 87-99 | N | 26 | *CS* |
| ***Pseudorchis albida*** **(small white orchid)** | **VU*** | 87-99 | N | 1 | PS |
| *Puccinellia distans* (reflexed saltmarsh-grass) | LC | 87-99 | N | 12 | *CS* |
| *Puccinellia fasciculata* (Borrer's saltmarsh-grass) | NS/VU | Pre-70 | N | 2 | PS |
| *Puccinellia rupestris* (stiff saltmarsh-grass) | LC | 87-99 | N | 6 | PS |

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|---|---|---|---|---|---|
| *Pulicaria vulgaris* (small fleabane) | NR/CR*S8 | Pre-70 | N | 1 | PS |
| *Pyrola minor* (common winter green) | LC | 87-99 | N | 4 | PS |
| *Pyrola rotundifolia subsp. maritima* | NS/LC | 87-99 | N | 8 | *CS* |
| *Pyrus cordata* (Plymouth pear) | NR/VU*S8 | Pre-70 | N | 1 | PS |
| *Radiola linoides* (allseed) | NT | 87-99 | N | 1 | PS |
| ***Ranunculus arvensis* (corn buttercup)** | **CR*** | 87-99 | A | 1 | PS |
| *Ranunculus auricomus* (goldilocks buttercup) | LC | 87-99 | N | 20 | *CS* |
| *Ranunculus baudotii* (brackish water crowfoot) | LC | 87-99 | N | 13 | PS |
| *Ranunculus circinatus* (fan leaved water crowfoot) | LC | 87-99 | N | 6 | PS |
| *Ranunculus fluitans* (river water crowfoot) | LC | 87-99 | N | 8 | PS |
| *Ranunculus lingua* (greater spearwort) | LC | 87-99 | N | 6 | PS |
| *Ranunculus parviflorus* (small-flowered buttercup) | LC | 87-99 | N | 10 | PS |
| *Ranunculus penicillatus subsp.pseudofl.* | LC | 87-99 | N | 8 | PS |
| *Ranunculus sardous* (hairy buttercup) | LC | 87-99 | N | 14 | *CS* |
| *Ranunculus trichophyllos* (thread-leaved water-crowfoot) | LC | 87-99 | N | 16 | *CS* |
| ***Ranunculus tripartitus* (three-lobed water-crowfoot)** | **NS/EN*** | 87-99 | N | 2 | PS |
| *Reseda lutea* (wild mignonette) | LC | 87-99 | N | 34 | *CS* |
| *Rhamnus catharticus* (buckthorn) | LC | 87-99 | N | 19 | *CS* |
| *Rhinanthus minor subsp. stenophyllus* (yellow rattle) | DD | 87-99 | N | 7 | PS |
| *Rhynchospora alba* (white beak-sedge) | LC | 87-99 | N | 12 | PS |
| *Rhynchospora fusca* (brown beak-sedge) | NS/LC | Pre-70 | N | 1 | PS |
| *Rorippa amphibia* (great yellow-cress) | LC | 87-99 | N | 6 | PS |
| *Rorippa amphibia x R. sylvestris* | - | 87-99 | N | 1 | PS |
| *Rorippa islandica* (Northern yellow-cress) | NS/LC | 87-99 | N | 13 | PS |
| *Rorippa microphylla* (narrow-fruited watercress) | LC | 87-99 | N | 14 | *CS* |
| *Rorippa microphylla x R. nasturtium-aq.* | - | 87-99 | N | 18 | *CS* |
| *Rosa arvensis x R. canina* | - | 87-99 | N | 5 | PS |
| *Rosa caesia subsp. caesia* (hairy dog-rose) | LC | 70-86 | N | 2 | PS |
| *Rosa caesia subsp. glauca* (glaucous dog-rose) | - | 87-99 | N | 14 | *CS* |
| Ros*a caesia x R. canina* (*R. x dumalis*) | - | 87-99 | N | 21 | *CS* |
| *Rosa canina x R. obtusifolia* | - | 87-99 | N | 3 | PS |
| *Rosa canina x R. rubiginosa* | - | 87-99 | N | 1 | PS |
| *Rosa canina x R. sherardii* | - | 87-99 | N | 5 | PS |
| *Rosa canina x R. stylosa* | - | 87-99 | N | 11 | *CS* |
| *Rosa canina x R. tomentosa* | - | 87-99 | N | 4 | PS |
| *Rosa micrantha* (small-flowered sweet-briar) | LC | 87-99 | N | 11 | PS |
| *Rosa mollis* (soft downy-rose) | LC | 87-99 | N | 7 | PS |
| *Rosa obtusifolia* (round-leaved dog-rose) | LC | 87-99 | N | 1 | PS |
| *Rumex palustris* (marsh dock) | LC | 87-99 | N | 3 | PS |
| *Rosa pimpinellifolia* (burnet rose) | LC | 87-99 | N | 19 | *CS* |
| *Rosa pimpinellifolia x R. sherardii* | - | 87-99 | N | 1 | PS |
| *Rosa rubiginosa* (sweet briar) | LC | 87-99 | N | 7 | PS |
| *Rubus saxatilis* (stone bramble) | LC | 87-99 | N | 8 | PS |
| *Rosa stylosa* (short-styled field-rose) | LC | 87-99 | N | 17 | *CS* |
| *Rosa tomentosa (*harsh downy rose) | LC | 87-99 | N | 12 | PS |
| *Rubia peregrina* (madder) | LC | 87-99 | N | 23 | *CS* |
| *Rumex hydralopathum* (water dock) | LC | 87-99 | N | 29 | *CS* |
| *Rumex pulcher* (fiddle dock) | LC | 87-99 | N | 3 | PS |
| ***Rumex rupestris* (shore dock)** | **NS/EN*S8** | 87-99 | N | 1 | PS |
| *Ruppia cirrhosa* (spiral tasselweed) | NS/NT | Pre-70 | N | 1 | PS |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Ruppia maritima* (beaked tasselweed) | LC | 87-99 | N | 4 | PS |
| *Ruscus aculeatus* (butcher's-broom) | LC | 87-99 | N | 2 | PS |
| *Sagina maritim*a (sea pearlwort) | LC | 87-99 | N | 13 | *CS* |
| *Sagina nodosa* (knotted pearlwort) | LC | 87-99 | N | 21 | *CS* |
| *Sagina subulata* (heath pearlwort) | LC | 87-99 | N | 5 | PS |
| *Sagittaria sagittifolia* (arrowhead) | LC | 87-99 | N | 5 | PS |
| *Salicornia dolichostachya* (long-spiked glasswort) | LC | 87-99 | N | 10 | *CS* |
| *Salicornia europaea* (common glasswort) | LC | 87-99 | N | 7 | PS |
| *Salicornia fragilis* (yellow glasswort) | NS/LC | 87-99 | N | 5 | PS |
| *Salicornia nitens* (shiny glasswort) | DD | Pre-70 | N | 1 | PS |
| *Salicornia obscura* (glaucous glasswort) | NR/DD | 87-99 | N | 1 | PS |
| *Salicornia pusilla* (one-flowered glasswort) | NS/LC | 87-99 | N | 8 | PS |
| *Salicornia ramosissima* (purple glasswort) | LC | 87-99 | N | 13 | *CS* |
| *Salix aurita x S. repens* | - | 87-99 | N | 1 | PS |
| *Salix cinerea subsp.cinerea* (grey willow) | LC | 87-99 | N | 3 | PS |
| *Salix cinerea x S.purpurea x S.viminalis* | - | 87-99 | N | 1 | PS |
| *Salix herbacea* (dwarf willow) | LC | 70-86 | N | 3 | PS |
| *Salix pentandra* (bay willow) | LC | 87-99 | N | 3 | PS |
| *Salix purpurea* (purple willow) | LC | 87-99 | N | 16 | *CS* |
| *Salix purpurea x S. viminalis* | - | 87-99 | N | 1 | PS |
| *Salix trandra* (almond willow) | LC | 87-99 | N | 17 | *CS* |
| ***Salsola kali subsp. kali* (prickle saltwort)** | **VU*** | 87-99 | N | 12 | PS |
| *Salvia pratensis* (meadow clary) | NS/NT;S8 | 87-99 | N | 1 | PS |
| *Salvia verbenaca* (wild clary) | LC | 87-99 | N | 8 | *CS* |
| *Sambucus ebulus* (dwarf elder) | LC | 87-99 | A | 24 | *CS* |
| *Samolus valerandi* (brookweed) | LC | 87-99 | N | 24 | *CS* |
| *Saxifraga granulata* (meadow saxifrage) | LC | 87-99 | N | 22 | *CS* |
| *Saxifraga hypnoides* (mossy saxifrage) | VU | 87-99 | N | 11 | PS |
| *Saxifraga oppositifolia (*purple saxifrage) | LC | 70-86 | N | 1 | PS |
| *Scabiosa columbaria* (small scabious) | LC | 87-99 | N | 14 | *CS* |
| ***Scandix pecten-veneris* (shepherd's-needle)** | **CR*** | 87-99 | A | 1 | PS |
| *Schoenoplectus lacustris* (common club-rush) | LC | 87-99 | N | 11 | *CS* |
| *Schoenoplectus tabernaemontani* (grey club-rush) | LC | 87-99 | N | 17 | *CS* |
| *Schoenus nigricans* (black bog rush) | LC | 87-99 | N | 3 | PS |
| *Scilla autumnalis* (Autumn squill) | NS/LC | Pre-70 | N | 1 | PS |
| *Scilla verna (*Spring squill*)* | LC | 87-99 | N | 10 | *CS* |
| *Scirpoides holoschoenus* (round-headed club-rush)**Ψ** | NR/EN | 87-99 | A | 5 | PS |
| *Scirpus sylvaticus* (wood club-rush) | LC | 87-99 | N | 25 | *CS* |
| ***Scleranthus annuus* (annual knawel)** | **EN*** | 87-99 | N | 5 | PS |
| *Scorzonera humilis* (viper's-grass) | NR/VU;S8 | 87-99 | N | 2 | PS |
| *Scrophularia umbrosa* (green figwort) | LC | Pre-70 | N | 1 | PS |
| *Sedum forsterianum* (rock stonecrop) | NS/LC | 87-99 | N | 5 | PS |
| *Sedum roseum* (roseroot) | LC | 87-99 | N | 3 | PS |
| *Selaginella selaginoides* (lesser club-moss) | -/LC | 87-99 | N | 1 | PS |
| *Senecio aquaticus x S. jacobaea* | - | 87-99 | N | 4 | *CS* |
| *Seriphidium maritimum* (sea wormwood) | LC | 87-99 | N | 15 | *CS* |
| *Sibthorpia europea* (Cornish moneywort) | NS/LC | 87-99 | N | 13 | PS |
| *Silaum silaus* (pepper-saxifrage) | LC | 87-99 | N | 21 | *CS* |
| *Silene conica* (sand catchfly) | NS/VU | 87-99 | N | 2 | PS |
| ***Silene gallica* (small-flowered catchfly)** | **NS/EN*** | 87-99 | A | 5 | PS |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Silene noctiflora* (night-flowering catchfly) | VU | 87-99 | A | 1 | PS |
| *Silene nutans (*Nottingham catchfly) | NS/NT | 87-99 | N | 1 | PS |
| *Silene uniflora* (sea campion) | LC | 87-99 | N | 20 | *CS* |
| *Sison amomum* (stone parsley) | LC | 87-99 | N | 19 | *CS* |
| *Sium latifolium* (greater water-parsnip) | NS/EN | Pre-70 | N | 1 | PS |
| *Sorbus anglica* (a whitebeam) | NR/NT | 87-99 | N | 4 | PS |
| *Sorbus domestica* (true service tree) | NR/CR | 87-99 | N | 2 | PS |
| ***Sorbus eminens* (a whitebeam)** | **NR/EN*** | 87-99 | N | 2 | PS |
| ***Sorbus leptophylla* (a whitebeam)** | **NR/EN*** | 87-99 | N | 2 | PS |
| ***Sorbus leyana* (a whitebeam)** | **NR/CR*** | 87-99 | N | 2 | PS |
| ***Sorbus minima* (a whitebeam)** | **NR/VU*** | 87-99 | N | 1 | PS |
| *Sorbus porrigentiformis* (green-leaved whitebeam) | NS/LC | 87-99 | N | 14 | PS |
| *Sorbus rupicola* (rock whitebeam) | NS/LC | 87-99 | N | 5 | PS |
| *Sorbus torminalis* (wild service) | LC | 87-99 | N | 22 | *CS* |
| *Sparganium angustifolium* (floating bur-reed) | LC | 87-99 | N | 4 | PS |
| *Sparganium emersum* (unbranched bur-reed) | LC | 87-99 | N | 29 | *CS* |
| *Sparganium natans* (least bur-reed) | LC | 87-99 | N | 1 | PS |
| *Spartina alterniflora x S. maritima* | - | 87-99 | N | 1 | PS |
| *Spergularia marina* (lesser sea-spurrey) | LC | 87-99 | N | 19 | *CS* |
| *Spergularia media* (greater sea-spurrey) | LC | 87-99 | N | 22 | *CS* |
| *Spergularia rupicola* (rock sea-spurrey) | LC | 87-99 | N | 9 | PS |
| *Spiranthes spiralis* (autumn lady's-tresses) | NT | 87-99 | N | 17 | PS |
| *Spirodela polyrhiza* (greater duckweed) | LC | 87-99 | N | 16 | *CS* |
| *Stellaria nemorum* (incl. ssp nemorum) (wood-stitchwort) | LC | 87-99 | N | 7 | PS |
| *Stellaria pallida* (lesser chickweed) | LC | 87-99 | N | 11 | PS |
| ***Stellaria palustris* (marshy stichwort)** | **VU*** | Pre-70 | N | 1 | PS |
| *Stachys palustris x S. sylvatica* | - | 87-99 | N | 16 | *CS* |
| *Subularia aquatica* (awlwort) | LC | Pre-70 | N | 1 | PS |
| *Thalictrum flavum* (meadow rue) | LC | 87-99 | N | 8 | PS |
| *Thalictrum minus* (lesser meadow-rue) | LC | 87-99 | N | 11 | PS |
| *Thelypteris palustris* (marsh fern) | NS/LC | 87-99 | N | 3 | PS |
| *Thymus pulegioides* (large thyme) | LC | 87-99 | N | 8 | PS |
| *Tilia platyphyllos* (large-leaved lime) | NS/LC | 87-99 | N | 7 | PS |
| *Torilis nodosa* (knotted hedge-parlsey) | LC | 87-99 | N | 14 | *CS* |
| *Trichomanes speciosum* (gametophyte) (Killarney fern) | NR/LC | 87-99 | N | 9 | PS |
| *Trichomanes speciosum* (sporophyte) | NR/LC | 87-99 | N | 1 | PS |
| *Trifolium fragiferum* (strawberry clover) | LC | 87-99 | N | 20 | *CS* |
| *Trifolium glomeratum* (clustered clover) | NS/LC | Pre-70 | N | 2 | PS |
| *Trifolium ornithopodioides* (bird's-foot clover) | LC | 87-99 | N | 10 | PS |
| *Trifolium scabrum* (rough clover) | LC | 87-99 | N | 24 | *CS* |
| *Trifolium squamosum* (sea clover) | NS/LC | 87-99 | N | 8 | PS |
| *Trifolium striatum* (knotted clover) | LC | 87-99 | N | 25 | *CS* |
| *Trifolium subterraneum* (subterraneum clover) | LC | 87-99 | N | 6 | PS |
| ***Trollius europaeus* (globe-flower)** | **LC*** | 87-99 | N | 12 | PS |
| *Typha angustifolia* (lesser bulrush) | LC | 87-99 | N | 8 | PS |
| *Typha angustifolia x T. latifolia* | - | 87-99 | N | 1 | PS |
| *Ulex europaeus x U. gallii* | - | 87-99 | N | 1 | *CS* |
| *Ulmus minor* (small-leaved elm) | LC | 87-99 | N | 19 | *CS* |
| *Ulmus plotii* (plot's elm) | - | Pre-70 | N | 1 | PS |
| *Urtica urens* (small nettle) | LC | 87-99 | A | 26 | *CS* |

| **Scarce and Rare Vascular Plants recorded in Carmarthenshire, Glamorgan and Monmouthshire** | GB/IUCN RDB Status[2]; **S42*;** S8 | **Date range[3]** | **N**ative/ **A**lien **Status[3]** | **No of Hectads[3] in C,G,&M** | **Selection Priority** |
|---|---|---|---|---|---|
| *Utricularia australis* (bladderwort) | LC | 87-99 | N | 6 | PS |
| *Utricularia minor* (lesser bladderwort) | LC | 87-99 | N | 7 | PS |
| *Utricularia vulgaris sens. str*. (greater bladderwort) | LC | 87-99 | N | 1 | PS |
| *Vaccinium oxycoccus* (cranberry) | LC | 87-99 | N | 28 | *CS* |
| *Vaccinium vitis-idaea* (cowberry) | LC | 87-99 | N | 9 | PS |
| *Valarienella carinata* (keel-fruited corn-salad) | LC | 87-99 | A | 24 | *CS* |
| *Valerianella dentata* (narrow-fruited corn-salad) | EN | 87-99 | A | 2 | PS |
| ***Valerianella rimosa* (broad-fruited cornsalad)** | **NS/EN*** | Pre-70 | A | 2 | PS |
| *Verbascum lychnitis* (white mullein) | NS/LC | 87-99 | A | 3 | PS |
| *Verbascum nigrum* (black mullein) | LC | 87-99 | N | 4 | PS |
| *Verbascum virgatum* (twiggy mullein) | LC | 87-99 | A | 12 | PS |
| *Veronica agrestis* (green field-speedwell) | LC | 87-99 | A | 50 | *CS* |
| *Veronica anagallis-aquatica* (blue water-speedwell) | LC | 87-99 | N | 16 | *CS* |
| *Veronica catenata* (pink water speedwell) | LC | 87-99 | N | 22 | *CS* |
| *Veronica polita* (grey field-speedwell) | - | 87-99 | A | 45 | *CS* |
| *Veronica spicata* (spiked speedwell) | LC | 87-99 | N | 2 | PS |
| *Viburnum lantana* (wayfaring tree) | LC | 87-99 | N | 24 | *CS* |
| *Vicia lathyroides* (spring vetch) | LC | 87-99 | N | 8 | PS |
| ***Vicia orobus* (wood bitter-vetch)** | **NS/NT*** | 87-99 | N | 20 | PS |
| *Vicia sylvatica* (wood vetch) | LC | 87-99 | N | 9 | PS |
| *Viola canina* (heath dog-violet) | NT | 87-99 | N | 15 | PS |
| *Viola hirta* (hairy dog-violet) | LC | 87-99 | N | 24 | *CS* |
| ***Viola lactea* (pale dog-violet)** | **NS/VU*** | 87-99 | N | 6 | PS |
| *Viola lutea* (mountain pansy) | LC | 87-99 | N | 10 | PS |
| *Viola palustris subsp. juressi* (marsh violet) | LC | 87-99 | N | 10 | *CS* |
| *Viola tricolor* (wild pansy) | NT | 87-99 | N | 27 | PS |
| *Viola tricolor subsp. curtisii* (wild pansy) | LC | 87-99 | N | 10 | *CS* |
| *Viscum album* (mistletoe) | LC | 87-99 | N | 27 | *CS* |
| *Vulpia ciliata* (bearded fescue) | LC | 87-99 | N | 1 | PS |
| *Vulpia fasciculata* (dune fescue) | NS/LC | 87-99 | N | 14 | *CS* |
| *Wolffia arhiza* (rootless duckweed) | NR/VU | 87-99 | N | 1 | PS |
| *Zannichellia palustris* (horned pondweed) | LC | 87-99 | N | 21 | *CS* |
| *Zostera angustifolia* (narrow-leaved eelgrass) | - | 87-99 | N | 1 | PS |
| *Zostera marina* (eelgrass) | NT | 87-99 | N | 2 | PS |
| *Zostera noltii* (dwarf eelgrass) | NS/VU | 87-99 | N | 1 | PS |

**Highlighted *** = S42 list vascular plant species

**Ψ** = S42 waiting list, due to questionable Native/Alien status.

## S7) LICHENS

Over 1,160 species of lichens have been recorded from Wales (Woods & Orange 1999), some 75% of the entire British lichen flora and no less than 8% of the entire world lichen flora. Many of these species are known in only very small quantity or from a very few sites. Over 150 species are considered to be threatened and 20 may be extinct, having not been seen since at least 1950.

Further useful information is available in Common Standards Monitoring Guidance for Bryophytes and Lichens Version July 2005 available at http://www.jncc.gov.uk/pdf/CSM_bryosLichens.pdf , other resources can in found on the British Lichen Bryological Society website http://www.thebls.org.uk/index.html and Gilbert, O. (2000) provides an excellent introduction to lichens.

The following categories should be considered for selection:

- Any site supporting a species which is listed in the Red Data Book for Lichens (Church et al, 1996) or the Section 42 List with the specific requirement for site and/or habitat action (WAG 2008).

- Any site supporting a species recorded from 10 or fewer 10km grid squares in Wales (where the distribution is well known), using the CCW Lichens of Conservation Concern database, see Table 13.

- Any site supporting a species recorded from 3 or fewer sites within a Watsonian Vice County (where the distribution is well known).

- Any site supporting a significant population of a Local Priority Species listed in the Local Biodiversity Action Plan.

**Table 13 A Draft List of scarce and rare Lichens recorded in Wales (**after Wales Assembly Government (2008); National Biodiversity Network Gateway/ CCW Lichens of Conservation Concern - Site Data, Wales[3]**)**

| **A draft list of scarce and rare Lichens recorded in Wales + Wales only lichen species or lichen communities** | **GB/IUCN RDB Status/ S42*** | **W&CA** | **Date Range** | **No of hectads in Wales** |
|---|---|---|---|---|
| ***Anaptychia ciliaris subsp. ciliaris*** | **NR/VU*** | - | 1950-2008 | 4 |
| ***Arthonia atlantica*** | **NR/EN*** | - | 1950-2008 | ? |
| ***Arthothelium dictyosporum*** | **NR/NT*** | - | 1950-2008 | ? |
| ***Bacidia circumspecta*** | **NS/VU*** | - | 1950-2008 | 5 |
| ***Bacidia incompta*** | **NS/VU*** | - | 1950-2008 | 13 |
| *Biatoridium delitescens* | NR/VU | - | 1950-2008 | 1 |
| ***Biatoridium monasteriense*** | **NR/EN*** | - | 1950-2008 | 1 |
| ***Blarneya hibernica*** | **NR/NT*** | - | 1950-2008 | 1 |
| ***Bryoria smithii*** | **NR/CR*** | - | 1950-2008 | 2 |
| ***Buellia hyperbolica*** | **NR/VU*** | - | 1950-2008 | ? |
| ***Calicium adspersum*** | **NR/CR*** | - | 1950-2008 | 1 |
| ***Caloplaca atroflava*** | **NR/CR*** | - | 1950-2008 | 2 |
| ***Caloplaca flavorubescens*** | **NS/EN*** | - | 1950-2008 | 3 |
| ***Caloplaca herbidella*** | **NR/VU*** | - | 1950-2008 | 6 |
| ***Caloplaca lucifuga*** | **NR/VU*** | - | 1950-2008 | 5 |
| ***Caloplaca luteoalba* (Orange-fruited Elm Lichen)** | **NS/VU*** | Sch. 8 | 1950-2008 | 6 |
| *Catapyrenium psoromoides* (tree psoromoides) | NR/CR | Sch. 8 | Pre-1982 | 1 |
| ***Chaenotheca phaeocephala*** | **NR/CR*** | - | 1950-2008 | 1 |

| **A draft list of scarce and rare Lichens recorded in Wales**<br>**+ Wales only lichen species or lichen communities** | **GB/IUCN RDB Status/ S42*** | **W&CA** | **Date Range** | **No of hectads in Wales** |
|---|---|---|---|---|
| *Cladonia fragilissima* | LC | - | 1950-2008 | 5 |
| *Cladonia mediterranea* (Reindeer lichen) | NR/CR | - | 1950-2008 | 1 |
| ***Cladonia peziziformis*** | **NR/CR*** | - | 1950-2008 | 2 |
| *Cladonia stygia* | NR/DD | - | 1950-2008 | 1 |
| *Cladonia uncialis subsp. uncialis* | NR/VU | - | 1950-2008 | 7 |
| ***Collema dichotomum* (River-jelly Lichen)** | **NS/VU*** | Sch. 8 | 1950-2008 | 9 |
| ***Collema fasciculare*** | **NS/NT*** | - | 1950-2008 | ? |
| ***Collema fragile* SGC** | **NS/VU*** | - | 1950-2008 | 3 |
| ***Collema fragrans*** | **NS/EN*** | - | 1950-2008 | 7 |
| *Collema parvum* | NR/VU | - | 1950-2008 | 1 |
| *Degelia ligulata* | NR/VU | - | 1950-2008 | 1 |
| *Dictyonema interruptum* | NR/DD | - | 1950-2008 | 2 |
| ***Endocarpon adscendens*** | **NR/EN*** | - | 1950-2008 | 4 |
| *Endocarpon pusillum* | NR/EN | - | 1950-2008 | 1 |
| ***Fulgensia fulgens*** | **NR/EN*** | - | 1950-2008 | 1 |
| ***Fuscopannaria sampaiana*** | **NS/NT*** | - | 1950-2008 | 2 |
| ***Gomphillus calycioides*** | **NS/NT*** | - | 1950-2008 | ? |
| ***Graphina pauciloculata*** | **NR/VU*** | - | 1950-2008 | 1 |
| **+ *Gyalecta flotowii*** | **NS/NT*** | - | 1950-2008 | 3 |
| *Gyalideopsis scotica* | NS/NT | - | 1950-2008 | 1 |
| ***Heterodermia leucomela* (Ciliate Strap-lichen)** | **NR/EN*** | Sch. 8 | 1950-2008 | 3 |
| *Hypotrachyna taylorensis* | LC | - | 1950-2008 | 5 |
| ***Lecania chlorotiza*** | **NS/NT*** | - | 1950-2008 | ? |
| ***Lecanographa amylacea*** | **NS/VU*** | - | 1950-2008 | 3 |
| ***Lecanora achariana*** | **NR/CR*** | Sch. 8 | 1950-2008 | 1 |
| ***Lecanora quercicola*** | **NS/NT*** | - | 1950-2008 | 1 |
| *Lecanora strobilina* | NR/VU | - | 1950-2008 | 2 |
| ***Lecanora sublivescens*** | **NS/NT*** | - | 1950-2008 | 2 |
| *Leptogium burgessii* | LC | - | 1950-2008 | 1 |
| ***Leptogium brebissonii*** | **NS/NT*** | - | 1950-2008 | ? |
| ***Leptogium cochleatum*** | **NS/VU*** | - | 1950-2008 | 1 |
| **+ *Lobarion* Lichen Community** | **-*** | - | 1950-2008 | 3 |
| + *Lobaria amplissima* (part of Lobarion lichen community) | LC* | - | 1950-2008 | 4 |
| + *Lobaria virens* (part of Lobarion lichen community) | LC* | - | 1950-2008 | 3 |
| ***Megalospora tuberculosa*** | **NS/NT*** | - | 1950-2008 | ? |
| ***Melaspilea lentiginosa* (a lichenicolous fungus)** | **NS/NT*** | - | 1950-2008 | ? |
| *Melaspilea interjecta* | NR/DD | - | 1950-2008 | 3 |
| **+ Mine Site Lichen Community** | **-*** | - | - | - |
| ***Opegrapha paraxanthoides*** | **NR/NT*** | - | 1950-2008 | 1 |
| *Parmelia quercina* | NS/VU | - | 1950-2008 | 3 |
| + *Parmelinopsis horrescens* | ? | - | 1950-2008 | ? |
| *Parmotrema robustum* | NR/CR | - | 1950-2008 | 2 |
| ***Peltigera venosa*** | **NS/VU*** | - | 1950-2008 | 1 |
| *Pertusiaria pustulata* | NR/VU | - | Pre-1870 | EX? |
| *Pertusaria melanochlora* | NR/EN | - | Pre-1980s | EX? |
| ***Pertusaria velata*** | **NS/VU*** | - | 1950-2008 | 3 |
| *Physcia clementei* | NS/NT | - | 1950-2008 | 1 |
| ***Physcia tribacioides* (Southern Grey Physcia)** | **NS/VU*** | Sch. 8 | 1950-2008 | 1 |
| *Poeltinula cerebrina* | NR/VU | - | Pre-1910 | EX? |
| *Porinia atlantica* | NR/CR | - | 1950-2008 | 1 |
| ***Porina effilata*** | **?*** | - | 1950-2008 | ? |
| ***Porina hibernica*** | **NR/NT*** | - | 1950-2008 | 1 |
| *Porinia rosei* | NS/NT | - | 1960-2008 | 7 |
| *Protoparmelia atriseda* | NR/VU | - | 1950-2008 | 2 |

| **A draft list of scarce and rare Lichens recorded in Wales**<br>**+ Wales only lichen species or lichen communities** | **GB/IUCN RDB Status/ S42*** | **W&CA** | **Date Range** | **No of hectads in Wales** |
|---|---|---|---|---|
| ***Pseudocyphellaria intricata*** | **NS/NT*** | - | 1950-2008 | 1 |
| ***Pseudocyphellaria lacerata* (Ragged Pseudocyphellaria)** | **NR/VU*** | Sch. 8 | 1950-2008 | 1 |
| ***Pseudocyphellaria norvegica*** | **NS/LC*** | - | 1950-2008 | 1 |
| *Pyrenula coryli* | NR/VU | - | 1950-2008 | 1 |
| ***Pyrenula hibernica*** | **NR/VU*** | - | 1950-2008 | ? |
| ***Pyrenula nitida*** | **NR/VU*** | - | 1950-2008 | ? |
| *Ramalina potuensis* | NS/LC | - | 1950-2008 | 2 |
| ***Ramonia chrysophaea*** | **NS/NT*** | - | 1950-2008 | ? |
| ***Ramonia dictyospora*** | **NR/NT*** | - | 1950-2008 | ? |
| ***Rinodina isidioides*** | **NS/NT*** | - | 1950-2008 | 1 |
| ***Schismatomma graphidioides*** | **NR/VU*** | - | 1950-2008 | 1 |
| *Staurothele rufa* | NR/EN | - | 1950-2008 | 1 |
| ***Stereocaulon delisei*** | **NS/NT*** | - | 1950-2008 | ? |
| ***Stereocaulon symphycheilum*** | **NR/EN*** | - | 1950-2008 | 1 |
| ***Sticta canariensis*** | **?/LC*** | - | 1950-2008 | ? |
| **+ *Strangospora microhaema*** | **NR/NT*** | - | 1950-2008 | 1 |
| ***Strigula stigmatella var. stigmatella*** | **NR/EN*** | - | 1950-2008 | ? |
| ***Synalissa symphorea*** | **NR/VU*** | - | 1950-2008 | 1 |
| ***Teloschistes flavicans* (Golden Hair-lichen)** | **NS/VU*** | Sch. 8 | 1950-2008 | 17 |
| ***Toninia sedifolia*** | **?/LC*** | - | 1950-2008 | 1 |
| *Thelenella larbalestieri* | NR/VU | - | 1950-2008 | 1 |
| ***Usnea articulata*** | **?/NT*** | - | 1950-2008 | ? |
| ***Usnea florida*** | **?/LC*** | - | 1950-2008 | 5 |
| *Vestergrenopsis elaeina* | NR/VU | - | 1950-2008 | 1 |
| ***Wadeana dendrographa*** | **NS/NT*** | - | 1950-2008 | ? |
| *Xanthoparmelia tinctina* | NR/VU | - | 1950-2008 | 1 |

## S8) BRYOPHYTES [MOSSES, LIVERWORTS & HORNWORTS]

DA Ratcliffe said of Britain and Ireland that 'in its Atlantic bryophyte element, it is not only the richest part of the whole continent, but it is also one of the richest areas of the world' (Ratcliffe 1968). Just over 1000 occur in Britain, (289 species of liverwort, and 745 species, sub-species and varieties of moss). A large proportion of the British species occur in Wales, 76% occur in North Wales alone, Hale A. http://home.clara.net/adhale/bryos/index.htm .

Further useful information is available in Common Standards Monitoring Guidance for Bryophytes and Lichens Version July 2005 available at http://www.jncc.gov.uk/pdf/CSM_bryosLichens.pdf , other resources can in found on the British Bryological Society website http://rbg-web2.rbge.org.uk/bbs/bbs.htm , and Porley, R. and Hodgetts, N. (2005) provides an excellent introduction to bryophytes.

The following categories should be considered for selection:

- Any site which supports a species which is listed in the Red Data Book for Mosses and Liverworts (Church et al, 2001), or the Section 42 List with the specific requirement for site and/or habitat action (WAG, 2008).

- Any site, which supports a species, which is recorded from 5 or fewer hectads or sites within a Watsonian Vice County (where the distribution is well known), see Table 14 (a).

- Any site that supports a significant population of a Local Priority Species listed in the Local Biodiversity Action Plan.

Some areas within Wales have been better recorded for bryophytes than others, and where queries occur the appropriate county recorder/specialist should be contacted.

**Table 14(a) A Draft List of Scarce and Rare Bryophytes recorded in Wales (**after Common Standards Monitoring for Bryophytes and Lichens (July 2005); Wales Assembly Government (2008)*; JNCC (20071217)[2]; All Wales Biodiversity Species Audit (2003)[1]; and National Biodiversity Network Gateway/ Bryophyte data for Great Britain from the British Bryological Society [3]**)**

| A Draft List of Scarce and Rare Bryophytes recorded in Wales | GB/IUCN RDB[2] Status | S.42* list; W&CA Sch. 8 | Date range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| *Aloina ambigua* (tall aloe-moss) | NS | - | 1950-2008 | 8 |
| *Aloina rigida* (rigid aloe-moss) | NS | - | 1950-2008 | 1 |
| *Amblyodon dealbatus* (short-tooth hump-moss) | NS | - | 1950-2008 | 6 |
| *Amblystegium confervoides* (tiny feather-moss) | NS | - | 1950-2008 | 9 |
| *Amblystegium humile* (constricted feather-moss) | NS | - | 1950-2008 | 2 |
| *Amblystegium radicale* (swamp feather-moss) | NR | - | 1950-2008 | 6 |
| *Amphidium lapponicum* (Lapland yoke-moss) | NS | - | 1950-2008 | 9 |
| *Anastrophyllum hellerianum* (Heller's notchwort) | NS | - | 1950-2008 | 6 |
| *Andreaea megistospora* (big-spored rock-moss) | NS | - | 1950-2008 | 2 |
| *Andreaea mutabilis* (changeable rock-moss) | NS | - | 1950-2008 | 4 |
| *Andreaea rothii rothii* (dusky rock moss) | NS | - | 1950-2008 | 6 |
| ***Anomodon longifolius* (long-leaved tail-moss)** | **NR/EN** | **42*; S.8** | 1950-2008 | 2 |
| *Anthelia juratzkana* (scarce silverwort) | NS | - | 1950-2008 | 5 |
| *Anthoceros agrestis* (field hornwort) | NS | - | 1950-2008 | 9 |
| *Anthoceros punctatus* (dotted hornwort) | - | - | 1950-2008 | 32 |
| *Arctoa fulvella* (arctic fork-moss) | NS | - | 1950-2008 | 5 |
| ***Atrichum angustatum* (lesser smoothcap)** | **NR/CR** | **42*** | 1950-2008 | 1 |

| A Draft List of Scarce and Rare Bryophytes recorded in Wales | GB/IUCN RDB[2] Status | S.42* list; W&CA Sch. 8 | Date range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| *Atrichum tenellum* (slender smoothcap) | NS | - | 1950-2008 | 2 |
| *Barbilophozia atlantica* (Atlantic paw-wort) | NS | - | 1950-2008 | 13 |
| ***Barbilophozia kunzeana* (bog paw-wort)** | **NR/VU** | **42*** | 1990-2008 | 3 |
| *Bartramia halleriana* (Haller's apple-moss) | NS | - | 1950-2008 | 21 |
| ***Bartramia stricta* (upright apple-moss)** | **NR/CR** | **42*; S.8** | 1950-2008 | 2 |
| *Brachydontium trichodes* (bristle-leaf) | NS | - | 1950-2008 | 15 |
| *Brachythecium salebrosum* (smooth-stalk feather-moss) | NS | - | 1950-2008 | 2 |
| ***Bryum calophyllum* (matted bryum)** | **NR/EN** | **42*** | 1950-2008 | 3 |
| *Bryum canariense* (canary thread-moss) | NS | - | 1950-2008 | 13 |
| *Bryum elegans* (blushing bryum) | NS | - | 1950-2008 | 2 |
| *Bryum gemmilucens* (yellow-bud bryum) | NR/NT | - | 1950-2008 | ? |
| ***Bryum gemmiparum* (Welsh thread-moss)** | **NR/EN** | **42*** | 1950-2008 | 4 |
| ***Bryum knowltonii* (Knowlton`s thread-moss)** | **NR/VU** | **42*** | 1950-2008 | 4 |
| ***Bryum marratii* (Baltic bryum)** | **NR/EN** | **42*** | 1950-2008 | 2 |
| *Bryum mildeanum* (Milde's thread-moss) | NS | - | 1950-2008 | 4 |
| *Bryum muehlenbeckii* (Muehlenbeck's thread-moss) | NR/DD | - | 1950-2008 | 1 |
| *Bryum neodamense* (Long-leaved Thread-moss) | NR/DD | - | 1950-2008 | 1 |
| *Bryum pallescens* (tall-clustered thread-moss) | NS | - | 1950-2008 | >50 |
| *Bryum riparium* (river thread-moss) | NS | - | 1950-2008 | 11 |
| *Bryum tenuisetum* (yellow-tuber thread-moss) | NS | - | 1950-2008 | 16 |
| *Bryum torquescens* (twisting thread-moss) | NS | - | 1950-2008 | 7 |
| ***Bryum warneum* (sea bryum)** | **NS/VU** | **42** | 1950-2008 | 3 |
| *Bryum weigelii* (Duval's thread-moss) | NS | - | 1950-2008 | 2 |
| *Buxbaumia aphylla* (brown shield-moss) | NS | - | 1950-2008 | 2 |
| *Calypogeia integristipula* (Meylan's pouchwort) | NS | - | 1950-2008 | 2 |
| *Campylophyllum calcareum* (chalk feather-moss) | NS | - | 1950-2008 | 10 |
| *Campylopus gracilis* (Schwartz's swan-necked moss) | NS | - | 1950-2008 | 9 |
| *Campylopus pilifer* (stiff swan-neck moss) | NS | - | 1950-2008 | 9 |
| *Campylopus setifolius* (silky swan-neck moss) | NS | - | 1950-2008 | 13 |
| *Campylostelium saxicola* (bent-moss) | NS | - | 1950-2008 | 5 |
| *Catoscopium nigritum* (down-looking moss) | NS | - | 1950-2008 | 2 |
| *Cephalozia catenulata* (chain pincerwort) | NS | - | 1950-2008 | 13 |
| *Cephalozia loitlesbergeri* (scissors pincerwort) | NS | - | 1950-2008 | 2 |
| *Cephalozia macrostachya* (bog pincerwort) | NS | - | 1950-2008 | 6 |
| *Cephalozia pleniceps* (Blunt's pincerwort) | NS | - | 1950-2008 | 21 |
| ***Cephaloziella calyculata* (entire threadwort)** | **NR/VU** | **42*** | 1990-2008 | 3? |
| *Cephaloziella elachista* (spurred threadwort) | NR | - | 1950-2008 | 1 |
| *Cephaloziella massalongi* (lesser copperwort) | NR/NT | - | 1950-2008 | 3 |
| ***Cephaloziella nicholsonii* (greater copperwort)** | **NS/VU** | **42*** | 1950-2008 | 1 |
| *Cephaloziella spinigera* (spiny threadwort) | NS | - | 1950-2008 | 1 |
| *Cephaloziella stellulifera* (heath threadwort) | NS | - | 1950-2008 | 22 |
| *Cephaloziella turneri* (Turner's threadwort) | NS/NT | - | 1950-2008 | 5 |
| *Cladopodiella francisci* (Holt notchwort) | NS | - | 1950-2008 | 3 |
| *Cololejeunea rossettiana* (Rossetti's pouncewort) | NS | - | 1950-2008 | 9 |
| *Coscinodon cribrosus* (sieve-tooth moss) | NS | - | 1950-2008 | 21 |
| ***Cryphaea lamyana* (multi-fruited river moss)** | **NR/VU** | **42*** | 1950-2008 | 5 |
| *Cryptothallus mirabilis* (ghostwort) | NS | - | 1950-2008 | 10 |
| *Cynodontium jenneri* (Jenner's dog-tooth) | NS | - | 1950-2008 | 3 |
| *Cynodontium polycarpon* (many-fruited dog-tooth) | NR | - | 1950-2008 | 1 |
| *Dichodontium flavescens* (yellowish fork-moss) | NS | - | 1950-2008 | 9 |
| *Dicranodontium asperulum* (orange bow-moss) | NS | - | 1950-2008 | 1 |
| *Dicranoweisia crispula* (mountain pincushion) | NS | - | 1950-2008 | 2 |
| ***Dicranum bergeri* (waved fork-moss)** | **NS/VU** | **42*; S 8** | 1950-2008 | 4 |
| *Dicranum flagellare* (whip fork-moss) | NS | - | 1950-2008 | 3 |

| A Draft List of Scarce and Rare Bryophytes recorded in Wales | GB/IUCN RDB[2] Status | S.42* list; W&CA Sch. 8 | Date range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| *Dicranum leioneuron* (fuzzy fork-moss) | NR/DD | - | 1950-2008 | 6 |
| *Dicranum polysetum* (rugose fork-moss) | NS | - | 1950-2008 | 1 |
| *Didymodon acutus* (pointed beard-moss) | NS | - | 1950-2008 | 9 |
| ***Didymodon tomaculosus* (sausage beard-moss)** | **NS** | **42*** | 1950-2008 | 1 |
| *Didymodon umbrosus* (shady beard-moss) | NS | - | 1950-2008 | 3 |
| *Discelium nudum* (flag-moss) | NS | - | 1950-2008 | 9 |
| *Distichium inclinatum* (inclined distichium) | NS | - | 1950-2008 | 12 |
| *Ditrichum flexicaule* (bendy ditrichum) | NS | - | 1950-2008 | 18 |
| *Ditrichum lineare* (dark ditrichum) | NS | - | 1950-2008 | 13 |
| ***Ditrichum plumbicola* (lead–moss)** | **NR/NT** | **42*** | 1950-2008 | 8 |
| *Ditrichum pusillum* (brown ditrichum) | NS | - | 1950-2008 | 4 |
| ***Ditrichum subulatum* (awl-leaved ditrichum)** | **NR/VU** | **42*** | 1950-2008 | 3 |
| *Ditrichum zonatum* (alpine ditrichum) | NS | - | 1950-2008 | 14 |
| *Drepanocladus lycopodioides* (large hook-moss) | NS | - | 1950-2008 | 3 |
| *Drepanocladus sendtneri* (chalk hook-moss) | NS | - | 1950-2008 | 6 |
| *Encalypta ciliata* (fringed extinguisher-moss) | NS | - | 1950-2008 | 17 |
| *Ephemerum hibernicum* (an earth-moss) | ? | - | 1950-2008 | 2 |
| *Ephemerum recurvifolium* (strap-leaved earth-moss) | NS | - | 1950-2008 | 2 |
| *Ephemerum sessile* (sessile earth-moss) | NS | - | 1950-2008 | 10 |
| *Eremonotus myriocarpus* (clubwort) | NS | - | 1950-2008 | 8 |
| *Eurhynchium striatulum* (lesser striated feather-moss) | NS | - | 1950-2008 | 16 |
| *Fissiden celticus* (Welsh pocket moss)[1] | - | - | 1950-2008 | >50 |
| ***Fissidens curvatus* (Portuguese Pocket- moss)** | **NR/EN** | **42*** | 1950-2008 | 7 |
| *Fissidens exiguus* (tiny pocket moss) | - | - | 1950-2008 | 3 |
| *Fissidens limbatus* (Herzog's pocket-moss) | NS | - | 1950-2008 | 11 |
| *Fissidens monguillonii* (Atlantic pocket-moss) | NR/NT | - | 1950-2008 | 7 |
| *Fissidens polyphyllus* (many-leaved pocket-moss) | NS | - | 1950-2008 | 5 |
| *Fissidens rivularis* (river pocket-moss) | NS | - | 1950-2008 | 21 |
| *Fissidens rufulus* (beck pocket-moss) | NS | - | 1950-2008 | 26 |
| ***Fissidens serrulatus* (Large Atlantic Pocket- moss)** | **NR/VU** | **42*** | 1950-2008 | 1 |
| *Fossombronia angulosa* (greater frillwort) | NS | - | 1950-2008 | 7 |
| *Fossombronia caespitiformis* (Spanish frillwort) | NS | - | 1950-2008 | 5 |
| *Fossombronia fimbriata* (fragile frillwort) | NR/NT | - | 1950-2008 | 4 |
| ***Fossombronia foveolata* (pitted frillwort)** | **NS/?** | **42*** | 1950-2008 | 7 |
| *Fossombronia husnotii* (Husnot's frillwort) | NS | - | 1950-2008 | 6 |
| *Fossombronia incurva* (weedy frillwort) | NS | - | 1950-2008 | 14 |
| *Fossombronia maritima* (sea frillwort) | NS/NT | - | 1950-2008 | 3 |
| *Funaria muhlenbergii* (Muhlenberg's cord-moss) | NS | - | 1950-2008 | 10 |
| ***Funaria pulchella* (Pretty Cord-moss)** | **NR/VU** | **42*** | 1950-2008 | 8 |
| *Glyphomitrium daviesii* (black-tufted moss) | NS | - | 1950-2008 | 2 |
| *Grimmia arenaria* (sand grimmia) | NR/VU | - | 1950-2008 | 7 |
| *Grimmia atrata* (copper grimmia) | NS | - | 1950-2008 | 7 |
| *Grimmia decipiens* (great grimmia) | NS | - | 1950-2008 | 8 |
| ***Grimmia elongata* (brown grimmia)** | **NR/EN** | **42*** | 1950-2008 | 5 |
| *Grimmia incurva* (black grimmia) | NS | - | 1950-2008 | 7 |
| *Grimmia laevigata* (hoary grimmia) | NS | - | 1950-2008 | 13 |
| *Grimmia longirostris* (north grimmia) | NS | - | 1950-2008 | 2 |
| *Grimmia montana* (sun grimmia) | NS | - | 1950-2008 | 3 |
| *Grimmia orbicularis* (round-fruited grimmia) | NS | - | 1950-2008 | 16 |
| *Grimmia ovalis* (flat-rock grimmia) | NS | - | 1950-2008 | 19 |
| *Grimmia sessitana* (alpine grimmia) | NR/VU | - | 1950-2008 | 1 |
| *Gymnocolea acutiloba* (Welsh notchwort) | NR/VU | - | 1950-2008 | 3 |
| *Gymnostomum calcareum* (blunt-leaf tufa-moss) | NS | - | 1950-2008 | 3 |
| *Gymnostomum viridulum* (Luisier's tufa-moss) | NS | - | 1950-2008 | 18 |

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|---|---|---|---|---|
| *Gymnomitrion crenulatum* (Western Frostwort) | - | - | 1950-2008 | 21 |
| ***Habrodon perpusillus* (Lesser Squirrel-tail Moss)** | **NS/EN** | **42*** | 1950-2008 | 4 |
| *Hamatocaulis vernicosus* (Slender Green Feather-Moss) | NS | S. 8 | 1950-2008 | >50 |
| *Haplomitrium hookeri* (Hooker's flapwort) | NS | - | 1950-2008 | 6 |
| *Hedwigia ciliata* (fringed hoar-moss) | NR/NT | - | 1950-2008 | 9 |
| *Hedwigia integrifolia* (green hoar-moss) | NS | - | 1950-2008 | 15 |
| *Hygrohypnum duriusculum* (broad-leaved brook-moss) | NS | - | 1950-2008 | 4 |
| *Hypnum hamulosum* (hook-leaved plait-moss) | NS | - | 1950-2008 | 5 |
| *Hypnum imponens* (pellucid plait-moss) | NS | - | 1950-2008 | 3 |
| *Isopterygiopsis muelleriana* (Mueller's silk-moss) | NS | - | 1950-2008 | 2 |
| *Jamesoniella autumnalis* (autumn flapwort) | NS | - | 1950-2008 | 21 |
| *Jungermannia borealis* (northern flapwort) | NS | - | 1950-2008 | 4 |
| *Jungermannia caespiticia* (delicate flapwort) | NR/VU | - | 1950-2008 | 2 |
| *Jungermannia confertissima* (kidney flapwort) | NS | - | 1950-2008 | 1 |
| *Jungermannia subelliptica* (two-lipped flapwort) | NS | - | 1950-2008 | 5 |
| *Kiaeria blyttii* (Blytt's fork-moss) | NS | - | 1950-2008 | 12 |
| *Kiaeria falcata* (sickle-leaved fork-moss) | NS | - | 1950-2008 | 1 |
| *Leiocolea fitzgeraldiae* (Fitzgerald's notchwort) | NR/NT | - | 1950-2008 | 1 |
| *Leiocolea heterocolpos* (ragged notchwort) | NS | - | 1950-2008 | 10 |
| *Lepidozia pearsonii* (Pearson's fingerwort) | - | - | 1950-2008 | 20 |
| *Leptobarbula berica* (Beric beard-moss) | NS | - | 1950-2008 | 3 |
| **+*Leptodon smithii* (Prince of Wales feather-moss)** | **?** | **42*** | 1950-2008 | 7 |
| *Leptoscyphus cuneifolius* (wedge flapwort) | NS | - | 1950-2008 | 2 |
| *Leucobryum juniperoideum* (smaller white moss) | NS | - | 1950-2008 | 32 |
| *Lophozia longidens* (horned flapwort) | NS | - | 1950-2008 | 1 |
| *Marsupella adusta* (scorched rustwort) | NS | - | 1950-2008 | 6 |
| *Marsupella alpina* (alpine rustwort) | NS | - | 1950-2008 | 4 |
| *Marsupella sphacelata* (speckled rustwort) | NS | - | 1950-2008 | 3 |
| *Marsupella stableri* (Stabler's rustwort) | NS | - | 1950-2008 | 2 |
| *Meesia uliginosa* (broad-nerved hump-moss) | NS | - | 1950-2008 | 1 |
| *Microbryum floerkeanum* (Floerke's phascum) | NS | - | 1950-2008 | 1 |
| *Microbryum starckeanum* (Starke's pottia) | NS | - | 1950-2008 | 17 |
| *Mnium thomsonii* (short-beaked thyme-moss) | NS | - | 1950-2008 | 2 |
| *Moerckia hibernica* (Irish ruffwort) | NS | - | 1950-2008 | 14 |
| *Molendoa warburgii* (Warburg's moss) | - | - | 1950-2008 | 4 |
| *Myrinia pulvinata* (flood-moss) | NS/NT | - | 1950-2008 | 8 |
| *Nardia geoscyphus* (earth-cup flapwort) | NS | - | 1950-2008 | 6 |
| *Octodiceras fontanum* (fountain pocket-moss) | NS | - | 1950-2008 | 2 |
| *Oedipodium griffithianum* (gouty-moss) | NS | - | 1950-2008 | 18 |
| *Orthothecium rufescens* (red leskea) | NS | - | Pre-1950 | 2 |
| *Orthotrichum sprucei* (Spruce's bristle-moss) | - | - | 1950-2008 | 28 |
| ***Pallavicinia lyellii* (veilwort)** | **NS** | **42*** | 1950-2008 | 7 |
| *Paraleptodontium recurvifolium* (drooping-leaved beard-moss) | NS | - | 1950-2008 | 2 |
| ***Petalophyllum ralfsii* (Petalwort)** | **NS** | **42*; S. 8** | 1950-2008 | 17 |
| *Phaeoceros carolinianus* (a hornwort) | NR/NT | - | 1950-2008 | 5 |
| *Philonotis rigida* (rigid apple-moss) | NS | - | 1950-2008 | 6 |
| *Philonotis seriata* (spiral apple-moss) | NS | - | 1950-2008 | 1 |
| *Philonotis tomentella* (wooly apple-moss) | NR | - | 1950-2008 | 1 |
| *Physcomitrium sphaericum* (dwarf bladder-moss) | NR/NT | - | 1950-2008 | 2 |
| *Plagiochila atlantica* (western featherwort) | NS | - | 1950-2008 | 3 |
| *Plagiochila punctata* (Spotty Featherwort) | - | - | 1950-2008 | 49 |
| *Plagiopus oederianus* (Oeder's apple-moss) | NS | - | 1950-2008 | 18 |
| *Plagiothecium cavifolium* (round silk-moss) | NS | - | 1950-2008 | 5 |
| *Plagiothecium laetum* (bright silk-moss) | NS | - | 1950-2008 | 20 |

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|---|---|---|---|---|
| *Plagiothecium platyphyllum* (alpine silk-moss) | NS | - | 1950-2008 | 2 |
| *Plagiothecium ruthei* (swamp silk moss) | NS | - | 1950-2008 | 10 |
| *Platydictya jungermannioides* (Spruce's leskea) | NS | - | 1950-2008 | 7 |
| *Platygyrium repens* (flat-brocade moss) | NS | - | 1950-2008 | 7 |
| *Pleurochaete squarrosa* (side-fruited crisp-moss) | NS | - | 1950-2008 | 19 |
| *Pohlia elongata polymorpha* (changeable thread-moss) | NS | - | 1950-2008 | 1 |
| *Pohlia flexuosa* (orange-bud thread-moss) | NS | - | 1950-2008 | 23 |
| *Pohlia lescuriana* (pretty nodding-moss) | NS | - | 1950-2008 | 12 |
| *Pohlia ludwigii* (Ludwig's thread-moss) | NS | - | 1950-2008 | 1 |
| *Porella obtusata* (broad scalewort) | NS | - | 1950-2008 | 15 |
| *Porella pinnata* (pinnate scalewort) | NS | - | 1950-2008 | 43 |
| *Pottiopsis caespitosa* (round-fruited pottia) | NS | - | 1950-2008 | 1 |
| *Pseudobryum cinclidioides* (river thyme-moss) | NS | - | 1950-2008 | 9 |
| *Pseudoleskeella catenulata* (chained leskea) | NS | - | 1950-2008 | 1 |
| *Pterygoneurum ovatum* (oval-leaved pottia) | NS/DD | - | -1949 | 3 |
| *Pylaisia polyantha* (many-flowered leskea) | NS | - | 1950-2008 | 5 |
| *Racomitrium affine* (lesser fringe-moss) | NS | - | 1950-2008 | 35 |
| *Racomitrium canescens* (hoary fringe-moss) | NS | - | 1950-2008 | 10 |
| *Racomitrium elongatum* (long fringe-moss) | NS | - | 1950-2008 | 39 |
| *Racomitrium macounii* (Macoun's fringe-moss) | NR/NT | - | 1950-2008 | 4 |
| *Racomitrium sudeticum* (slender fringe-moss) | NS | - | 1950-2008 | 22 |
| *Radula voluta* (pale scalewort) | NS | - | 1950-2008 | 8 |
| *Rhabdoweisia crenulata* (greater streak moss) | NS | - | 1950-2008 | 26 |
| *Rhynchostegiella curviseta* (curve-stalked feather-moss) | NS | - | 1950-2008 | 1 |
| *Rhynchostegium alopecuroides* (Portuguese feather-moss) | NS | - | 1950-2008 | 35 |
| ***Rhytidiadelphus subpinnatus* (scarce turf-moss)** | **NR/EN** | **42*** | 1950-2008 | 4 |
| *Rhytidium rugosum* (wrinkle-leaved feather-moss) | NS | - | 1950-2008 | 2 |
| *Riccardia incurvata* (lesser germanderwort) | NS | - | 1950-2008 | 10 |
| *Riccia beyrichiana* (purple crystalwort) | NS | - | 1950-2008 | 19 |
| ***Riccia canaliculata* (channelled crystalwort)** | **NR/VU** | **42*** | 1950-2008 | 1 |
| *Riccia cavernosa* (cavernous crystalwort) | NS | - | 1950-2008 | 9 |
| *Riccia crozalsii* (ciliate crystalwort) | NS | - | 1950-2008 | 1 |
| *Riccia huebeneriana* (violet crystalwort) | NS | - | 1950-2008 | 9 |
| ***Riccia nigrella* (black crystalwort)** | **NR/EN** | **42*** | 1950-2008 | 3 |
| *Riccia subbifurca* (least crystalwort) | NS | - | 1950-2008 | 34 |
| *Ricciocarpos natans* (fringed heartwort) | NS | - | 1950-2008 | 3 |
| *Scapania aequiloba* (lesser rough earwort) | NS | - | 1950-2008 | 7 |
| *Scapania calcicola* (calcicolous earwort) | NS | - | 1950-2008 | 1 |
| *Scapania cuspiduligera* (untidy earwort) | NS | - | 1950-2008 | 8 |
| *Scapania gymnostomophila* (narrow-lobed earwort) | NR/NT | - | 1950-2008 | 2 |
| *Scapania lingulata* (tongue earwort) | NS | - | 1950-2008 | 6 |
| *Scapania ornithopodioides* (bird's-foot earwort) | NS | - | 1950-2008 | 2 |
| *Scapania paludicola* (bog earwort) | NR/NT | - | 1950-2008 | 15 |
| *Scapania paludosa* (floppy earwort) | NR | - | 1950-2008 | 11 |
| *Scapania uliginosa* (marsh earwort) | NS | - | 1950-2008 | 5 |
| *Schistidium agassizii* (water grimmia) | NS | - | 1950-2008 | 2 |
| ***Scopelophila cataractae* (tongue-leafed copper-moss)** | **NR/VU** | **42*** | 1950-2008 | 2 |
| *Seligeria acutifolia* (sharp rock-bristle) | NS | - | 1950-2008 | 9 |
| *Seligeria brevifolia* (short rock-bristle) | NR/VU | - | 1950-2008 | 1 |
| *Seligeria campylopoda* (bentfoot rock-bristle) | NR/VU | - | 1950-2008 | 5 |
| *Seligeria donniana* (Donn's rock-bristle) | NS | - | 1950-2008 | 6 |
| *Seligeria pusilla* (dwarf rock-bristle) | NS | - | 1950-2008 | 14 |
| *Seligeria trifaria* (trifid rock-bristle) | DD | - | 1950-2008 | 2 |
| *Sematophyllum demissum* (prostrate signal-moss) | NR/VU | - | 1950-2008 | 4 |

| A Draft List of Scarce and Rare Bryophytes recorded in Wales | GB/IUCN RDB[2] Status | S.42* list; W&CA Sch. 8 | Date range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| *Sematophyllum micans* (sparkling signal-moss) | NS | - | 1950-2008 | N. Wales |
| *Southbya tophacea* (green blackwort) | NR/VU | - | 1950-2008 | 6 |
| *Sphaerocarpos michelii* (Micheli's balloonwort) | NS | - | 1950-2008 | ? |
| *Sphaerocarpos texanus* (Texas balloonwort) | NS/VU | - | 1950-2008 | ? |
| *Sphagnum affine* (imbricate bog-moss) | NS | - | 1950-2008 | 10 |
| *Sphagnum angustifolium* (fine bog-moss) | NS | - | 1950-2008 | 27 |
| *Sphagnum austinii* (Austin's bog-moss) | NS | - | 1950-2008 | 3 |
| *Sphagnum flexuosum* (flexuous bog-moss) | NS | - | 1950-2008 | 35 |
| *Sphagnum platyphyllum* (flat-leaved bog-moss) | NS | - | 1950-2008 | 17 |
| *Sphagnum pulchrum* (golden bog-moss) | NS | - | 1950-2008 | 3 |
| *Sphagnum subsecundum* (slender cow-horn bog-moss) | NS | - | 1950-2008 | 29 |
| *Sphenolobopsis pearsonii* (horsehair threadwort) | NS | - | 1950-2008 | 18 |
| *Syntrichia princeps* (brown screw-moss) | NS | - | 1950-2008 | 2 |
| *Syntrichia virescens* (lesser screw-moss) | NS | - | 1950-2008 | 3 |
| *Targionia hypophylla* (orobus-seed liverwort) | NS | - | 1950-2008 | 11 |
| *Thuidium abietinum abietinum* (fir tamarisk-moss) | NS | - | 1950-2008 | 5 |
| *Tomentypnum nitens* (woolly feather-moss) | NS | - | 1950-2008 | 6 |
| *Tortula atrovirens* (rib-leaf moss) | NS | - | 1950-2008 | 19 |
| *Tortula canescens* (dog screw-moss) | NS | - | 1950-2008 | 2 |
| ***Tortula cuneifolia* (Wedge-leaved Screw-moss)** | **NR/EN** | **42*** | 1950-2008 | 2 |
| *Tortula viridifolia* (bristly pottia) | NS | - | 1950-2008 | 36 |
| ***Tortula wilsonii* (Wilson's Pottia)** | **NS/EN** | **42*** | 1950-2008 | 5 |
| *Ulota calvescens* (balding pincushion) | NS | - | -1949 | 2 |
| *Ulota coarctata* (club pincushion) | NS | - | -1949 | 2 |
| ***Weissia levieri* (Levier`s Beardless-moss)** | **EN** | **42*** | 1950-2008 | 2 |
| *Weissia perssonii* (Persson's stubble-moss) | NS | - | 1950-2008 | 21 |
| *Weissia rostellata* (beaked beardless-moss) | NS | - | 1950-2008 | 8 |
| ***Weissia squarrosa* (Spreading-leaved Beardless-moss)** | **NS/VU** | **42*** | 1950-2008 | 2 |
| *Weissia sterilis* (sterile beardless-moss) | NS/VU | - | 1950-2008 | 1 |

**Table 14(b) <u>A Draft List of Bryophyte species previous recorded but thought to be extinct in Wales at the present time</u> (**after Common Standards Monitoring for Bryophytes and Lichens (July 2005); Wales Biodiversity Species Audit (2003)[1]; and National Biodiversity Network Gateway/ Bryophyte data for Great Britain from the British Bryological Society[3] **)**

| Bryophyte species previous recorded but thought to be extinct in Wales at the present time | GB/IUCN RDB Status | S.42* list; S.8 | Date range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| ***Andreaea nivalis* (Snow Rock-moss)** | **NS/VU** | **W.list*** | -1949 | 1 |
| *Bryum neodamense* (long-leaved thread-moss) | NS/DD | S. 8 | -1949 | 1 |
| *Bryum uliginosum* (cernuous thread-moss) | NR/CR | - | -1949 | 2 |
| *Cinclidium stygium* (lurid cupola-moss) | NS | - | -1949 | 1 |
| *Ceratodon conicus* (scarce redshank) | NR/CR | - | 1950-2008 | ? |
| *Cinclidotus riparius* (fountain lattice-moss) | NR/VU | - | 1950-2008 | ? |
| *Conostomum tetragonum* (helmet-moss) | NS | - | -1949 | 1 |
| *Dicranella crispa* (curl-leaved forklet-moss) | NS | - | -1949 | 1 |
| *Dicranum spurium* (rusty fork-moss) | NS/VU | - | ? | ? |
| *Diplophyllum taxifolium* (alpine earwort) | NS | - | -1949 | 1 |
| *Encalypta alpina* (alpine extinguisher-moss) | NS | - | -1949 | 1 |
| *Encalypta rhaptocarpa* (ribbed extinguisher-moss) | NS | - | -1949 | 1 |
| *Gymnomitrion corallioides* (coral frostwort) | NR/NT | - | -1949 | 1 |
| ***Micromitrium tenerum* (Millimetre Moss)** | **NR/CR** | **W.list*S8** | -1949 | 1 |
| *Myurella julacea* (small mouse-tail moss) | NS | - | -1949 | 1 |

| Bryophyte species previous recorded but thought to be extinct in Wales at the present time | GB/IUCN RDB Status | S.42* list; S.8 | Date range[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| ***Orthodontium gracile*** **(Slender Thread-moss)** | **NR/VU** | **W.list*** | -1949 | 3 |
| ***Philonotis cernua*** **(Swan-necked Apple-moss)** | **NR/CR** | **W.list*** | -1949 | 1 |
| *Pterigynandrum filiforme* (capillary wing-moss) | NS | - | -1949 | 3 |
| *Scapania nimbosa* (cloud earwort) | NS | - | -1949 | 1 |
| *Schistidium trichodon* (stook grimmia) | NS | - | -1949 | 1 |
| ***Sphagnum balticum*** **(Baltic Bog-moss)** | **NR/EN** | **W.list*** | -1949 | 1 |
| *Tetraplodon angustatus* (narrow cruet-moss) | NS | - | -1949 | 1 |
| ***Tortula vahliana*** **(chalk screw-moss)** | NR/VU | - | ? | ? |
| ***Weissia multicapsularis*** **(Many-fruited Beardless-moss)** | **NR/CR** | **W.list*** | -1949 | 1 |
| ***Weissia sterilis*** **(Sterile Beardless-moss)** | **NS/VU** | **W.list*** | -1949 | 1 |
| *Zygodon forsteri* (knothole yoke-moss) | NR/EN | S. 8 | ? | ? |

**Table 14(c) <u>A Draft List of Bryophyte species previous recorded in Wales but now thought to be extinct in UK</u> (**after Common Standards Monitoring for Bryophytes and Lichens (July 2005) and National Biodiversity Network Gateway/ Bryophyte data for Great Britain from the British Bryological Society[3] **)**

| Bryophyte species previous recorded in Wales but now thought to be extinct in UK | GB RDB Status | S.42* list | Date class[3] | No of hectads[3] in Wales |
|---|---|---|---|---|
| *Bryum turbinatum* (topshape thread-moss) | EX | - | -1949 | 4 |
| *Pterygoneurum lamellatum* (spiral chalk-moss) | EX | - | ? | ? |

## S9) <u>FUNGI</u>

There is an enormous diversity of fungi, ranging from the several thousand "larger" fungi (e.g. toadstools, bracket fungi, earth stars, stinkhorns, fairy clubs, puffballs, earthtongues, etc), to the even more numerous moulds, rusts and yeasts, amounting to at least 10,000 species within the UK. Unfortunately, the status of even the higher fungus species are relatively poorly known, largely due to the bewildering species diversity, the difficulty of making identifications, and the irregular and ephemeral appearance of the fruiting bodies that make identification possible. However, it is known that not only do fungi play crucial roles in ecosystems, they are often excellent indicators of ecological quality, whilst many species appear to be highly localised in their distribution, or suffering significant declines.

Our knowledge of Wales' fungi is improving steadily over time, but it is undoubtedly still poor, as is the norm for virtually all of the UK. However; this poor state of knowledge is no reason for ignoring fungi as important considerations for the selection of Wildlife Sites in Wales, given the need for action for all our biodiversity, coupled with the ecological importance and sensitivity of fungi.

The need to include specific guidelines for the selection of Wildlife Sites based on the presence of fungi is exemplified by the unimproved grassland fungi communities found in Wales. These fungi, including waxcaps (*Hygrocybe spp.*), fairy clubs (*Clavaria spp.*) and earthtongues (*Geoglossum spp.* and allies) and species from genera such as *Entoloma* and *Leptonia*, are now recognised to be very sensitive to grassland improvement. In recent years it has become clear that a number of sites in Wales are amongst the very best in Europe for grassland fungi. Many of these sites, whilst never having been fertilised or resown, are heavily sheep grazed year-round, and are of limited apparent vascular plant interest as a result. The fact that these pastures show themselves as important "waxcap grasslands" in

autumn has been over-looked by most nature conservationists for years, yet they represent one of the habitats for which Wales has perhaps the greatest international responsibility.

The number of waxcap species present has been used as the basis for identifying important grassland fungi sites as this is becoming an accepted evaluation methodology across Europe. The application of these guidelines is helped by the relative ease in which waxcap species can be identified by careful field observation, assisted by recent developments in taxonomic treatment and identification methods. Boertmann (1996) should be taken as the definitive treatment of the genus, with the species count being of those species recognised by Boertmann (other authors treat some of the within-species forms of Boertmann as distinct species).

With the increasing importance of the fungal fruiting diversity is being recognised, the British Mycological Society (BMS) initiated surveys of fungi that characterise unimproved meadows and grasslands (Rotheroe, 1999). This work has produced a classification (also called the CHEG profile) based upon the numbers of the species of:

| | |
|---|---|
| Clavaroid fungi (fairy clubs) | **C** |
| *Hygrocybe* (waxcaps) | **H** |
| Entolomataceae grassland spp. (pink-gills) | **E** |
| Geoglossaceae (earth-tongues) | **G** |

Thus, a site recording 3 species of fairy clubs, 6 waxcaps, 1 *Leptonia* and 1 earth-tongue, would be described as C3, H6, E1, G1. This simple quantification method has been combined by Rotheroe (1999) with the Rald (Rald, 1985) classification, which uses the total number of *Hygrocybe* spp. recorded from a site to define it as of:

| | |
|---|---|
| National Importance (I) | 17-32 (11-20 during a single visit) |
| Regional Importance (II) | 9-16 (6-10 during a single visit) |
| Local Importance (III) | 4-8 (3-5 during a single visit) |
| No Importance (IV) | 1-3 (1-2 during a single visit) |

By combining the two systems, sites are initially ranked in order of importance according to their Rald (1985) data. The CHEG classification and presence of any Red Data List species (Evans, S., Henrici, A. and Ing, B.,2007) then allows refinement of the conservation priority when a large number of sites are being compared. It should be stated that this type of assessment is based upon fruiting data alone and this can vary significantly year to year depending upon the weather conditions (Straatsma *et al.*, 2001). Therefore a full evaluation can only be made following several years assessment.

A further group of fungi which are likely to be of very significant conservation importance are species restricted to other ancient habitats such as wetlands and woodlands. The species associated with veteran trees, especially where they occur on a site that is likely to have had a long historical continuity of large diameter decaying timber available are also likely to contain rare species and/or important assemblages.

A red data list of Fungi was produced in 1992 by the British Mycological Society, and this has been revised in 2007, Evans, S., Henrici, A. and Ing, B. (2007) and has been used as the basis of Table 15. The RDB status of fungi is slightly different from other taxa, and is given in full below:

| CATEGORY | Category/Criteria | Hectads since 1960 | Criteria required byIUCN |
|---|---|---|---|
| EXTINCT | Extinct | None | Date of last record |
| CRITICALLY ENDANGERED | Critically Endangered/B | 1 | Decline |
| ENDANGERED | Endangered/B | 2 - 5 | Decline |
| VULNERABLE | Vulnerable/B | 6 - 10 | Decline |
| | Vulnerable/D2 | 1 - 5 | No Decline |
| NEAR THREATENED | Near Threatened | 6- 10 | No Decline |
| | | 11 - 20 | Host or Habitat Threatened |

The development of lists of locally rare fungi is progressing. However, the recognition of locally rare species is fundamental to the Wildlife Site concept, hence this criterion is still recognised. Great care will need to be taken with its application in the absence of objective lists of locally rare species. At present, these guidelines should only being used in the exceptional situations where there is a clear consensus amongst experts that a species is rare.

The guidelines do not attempt to allow designation of Wildlife Sites on the basis of overall larger fungi diversity. Fungus recording has not been extensive or systematic enough in Wales for this to be usefully applied to the selection of Wildlife Sites. It is hoped that particularly diverse sites for fungi will be picked up by other Wildlife Site Guidelines, either relating to fungi, other taxa, or general vegetation characteristics.

Further useful information included the Fungal Records Database of Britain and Ireland, which provides vice county records and contacts for local fungi recording groups is available from the British Mycological Society website. www.britmycolsoc.org.uk/ , and a general account of fungi is available in Spooner, B. and Roberts, P. (2005).

The following should be considered for selection:

- All non-designated grassland sites supporting 4-8 or more species of waxcap *Hygrocybe* spp., (3-5 during a single visit).

- Any non-designated site which supports a species, which is listed in the British Mycological Society red data list of Fungi (Evans, S., Henrici, A. and Ing, B., 2007) or in the Section 42 List with the specific requirement for site protection action (WAG, 2008), see table 15.

- Any non-designated site which supports a species recorded from 10 or fewer 10km grid squares in Wales (where the distribution is well known), see Table 15.

- Any non-designated site which supports a species which is recorded from 3 or fewer sites within a Watsonian Vice County (where the distribution is well known).

- Any non-designated site which supports a significant population of a Local Priority Species as listed in the relevant Local Biodiversity Action Plan.

Table 15 **A draft list of scarce and rare fungi recorded in Wales (**after Wales Assembly Government (2008); Wales Biodiversity Species Audit (2003)[1]; Evans, S., Henrici, A. and Ing, B. (2007[2]) and National Biodiversity Network Gateway/ Fungal Records Database of Britain and Ireland[3] **)**

| **A draft list of scarce and rare fungi recorded in Wales**<br><br>**+ Wales only S 42 fungi species** | GB RDB[2] Status; **S42* list** | **W&CA** | **Date Range[2]** | **No of hectads[3] in Wales** |
|---|---|---|---|---|
| *Agaricus xanthodermus var. lepiotoides* (scurfy yellow stainer) | VU | - | 1960-2008 | 1 |
| *Agrocybe pediades* (common fieldcap) | VU | - | 1960-2008 | 9 |
| ***Amanita friabilis* (fragile amanita)** | **EN/B*** | - | 1960-2008 | 2 |
| *Amanita lividopallescens* (an amanita) | NT | - | 1960-2008 | 2 |
| *Amanita nivalis* (mountain grisette) | VU/B | - | 1960-2008 | 1 |
| ***Armillaria ectypa* (marsh honey fungus)** | **EN/B*** | - | 1960-2008 | 1 |
| *Boletus fechtneri* (pale bolete) | NT | - | 1960-2008 | 2 |
| *Boletus pseudoregius* (the pretender) | NT | - | 1960-2008 | 1 |
| *Boletus satanas* (devil's bolete) | Rare | - | 1960-2008 | 1 |
| *Bovista limosa* (least bovist) | NT | - | 1960-2008 | 6 |
| *Buchwaldoboletus lignicola* (wood bolete) | VU/D2 | - | 1960-2008 | 6 |
| ***Camarophyllopsis micacea* (yellow stemmed waxcap)** | **VU/B*** | - | 1960-2008 | 2 |
| *Camarops polysperma* | NT | - | 1960-2008 | 3 |
| *Cantharellus ferruginascens* (pale chanterelle) | NT | - | 1960-2008 | 1 |
| ***Chrysomyxa pirolata* (wintergreen rust)** | **EN/B*** | - | 1960-2008 | ? |
| *Clavaria incarnata* (a fairy cup) | NT | - | 1960-2008 | 6 |
| *Clavaria purpurea* (purple spindles) | EN/B | - | 1960-2008 | 1 |
| *Clavaria straminea* (straw club) | NT | - | 1960-2008 | 6 |
| **+ *Clavaria zollingeri* (violet coral)** | **?*** | - | 1960-2008 | 11 |
| *Coprinopsis ammophilae* (dune inkcap) | VU/B | - | 1960-2008 | 5 |
| *Coprinus sterquilinus* | VU/B | - | 1960-2008 | 1 |
| *Cortinarius camphorates* (goatcheese webcap) | NT | - | 1960-2008 | 1 |
| *Cortinarius limonius* (sunset webcap) | NT | - | 1960-2008 | 1 |
| *Cortinarius olearioides* | VU/B | - | pre-1960 | 4 |
| *Cortinarius orellanus* (fool's webcap) | VU/B | - | 1960-2008 | 2 |
| *Cortinarius porphyropus* (incl. *A. porphyropus*) | NT | - | 1960-2008 | 1 |
| *Cortinarius splendens* (splendid webcap) | NT | - | 1960-2008 | 1 |
| *Cortinarius violaceus* (violet webcap) | NT | - | 1960-2008 | 3 |
| *Cryptomyces maximus* (willow blister) | VU/D2 | - | 1960-2008 | 1 |
| *Cyathus stercoreus* (dung bird's nest) | NT | - | 1960-2008 | 6 |
| *Cystoderma cinnabarinum* | NT | - | 1960-2008 | 1 |
| ***Cotylidia pannosa* (wooly rosette)** | **EN/B*** | - | 1960-2008 | 1 |
| *Cotylidia undulate* (stalked rosette) | VU/D2 | - | 1960-2008 | 1 |
| *Cribraria microcarpa* (a slime mould) | VU[1] | - | 1960-2008 | 2 |
| ***Dendrocollybia racemosa* (branched shanklet)** | NT* | - | 1960-2008 | 1 |
| *Diderma lucidum* (a slime mould) | VU[1] | - | 1960-2008 | 1 |
| *Diderma ochraceum* (a slime mould) | VU[1] | - | 1960-2008 | 9 |
| *Entoloma aethiops* | VU/D2 | - | 1960-2008 | 1 |
| ***Entoloma bloxamii* (big blue pinkgill)** | **EN/B*** | - | 1960-2008 | 7 |
| *Entoloma tjallingiorum* | VU/D2 | - | 1960-2008 | 1 |
| *Entyloma eryngii* (sea holly smut) | EN/B | - | 1960-2008 | 3 |
| *Eocronartium muscicola* | VU/D2 | - | 1960-2008 | 1 |
| *Geastrum corollinum* (weathered earthstar) | EN/B | - | 1960-2008 | 2 |
| ***Geastrum elegans* (elegant earthstar)** | **EN/B*** | | 1960-2008 | 2 |
| *Geastrum fornicatum* arched earthstar) | VU | - | 1960-2008 | 7 |
| *Geastrum lageniforme* (flask earthstar) | NT | - | 1960-2008 | 2 |
| ***Geoglossum atropurpureum* (dark-purple earthstar)** | **Rare*** | | 1960-2008 | 5 |

| **A draft list of scarce and rare fungi recorded in Wales**<br><br>**+ Wales only S 42 fungi species** | GB RDB[2] Status; **S42* list** | **W&CA** | **Date Range[2]** | **No of hectads[3] in Wales** |
|---|---|---|---|---|
| *Geoglossum starbaeckii* | NT | - | 1960-2008 | 1 |
| *Gyrodon lividus* (alder bolete) | NT | - | 1960-2008 | 5 |
| *Hebeloma vaccinum* (dun-coloured hebeloma) | VU[1] | - | 1960-2008 | 4 |
| *Helvella leucopus* | VU/B | - | 1960-2008 | 3 |
| ***Hericium erinaceum* (bearded tooth)** | **VU*** | Sch. 8 | 1960-2008 | 2 |
| ***Hohenbuehelia culmicola* (marram oyster)** | **VU/B*** | - | 1960-2008 | 1 |
| ***Hydnellum concrescens* (zoned tooth)** | **VU*** | - | 1960-2008 | 2 |
| *Hydnellum ferrugineum* (mealy tooth) | NT | - | 1960-2008 | 1 |
| ***Hydnellum scrobiculatum* (ridged tooth)** | **EN/B*** | - | 1960-2008 | 2 |
| ***Hydnellum spongiosipes* (velvet tooth)** | **Rare*** | - | 1960-2008 | 3 |
| *Hygrocybe calciphila* | NT | - | 1960-2008 | 2 |
| ***Hygrocybe spadicea* (date-coloured waxcap)** | **NT*** | - | 1960-2008 | 5 |
| ***Hypocreopsis lichenoides* (willow gloves)** | **CR/B*** | - | 1960-2008 | 1 |
| *Hygrophorus nemoreus* (oak woodwax) | NT | - | 1960-2008 | 2 |
| *Hygrophorus pudorinus* (rosy woodwax) | EN/B | - | 1960-2008 | 1 |
| *Inocybe arenicola* (sand fibrecap) | VU/D2 | - | 1960-2008 | 1 |
| *Inocybe vulpinella* (foxy fibrecap) | VU/D2 | - | 1960-2008 | 3 |
| *Lactarius mairei* | NT | - | 1960-2008 | 1 |
| *Leptoporus mollis* | ? | - | 1960-2008 | 1 |
| *Leucoagaricus barssii* | NT | - | 1960-2008 | 1 |
| *Leucocortinarius bulbiger* (white webcap) | NT | - | 1960-2008 | 1? |
| *Lycogala conicum* (a slime mould) | VU[1] | - | 1960-2007 | 4 |
| ***Microglossum olivaceum* (olive earthstar)** | **VU*** | | 1960-2008 | 19 |
| *Melanoleuca cinereifolia* (dune grey-gill) | VU[1] | - | 1960-2008 | 6 |
| *Melanoleuca schumacheri* (clouded cavalier) | NT | - | 1960-2008 | 3 |
| *Melanoleuca nivea* (a grey toadstool) | VU[1] | - | 1960-2008 | 4 |
| *Mycena latifolia* | NT | - | 1960-2008 | 1 |
| *Naucoria salicetorum* (a willow carr fungus) | VU[1] | - | 1960-2008 | 3 |
| *Omphalina galericolor* | VU/D2 | - | 1960-2008 | 2 |
| *Onygena equine* (horn stalkball) | NT | - | 1960-2008 | 1 |
| *Otidea cantharella* (a sulphur cup fungus) | VU/D2 | - | 1960-2008 | 1 |
| *Peziza gerardii* | VU/D2 | - | 1960-2008 | 2 |
| *Peziza vacini* | VU/D2 | - | 1960-2008 | 2 |
| *Phellinus robustus* (robust bracket) | VU/B | - | 1960-2008 | 2 |
| ***Phellodon confluens* (fused tooth)** | **EN/B*** | - | 1960-2008 | 1 |
| ***Phellodon melaleucus* (grey tooth)** | **VU*** | - | 1960-2008 | 7 |
| *Phellodon niger* (black tooth) | Rare | - | 1960-2008 | 1 |
| ***Phellodon tomentosus* (wooly tooth)** | **EN/B*** | - | 1960-2008 | 1 |
| ***Phylloporus pelletieri* (golden gilled bolete)** | **?*** | - | 1960-2008 | 2 |
| *Phyllotopsis nidulans* | NT | - | 1960-2008 | 2 |
| *Physarum didermoides* (a slime mould) | VU[1] | - | 1960-2008 | 3 |
| *Physarum psittacinum* (a slime mould) | VU[1] | - | 1960-2008 | 4 |
| *Physarum straminipes* (a slime mould) | EN[1] | - | Pre-1950 | 1 |
| *Pithya cupressina* | VU/D2 | - | 1960-2008 | 1 |
| ***Piptoporus quercinus* (oak polypore)** | **EN/B*** | Sch. 8 | 1960-2008 | 3 |
| *Polyporus umbellatus* (umbrella polypore) | NT | - | 1960-2008 | 2 |
| ***Poronia punctata* (nail fungus)** | **NT*** | | 1960-2008 | 4 |
| *Psathyrella caput-medusae* (medusa brittlestem) | VU/D2 | - | 1960-2008 | 1 |
| *Puccinia nemoralis* (cow-wheat clustercup rust) | VU/D2 | - | 1960-2008 | 1 |
| *Puccinia scirpi* | CR/B | - | 1960-2008 | 1 |
| ***Puccinia scorzonerae* (scorzonera rust)** | **CR/B*** | | 1960-2008 | 1 |
| *Ramaria aurea* | NT | - | 1960-2008 | 2 |
| *Ramaria broomei* | EN/B | - | 1960-2008 | 1 |

| **A draft list of scarce and rare fungi recorded in Wales**<br><br>**+ Wales only S 42 fungi species** | GB RDB[2] Status; **S42* list** | **W&CA** | **Date Range[2]** | **No of hectads[3] in Wales** |
|---|---|---|---|---|
| *Rimbachia bryophila* (a moss loving oyster mushroom) | NT | - | 1960-2008 | 1 |
| *Russula aurea* (gilded brittlegill) | NT | - | 1960-2008 | 5 |
| *Russula lilacea* | NT | - | 1960-2008 | 1 |
| *Russula melzeri* (scurfy brittlegill) | NT | - | 1960-2008 | 1 |
| *Russula rutila* | NT | - | 1960-2008 | 1 |
| *Spathularia flavida* (yellow fan) | NT | - | 1960-2008 | 11 |
| *Squamanita paradoxa* (powdercap strangler) | NT | - | 1960-2008 | 1 |
| *Tatraea dumbirensis* | VU/D2 | - | 1960-2008 | 1 |
| *Tilletia caries* | EN/B | - | 1960-2008 | 2 |
| *Tremella steidleri* (brown brain) | NT | - | 1960-2008 | 3 |
| ***Tremellodendropsis tuberose* (ashen coral)** | **VU*** | | 1960-2008 | ? |
| *Trichoglossum rasum* | VU/B | - | 1960-2008 | 1 |
| *Tricholoma inamoenum* | EX | - | 1960-2008 | 2? |
| *Tricholoma sulphurescens* (sulphur knight) | VU/D2 | - | 1960-2008 | 4 |
| ***Tulostoma melanocyclum* (scaly storkball)** | **EN/B*** | - | 1960-2008 | 1 |
| *Uredinopsis filicina* (beech fern rust) | Rare | - | 1960-2008 | 1 |
| ***Urocystis colchici* (colchicum smut)** | **CR/B*** | **-** | 1960-2008 | 1 |
| *Ustilago echinata* | VU/D2 | - | 1960-2008 | 1 |
| *Xylaria oxyacanthae* | VU/D2 | - | 1960-2008 | 1 |

## S10) CHAROPHYTES [STONEWORTS]

The Charophytes (Stoneworts) are among the largest and most complex of the green algae. The main axes (stems) have whorls of short lateral branchlets at intervals so the plants bear a superficial resemblance to *Equisetum* or *Ceratophyllum*. They are submerged species (although some are able to survive on wet mud, drying out for short periods) anchored to the substrate by rhizoids (hair-like filaments).

The following categories should be considered for selection:

- Any site which supports a species which is listed in the Red Data Books for Britain and Ireland : Stoneworts (Stewart, N.F. and Church J.M., 1993), or the Section 42 List with the specific requirement for site and/or habitat action (WAG, 2008).

- Any site, which supports a species, which is recorded from 3 or fewer sites within a Watsonian Vice County (where the distribution is well known), see Table 16.

- Any site that supports a significant population of a Local Priority Species listed in the Local Biodiversity Action Plan.

Some areas within Wales have been better recorded for charophytes than others, and where queries occur the appropriate recorder/specialist should be contacted.

**Table 16 A draft list of Charophyte species recorded in Wales (**after Wales Assembly Government (2008)*; JNCC (20071217)[2]; and National Biodiversity Network Gateway/CCW Stoneworts in Wales[3]**)**

| A draft list of Charophyte species recorded in Wales | GB/IUCN RDB Status[2] | S.42* list | Date range[3] | No hectads in Wales[3] |
|---|---|---|---|---|
| *Chara aculeolata* (hedgehog stonewort) | **NS** | **-** | 1983-2008 | 7 |
| ***Chara baltica* (Baltic stonewort)** | **VU** | **S42*** | 1983-2008 | 1 |
| ***Chara curta* (lesser bearded stonewort)** | **NS** | **S42*** | 1983-2008 | 1 |
| *Chara rudis* (rough stonewort) | NT | - | 1983-2008 | 1 |
| *Nitella flexilis* (smooth stonewort) | NS | - | 1983-2008 | 3 |
| ***Nitella gracilis* (slender stonewort)** | **VU** | **S42*** | 1983-2008 | 3 |
| *Nitella mucronata* (pointed stonewort) | NS | - | 1983-2008 | 3 |
| ***Nitella tenuissima* (dwarf stonewort)** | **EN** | **S42*** | 1983-2008 | 2 |
| ***Nitellopsis obtuse* (starry stonewort)** | **VU** | **S42*** | 1983-2008 | ? |
| *Tolypella glomerata* (clustered stonewort) | NS | **-** | 1983-2008 | 13 |

Table ? **The Section 42 (2008) list of Marine Species** (after Wales Biodiversity Species Audit (2003)[1]; JNCC, (20071217)[2]; and National Biodiversity Network Gateway**)**

| **The Section 42 (2008) list of Marine Species**<br>+ Wales only S42 species | **GB/IUCN RDB[2] Status S.42* list** | **W&CA** | **Date range[3]** | **No of hectads[3] in Wales** |
|---|---|---|---|---|
| *Aiptasia mutabilis* (trumpet anemone) | NSMS[1] | - | 1983-2008 | 2 |
| + ***Alkmaria romijni*** **(tentacled lagoon worm)** | **NSMS*** | Sch. 5 | 1983-2008 | 2 |
| ***Ammodytes marinus*** **(sandeel)** | * | - | - | |
| ***Anotrichium barbatum*** **(bearded red seaweed)** | **NRMS*** | - | 1983-2008 | 2 |
| + ***Arctica islandica*** **(Icelandic cyprine or ocean quahog)** | * | - | - | |
| ***Atrina fragilis*** **(fan mussel)** | * | Sch. 5 | 1963-2008 | 2 |
| ***Balaenoptera acutorostrata*** **(minke whale)** | **LC*** | Sch. 5 | - | |
| ***Balaenoptera physalus*** **(fin whale)** | **EN*** | Sch.. 5 | - | |
| *Balanophyllia regia* (scarlet and gold star-coral) | NSMS[1] | - | 1983-2008 | 4 |
| ***Caretta caretta*** **(loggerhead turtle)** | * | Sch. 5 | - | |
| *Caryophyllia inornata* (a solitary coral) | NRMS[1] | - | 1983-2007 | 5 |
| ***Cetorhinus maximus*** **(basking shark)** | * | Sch. 5 | - | |
| ***Clupea harengus*** **(herring)** | * | - | - | |
| ***Cruoria cruoriaeformis*** **(a red seaweed)** | **NSMS*** | - | 1983-2008 | 3 |
| ***Delphinus delphis*** **(common dolphin)** | * | Sch. 5 | | |
| ***Dermochelys coriacea*** **(leatherback turtle)** | * | Sch. 5 | | |
| ***Dermocorynus montagnei*** **(a red seaweed)** | * | - | 1983-2008 | 2 |
| ***Dipturus batisb*** **(common skate)** | * | - | | |
| ***Edwardsia timida*** **(burrowing anemone)** | **NSMS*** | - | 1983-2008 | 1 |
| ***Eunicella verrucosa*** **(pink sea-fan)** | **NSMS*** | Sch. 5 | | |
| ***Gadus morhua*** **(cod)** | * | - | | |
| ***Galeorhinus galeus*** **(tope shark)** | * | - | | |
| *Gelidiella calcicola* (a red seaweed) | NSMS[1] | - | 1983-2008 | 2 |
| ***Globicephala melas*** **(long-finned pilot whale)** | * | Sch. 5 | | |
| ***Grampus griseus*** **(Risso's dolphin)** | * | Sch. 5 | | |
| ***Haliclystus auricular*** **(a stalked jellyfish)** | * | - | | |
| *Hartlaubella gelatinosa* (a hydroid) | NSMS[1] | - | 1983-2008 | 2 |
| ***Hippocampus guttulatus*** **(long snouted seahorse)** | * | - | | |
| *Hoplangia durotrix* (a carpet coral) | NRMS[1] | - | 1983-2008 | 2 |
| ***Hyperodon ampullatus*** **(northern bottlenosed whale)** | **LC*** | Sch. 5 | | |
| ***Lagenorhynchus acutus*** **(Atlantic white-sided dolphin)** | * | Sch. 5 | | |
| ***Lagenorhynchus albirostris*** **(white-beaked dolphin)** | * | Sch. 5 | | |
| ***Lamna nasus*** **(porbeagle shark)** | * | - | | |
| ***Lithothamnion coralloides*** **(coral maerl)** | **NSMS*** | - | | |
| ***Lophius piscatorius*** **(sea monkfish)** | * | - | | |
| ***Lucernariopsis campanulata*** **(a stalked jellyfish)** | * | - | | |
| ***Megaptera novaeangliae*** **(humpbacked whale)** | **VU*** | - | | |
| ***Merlangius merlangus*** **(European hake)** | * | - | | |
| ***Merluccius merluccius*** **(ling)** | * | - | | |
| *Ophelia bicornis* (an polychaete worm) | NRMS[1] | - | 1983-2008 | 3 |
| ***Orcinus orca*** **(killer whale)** | **LC(cd)*** | Sch. 5 | | |
| ***Ostrea edulis*** **(native oyster)** | * | - | | |
| ***Padina pavonica*** **(peacock tail)** | **NSMS*** | - | | |
| ***Palinurus elephas*** **(crayfish, crawfish or spiny lobster)** | * | - | | |
| *Parazoanthus axinellae* (an anemone) | NSMS[1] | | 1983-2008 | 8 |
| ***Phocoena phocoena*** **(harbour porpoise)** | **VU*** | Sch. 5 | | |
| ***Phymatolithon calcareum*** **(common maerl)** | * | - | | |
| ***Pleuronectes platessa*** **(plaice)** | * | - | | |
| ***Prionace glauca*** **(blue shark)** | * | - | | |
| + ***Raja brachyuran*** **(blonde ray)** | * | - | | |

| **The Section 42 (2008) list of Marine Species**<br>+ Wales only S42 species | **GB/IUCN RDB[2] Status S.42* list** | **W&CA** | **Date range[3]** | **No of hectads[3] in Wales** |
|---|---|---|---|---|
| **+ *Raja clavata* (thornback ray or roker)** | * | - | | |
| ***Raja undulate* (undulating ray)** | * | - | | |
| ***Rostroraja alba* (white or bottlenosed skate)** | * | - | | |
| *Schmitzia hiscockiana* (a red seaweed) | NSMS[1] | - | 1983-2008 | 8 |
| ***Scomber scombrus* (mackerel)** | * | - | | |
| ***Solea vulgaris* (sole)** | * | - | | |
| ***Squalus acanthias* (spiny dogfish)** | * | - | | |
| ***Squatina squatina* (angel fish)** | * | - | | |
| ***Stenella coeruleoalba* (striped dolphin)** | **LC(cd)*** | Sch. 5 | | |
| ***Tenellia adspersa* (lagoon sea slug)** | **NRMS*** | Sch. 5 | | |
| ***Trachurus trachurus* (horse mackerel)** | * | - | | |
| ***Tursiops truncatus* (bottlenosed dolphin)** | * | Sch. 5 | | |
| *Ventrosia ventrosa* (a mud snail) | - | - | 1983-2008 | 5 |
| ***Ziphius cavirostris* (Cuvier`s beaked whale)** | * | Sch. 5 | | |

*GLOSSARY OF TERMS AND ABBREVIATIONS*

| | |
|---|---|
| **Archaeophyte:** | A plant that was introduced to our area by man (or arrived naturally from an area in which it was present as an introduction) and became naturalised before 1500 AD. |
| **BTO:** | British Trust for Ornithology |
| **CE** | **Critically Endangered.** A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria A to E. |
| **DAFOR:** | A description of the distribution of plant species used when carrying out a Phase 1 survey; Dominant, Abundant, Frequent, Occasional, Rare. |
| **DD** | **Data Deficient** A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that a threatened category is appropriate. |
| **DETR:** | Department for the Environment and Transport |
| **EBCC:** | European Bird Census Council |
| **EN** | **Endangered** Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Superseded by new IUCN categories in 1994, but still applicable to lists that have not been reviewed since 1994. |
| **Epiphytic:** | Growing on other plants (usually trees), without deriving or contributing nutritional benefit. |
| **Ericoid:** | A plant that is a member of the Ericaceae family, e.g. heather. |
| **EX** | **Extinct** Taxa which are no longer known to exist in the wild after repeated searches of their localities and other known likely places.Superseded by new IUCN categories in 1994, but still applicable to lists that have not been reviewed since 1994. |
| **Fluviomorphology:** | The flow characteristics of a watercourse, including its related physical features such as riffles & pools, waterfalls, weirs, dams, artificial embankments, meanders and ox-bow lakes, undercut banks, soft cliffs, and sand and shingle bars and beaches. |

| | |
|---|---|
| **HAPs:** | Habitat Action Plans. These are contained within Local Biodiversity Action Plans and describe the current status of priority habitats, setting targets and objectives for the management, restoration and/or creation of the habitat, and proposing the actions necessary to achieve them. |
| **Hectad** | 10 kilometre square |
| **HEGS:** | The Hedgerow Evaluation Grading System (Clements & Tofts 1992) |
| **IUCN** | International Union for the Conservation of Nature |
| **IWC:** | Irish Wildbird Conservancy |
| **JNCC:** | Joint Nature Conservancy Council |
| **LBAP**: | Local Biodiversity Action Plan. Every Unitary Authority has their own Local Biodiversity Action Plan which includes individual HAPs and SAPs that are specific to that Authority area. |
| **LC** | **Low Risk - Least Concern**. Taxa which do not qualify for Lower Risk (conservation dependent) or Lower Risk (near threatened) or (in Britain) Nationally Scarce |
| **LR(cd)** | **Low Risk – conservation dependant**. Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years. |
| **Littoral:** | Belonging to the seashore. |
| **NBN** | National Biodiversity Network |
| **NR** | **Nationally Rare** Occurring in 15 or fewer hectads in Great Britain |
| **NRMS** | **National Rare Marine Species** Species which occur in eight or fewer 10km X 10km grid squares containing sea (or water of marine saline influence) within the three mile territorial limit |
| **NS** | **Nationally Scarce** Taxa which are recorded in 16-100 hectads but not included in one of the Red List Categories |
| **NSMS** | **Nationally Scarce Marine Species** Species which occur in nine to 55 10km X 10km grid squares containing sea (or water of marine saline influence) within the three mile territorial limit |

| | |
|---|---|
| **NT** | **Near Threatened** Taxa which do not qualify for Lower Risk (conservation dependent), but which are close to qualifying for Vulnerable. In Britain, this category includes species which occur in 15 or fewer hectads but do not qualify as Critically Endangered, Endangered or Vulnerable. For Vascular Plants the best available evidence indicates that it is close to qualifying for a threatened category in the near future, based on observations of less than 10,000 individuals; a declining population in 30 or fewer sites and/or an observed or estimated decline in its Area of Occupancy and/or Extent of Occurrence of 20% between the two Atlas observation periods (1930-60 and 1987-99). (Jones, A.) |
| **NVC**: | National Vegetation Classification |
| **NVC communities:** | Plant communities as defined in the NVC, published in *British Plant Communities* (Rodwell et al), 1991. |
| **Oligotrophic:** | A water body containing few available nutrients; usually applied to water bodies or to soil water in peaty or hill areas where the underlying rocks are of low base status. |
| **Phase 1 Survey:** | A standardised methodology for classifying and mapping of wildlife habitats in Great Britain. |
| **PHW** | Priority Habitats of Wales, Jones, P. et al (2003) |
| **Rare** | Taxa with small populations that are not at present Endangered or Vulnerable, but are at risk. (In GB, this was interpreted as species which exist in fifteen or fewer 10km squares). Superseded by new IUCN categories in 1994, but still applicable to lists that have not been reviewed since 1994. |
| **RIGS:** | Regionally Important Geographical Sites |
| **RSPB:** | Royal Society for the Protection of Birds |
| **SAPs**: | Species Action Plans. These are contained within Local Biodiversity Action Plans and set out objectives and targets for the maintenance or enhancement of the populations and range of key species, and the actions necessary to achieve them. |
| **Saproxylic:** | An organism which is associated with rotting wood. Saproxylic communities encompasses an unusually high proportion of endangered or little known animals, fungi and other life-forms. |
| **SCARABBS:** | An acronym of Statutory Conservation Agencies and RSPB Annual Breeding Bird Survey |
| **SINCs**: | **Sites of Importance for Nature Conservation**. Also known as Wildlife Sites, Sites of Nature Conservation Interest (SNCI's), County Sites, Biological Heritage Sites, |

| | |
|---|---|
| | County Wildlife Sites and Locally Important Nature Conservation Site. |
| **SOC:** | Scottish Ornithologists Club |
| **SOTEAG:** | Shetland Oil Terminal Environmental Advisory Group |
| **SPG:** | Supplementary Planning Guidance |
| **SSSI:** | Site of Special Scientific Interest |
| **UK Biodiversity Group:** | The UK Group which has provided the overall strategic guidance to the UK Biodiversity Action Plan process with representatives from key sectors. |
| **UK BAP:** | United Kingdom Biodiversity Action Plan. The UK Government's plan for the protection and sustainable use of biodiversity, published in 1994. It represents a commitment to joint action nationwide through the securing and better use of resources. |
| **Unimproved:** | A habitat where species diversity has not been detrimentally affected by agricultural improvement, such as draining, fertilising, spraying or seeding. |
| **Veteran Trees:** | Are here defined as trees that are ≥3.7m circumference at 1.3m from base, or individuals that are estimated to be at least 200 years old which exhibit characteristics such as rot hollows, bracket fungi or a large proportion of dead wood. |
| **VU** | **Vulnerable** Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. Superseded by new IUCN categories in 1994, but still applicable to lists that have not been reviewed since 1994. |
| **WAG:** | Welsh Assembly Government |
| **WBPSG**: | Wales Biodiverity Partnership Steering Group |
| **WWT:** | The Wildfowl and Wetlands Trust |

## BIBLIOGRAPHY


**Alexander, K.N.A. (1999).** *The invertebrates of Britain's wood pastures*. British Wildlife **11**: 108-117.

**Altringham, J.D. (2003)** *British Bats*. Harper Collins

**Anon (1994)** *Biodiversity: The UK Action Plan*, HMSO

**Anon (2006)** *Guidelines for the Selection of SINCs in Caerphilly, Rhondda Cynon Taff and Caerphilly.* Unpublished

**Anon (2007)** *Species and Habitats Review Report 2007*. UK Biodiversity Partnership http://www.ukbap.org.uk/bapgrouppage.aspx?id=112

**Arnold, H.R. (1995).** *Atlas of Amphibians and Reptiles in Britain*. Institute of Terrestrial Ecology, Huntingdon.

**Asher, J., Warren, M., Fox, R., Harding, P., Jeffcoate, G. & Jeffcoate, S. (2001).** *The Millennium Atlas of Butterflies in Britain and Ireland.* Oxford University Press.

**Association of Local Government Ecologists (ALGE 1999).** *A Biodiversity Guide for the Planning and Development Sectors in Wales* (Consultation Draft, March 1999). ALGE (Wales Group), unpublished report.

**Atkinson, P.W, Austin, G.E., Burton, N.H.K., Musgrove, A.J., Pollit, M., & Rebfisch, M.M (2003).** *WeBs Alerts 1998/99: Changes in numbers of wintering waterbirds in the United Kingdom at national, country and Special Protection Area (SPA) scales*. BTO Research Report 239.

**Beebee, T. & Grayson, R. (1998).** Site assessment and protection ***In:*** Gent, A & Gibson, S (Eds.) *Herpetofauna Worker's Manual*. Joint Nature Conservation Committee.

**Beebee, T. and Griffiths, R. (2000)** *Amphibians and Reptiles*. Harper Collins.

**Birdlife International (2000).** *Threatened Birds of the World*. BirdLife International Lynx Editions.

**British Bryological Society, (2005)** Bryophyte Red List

**Bodé, G. (2004)** *Guidelines for the Selection of Wildlife Sites in South Wales* The South Wales Wildlife Sites Partnership, Dinglestow.

**Bosanquet, S.D.S. (2003).** *Monmouthshire Register of Rare Bryophytes*. Privately published.

**Bosanquet, S.D.S (2005), Graham J.J. and Motley, G.S. (2005).** *The Mosses and Liverworts of Carmarthenshire* Privately published.

**Boertmann, D. (1996).** The genus Hygrocybe. *Fungi of Northern Europe* – Vol **1**. Danish Mycological Society.

Butterfly Conservation (1998) *National Action Plan for Wales*, available at http://www.butterfly-conservation.org/

**Cantor, L. (1983).** *The Medieval Parks of England: A Gazetteer* [includes list for Wales]. Loughborough University of Technology.

**Cheffings, C.M. & Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. (2005).** *The Vascular Plant Red Data List for Great Britain. Species Status* **7**: 1-116. Joint Nature Conservation Committee, Peterborough.

**Church, J.M., Coppins, B.J., Gilbert, O.L., James, P.W. & Stewart, N.F. (1996)**. *Red Data Book for Lichens*. Joint Nature Conservation Committee, Peterborough.

**Church, J.M., Coppins, B.J., Gilbert, O.L., James, P.W. and Stewart, N.F. (1996).** *Red Data Books of Britain and Ireland: Lichens, Vol. 1: Britain*. Joint Nature Conservation Committee, Peterborough.

**Church, J.M., Hodgetts, N.G., Preston, C.D. & Stewart, N.F. (2001).** *Red Data Book for Mosses and Liverworts*. . Joint Nature Conservation Committee, Peterborough.

**Clements, D.K. & Pryce, R.D. (1999).** *Criteria for the Selection of Wildlife Sites in Gwent Glamorgan and Carmarthenshire.* 1st Working Version.

**Clements, D.K. & Tofts (1992).** *Hedgerow Evaluation and Grading System (HEGS): a methodology for the ecological survey, evaluation and grading of hedgerows* (Test Draft). Countryside Planning and Management, Cirencester.

**Collis, I. & Tyldesley, D. (1993).** *Natural Assets - Non-statutory Sites of Importance for Nature Conservation*. The Local Government Nature Conservation Initiative.

**Corbet, P. and Brooks, S. (2008)** *Dragonflies.* Harper Collins

**Dandy, J.E. (1969).** *Watsonian Vice-Counties of Great Britain*. British Systematic Association Special Volume.

**Department of the Environment, Transport & the Regions - Local Sites Review Group (DETR - LSRG, 2000)** *A Report to DETR* (March 2000). DETR, London.

**Duigan C.A., Kovach, W.L., Palmer, M. (2006)** *Vegetation communities of British lakes: a revised classification.* http://www.jncc.gov.uk/default.aspx?page=3703

**EC Habitats Directive (1992)** Annex G: Council Directive 92/43/EEC, ODPM.

**Ellis, R.G. (1983).** *Flowering Plants of Wales.* National Museum of Wales, Cardiff.

**Environment Agency (1996).** *River Habitat Survey: Field survey guidance manual*. Environment Agency.

**Evans, T. (2003).** *Rare Plant Register VC35 (Mons).* Privately published.

**Evans, S., Henrici, A. and Ing, B. (2007)** *British Fungi Red Data List*. British Mycological Society.

**Fay, N. & de Berker, N. (1998).** *Veteran Trees: An introduction to surveying ancient trees*. English Nature Publication.

**Foster, J. & Gent, A. (Eds) (1996).** *Reptile survey methods:* proceedings of a seminar held on 7 November 1995 at the Zoological Society of London's Meeting Rooms, Regent's Park, London. English Nature Science Report **27**.

**Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993).** *The New Atlas of Breeding Birds in Britain and Ireland 1988-1991*. British Trust for Ornithology *et al*. T & A.D. Poyser.

**Gilbert, O. (2000)** *Lichens.* Collins

**Glamorgan Moth Recording Group (2003).** *Moth Species Records for Glamorgan (VC41).*

**Grayson, R.F. (1994).** Surveying and monitoring great crested newts ***In:*** Gent, A. & Bray, R. (Eds) Conservation and management of great crested newts: Proceedings of a symposium held on 11 January 1994 at Kew Gardens, Richmond, Surrey. *English Nature Science Report* **20**.

**Greater Gwent Biodiversity Action Group (GGBAG 2000).** *Biodiversity Guidance for Gwent 2001-2005*. GGBAG, Cwmbran.

**Green, J. (2000).** *Birds in Wales 1992-2000*. Welsh Ornithological Society.

**Gregory R.D., Wilkinson, N.I., Noble, D.G., Robinson, J.A., Brown, A.F., Hughes, J., Procter, D., Gibbons, D.W. and Galbraith, C. (2002).** The population status of birds in the United Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002–2007. *British Birds* **95**: 410–448.

**Grice, P. (1994).** England's freshwater fish in context. English Nature; *Species Conservation Handbook*. English Nature, Peterborough.

**Harding, P.T. & Rose, F. (1986).** *Pasture-woodlands in lowland Britain*. Institute of Terrestrial Ecology.

**Harris, S. and Yalden, D.W. (2008)** *Mammals of the British Isles: Handbook 4th Edition.* Mammal Society, London.

**Hawkswell, S. (Ed.) (1997).** *The Wildlife Sites Handbook* (Version 2). The Wildlife Trusts, Lincoln.

**Hodgetts *et al.* (1996).** *The Pink Book of Plants*. Joint Nature Conservation Committee, Peterborough.

**Hopkins, J.J. (1996).** Scrub ecology and conservation. *British Wildlife* **8**(1): 28-36.

**Horton, G.A.N. (1994).** *Monmouthshire Lepidoptera: the butterflies and moths of Gwent*. Comma International Biological Systems.

**Hornby, R. & Rose, F. (1986).** *The use of vascular plants in evaluation of ancient woodland for nature conservation in Southern England*, Unpublished NCC report.

**HMSO (1981).** *Wildlife and Countryside Act 1981* (c69). HMSO, London.

**HMSO (1990).** *Environmental Protection Act* (c43). HMSO, London.

**HMSO (1992).** *Protection of Badgers Act 1992* (c51*)*. HMSO, London.

**HMSO (1992).** *The Habitats Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*. HMSO, London.

**HMSO (1994).** *The Conservation (Natural Habitats, &c.) Regulations*. HMSO, London.

**HMSO (1997).** *Hedgerow Regulations***.** Statutory Instrument 1997 no.1160, HMSO, London.

**Hill MO, Preston CD, Smith AJE. (1991).** *Atlas of the bryophytes of Britain and Ireland. Volume 1. Liverworts (Hepaticae and Anthocerotae).* Colchester: Harley Books.

**Hill MO, Preston CD, Smith AJE. (1992).** *Atlas of the bryophytes of Britain and Ireland. Volume 2. Mosses (except Diplolepidae).* Colchester: Harley Books.

**Hill MO, Preston CD, Smith AJE. (1994).** *Atlas of the bryophytes of Britain and Ireland. Volume 3. Mosses (Diplolepidae).* Colchester: Harley Books.

**Howe, M.A. (2002).** *A provisional checklist of the invertebrates recorded in Wales 3. Brachyceran flies* (*Diptera: Xylophagidae to Dolichopodidae*) Countryside Council for Wales

**Ing, B. (1993).** Towards a Red List of Endangered European Macrofungi. In: Peglar *et al.* (Eds.) *Fungi of Europe: Investigation, Recording and Conservation* pp. 231 - 237, Royal Botanic Gardens, Kew.

**Inns, H. (1996).** *Survey methodology for British reptiles: a practical proposition?* (Appendix: Survey guidelines for the widespread British reptiles) ***In:*** Foster & Gent (Eds) (1996) [see above].

**International Union for the Conservation of Nature, (2001).** *IUCN Red List Categories and Criteria: Version 3.1*. IUCN, Gland, Switzerland and Cambridge, UK.

**Jones, A. (2006).** *IUCN Listing of Welsh Vascular Plants*. BSBI Welsh Bull. **77**: 5

**Jones P.S., Stevens D.P., Blackstock T.H., Burrows C.R. and Howe E.A. (2003).** *Priority Habitats of Wales: A Technical Guide*. Bangor, CCW.

**Joy, J. & Bourn, N. (Eds.) (1998).** *National Action Plan for Wales*. Butterfly Conservation.

**Kay, Q.O.N. (1999).** List of scarce and rare plants in Glamorgan (West). University of Swansea (unpublished report).

**Kerney, M. & Stubbs, A.E. (1980).** *The conservation of snails, slugs and freshwater mussels*. Nature Conservancy Council, Peterborough.

**Kirby, K.J., Peterken, G.F., Spencer, J.W. & Walker, G.J. (1984).** Inventories of ancient semi-natural woodland. *Focus on Nature Conservation* **6**. Nature Conservancy Council, Peterborough.

**Lister, J. & Whitbread, A. (1988).** *Carmarthenshire Inventory of Ancient Woodlands* (Provisional). Nature Conservancy Council, Peterborough.

**Lucas, A. (1997).** *Mammals in Carmarthenshire*. Andrew Lucas Publications, Llandysul.

**Marren, P. (1990).** *Britain's Ancient Woodland: Woodland Heritage.* Nature Conservancy Council, Peterborough.

**Maitland, P.S. & Campbell, R.N. (1992).** *Freshwater Fish*. Collins New Naturalist Series.

**Maitland Emmet, A. & Heath, J. (Eds.) (1989).** *The Moths and Butterflies of Great Britain and Ireland.* Harley Books, Colchester.

**Marshall, J.A. & Haes, E.C.M. (1988).** *Grasshoppers and Allied Insects of Great Britain and Ireland.* Harley Books.

**Nature Conservancy Council (1989).** *Guidelines for the Selection of Biological SSSIs.* NCC, Peterborough.

**Nature Conservancy Council (1990).** *Handbook for Phase 1 Habitat Survey: a Technique for Environmental Audit.* NCC, Peterborough.

**Nature Conservancy Council (1987).** *Red Data Book; 2, Insects*. NCC, Peterborough.

**Nicolet, P., Weatherby, A., Biggs, J., Williams, P., and Hatton-Ellis, T. (2007)** *A preliminary assessment of important ponds areas (IPAs) in Wales* Pond Conservation/ Countryside Council for Wales.

**Gilbert, O. (2000).** *Lichens.* Collins.

**Palmer, MA & Roy, DB (2001)** *An estimate of the extent of dystrophic, oligotrophic, mesotrophic and eutrophic standing fresh water in Great Britain.* JNCC Report, No. 317

**Peterken, G. (2000).** Identifying ancient woodland using vascular plant indicators. *British Wildlife* **11**: 153-158.

**Pickles, W. (1942).** Mound Building by the ant *Lasius flavus. Ent. Mon. Magazine* **78:**38-39.

**Pond Action (1998).** *A Guide to the Methods of the National Pond Survey.* Pond Action, Oxford.

**Porley, R. and Hodgetts, N. (2005)**. *Mosses and Liverworts*. Collins.

**Preston, C.D., Pearman, D.A. & Dines, T.D. (2002).** *New Atlas of the British and Irish Flora.* Oxford University Press

**Preston, C.D. (2006).** A revised list of nationally scarce bryophytes. Field Bryology **90**: 22-30.

**Pryce, R.D. (1999).** *Carmarthenshire Rare Plants Register* (unpublished report).

**Rackham, O. (2003)** *Ancient Woodland Its History, Vegetation and Use in England.* Castlepoint Press

**Rald, E. (1985)** *Vokshatte som indikatorarter for mykologisk vaerdifulde overdrevslokaliteter* Svampe **11** : 1-9

**Ratcliffe, D. (1968).** *An ecological account of Atlantic bryophytes in the British Isles.* New Phytologist **67**: 365- 439.

**Ratcliffe, D. (1977).** *A Nature Conservation Review*. Cambridge University Press.

**Rodwell, J.S. (Ed.) (1991).** *British Plant Communities*. 1. Woodlands and Scrub. Cambridge University Press.

**Rodwell, J.S. (Ed.) (1991).** *British Plant Communities*. 2. Mires and Heaths. Cambridge University Press.

**Rodwell, J.S. (Ed.) (1992).** *British Plant Communities*. 3. Grasslands and Montane Communities. Cambridge University Press.

**Rodwell, J.S. (Ed.) (1995).** *British Plant Communities*. 4. Aquatic Communities, Swamps and Tall-Herb Fens. Cambridge University Press.

**Rodwell, J.S. (Ed.) (2000).** *British Plant Communities*. 5. Maritime Communities and Vegetation of Open Habitats. Cambridge University Press.

**Rose, F. (1993).** Ancient woodlands and their epiphytes. *British Wildlife* **5**: 83-93.

**Rose, F. (1999).** Indicators of ancient woodland. *British Wildlife* **10**; 241-251.

**Rotherie, M. (1999)** *Mycological survey of selected semi-natural grasslands in Carmarthenshire.* Countryside Council for Wales.

**Seaward, M.R.D. (Ed.) (1995-99).** *Lichen Atlas of the British Isles*. Issues in fascicles by the British Lichen Society, Natural History Museum, London.

**Sothern, E. (1986).** *Glamorgan Inventory of Ancient Woodlands* (Provisional). Nature Conservancy Council, Peterborough.

**Spooner, B. and Roberts, P. (2005)** *Fungi*. Collins

**Stace, C. (1997).** *New Flora of the British Isles, 2nd Ed*. Cambridge University Press.

**Straatsma G, Ayer f, and Egli s. (2001).** *Species richness, abundance, and phenology of fungal fruit bodies over 21 years in a Swiss forest plot.* Mycological Research **105:** 515-523.

**Stewart, A., Pearman, D.A. & Preston, C.D. (1994).** *Scarce Plants in Britain*. Institute of Terrestrial Ecology, Huntingdon.

**Stewart, N.F. & Church, J.M. (1993)** *Red Data Books of Britain and Ireland: Stoneworts* Joint Nature Conservation Committee

**Stringer, R.N. & Davies, R.H. (1989).** *A botanical survey of Carmel Woods, Dyfed, Wales*. Nature Conservancy Council, Llanelli (unpublished report).

**Stubbs, A.E. (1987).** *Ancient woodland indicators*. **In:** D. Whiteley (ed.) Hoverflies of the Sheffield area and North Derbyshire. *Sorby Record Special Series* **6**: 47-49.

**Thorpe, R.I. & Young, A. (2003).** *"The population status of birds in Wales: an analysis of conservation concern, 2002-2007*". RSPB Cymru, Cardiff.

**Thorpe, R.I. (2000).** Bird Populations in Wales 1994-1999. A monitoring review – scarce breeding species. *Welsh Birds* 2 (6) 360-376.

**Trueman, I., Morton, A. & Wainwright, M.** (1995) *The Flora of Montgomeryshire*. The Montgomeryshire Field Society and The Montgomeryshire Wildlife Trust.

**Tucker, G.M. & Heath, M.F. (1994).** *Birds in Europe: Their Conservation Status*. Birdlife International.

**Tyler, S., Lewis, J., Venables, A. & Walton, J. (1987).** *The Gwent Atlas of Breeding Birds*. Gwent Ornthithological Society.

**UK Biodiversity Group (1995).** *Biodiversity: The UK Steering Group Report* (2 vols). HMSO, London.

**UK Biodiversity Action Group (1999).** *UK Biodiversity Group. Tranche 2 Action Plans. Volume IV. Invertebrates*. English Nature, Peterborough.

**Wade, A.E. (1970).** *The Flora of Monmouthshire*. National Museum of Wales.

**Wade, A.E., Kay, Q.O.N. & Ellis, R.G. (1994).** *Flora of Glamorgan*. National Museum of Wales, Cardiff.

**Walker, G.J. & Buckley, K. (1989).** *Gwent Inventory of Ancient Woodlands* (Provisional). Nature Conservancy Council.

**Ward, S.D. (Ed.) (1999).** *Local Biodiversity Action Plans - Technical Information on Species: 1 Cryptogamic Plants and Fungi*. Scottish Natural Heritage Review No 70, Scottish Natural Heritage.

**Welsh Assembly Government (2002).** *Planning Policy WALES.* Welsh Assembly Government, Cardiff.

**Welsh Assembly Government (2003).** *Going Wild in Wales; List of Species & Habitats of Principle Importance for the Conservation of Biological diversity*.

**Welsh Assembly Government (2006***). Nature Conservation and Planning; Technical Advice Note (Wales) 5*. Consultation Draft.

**Welsh Assembly Government (2008).** List of Species and Habitats of Principal Importance for Conservation of Biological Diversity in Wales

**Welsh Office (1996).** *Nature Conservation and Planning; Technical Advice Note (Wales) 5.*

**Westwood, S., Kerry, S., Lindley, C. & Hurford C. (1995).** A habitat survey of the county of Gwent. Countryside Council for Wales (unpublished report).

**Whitehead, P.F. (1992).** Fruit trees, orchards and their rare invertebrates. *Entomologist's Gazette* **43**: 303-304.

**Williams, P.J., Biggs, J., Barr, C.J., Cummins, C.P., Gillespie, M.K., Rich, T.C.G., Baker, A., Baker, J., Beesley, J., Corfield, A., Dobson, D., Culling, A.S., Fox, G., Howard, D.C., Luursema, K., Rich, M.D.B., Samson, D., Scott, W.A., White, R. & Whitfield, M. (1998).** *Lowland Ponds Survey 1996*. DETR, London.

**Woods, R.G. (1993).** *Flora of Radnorshire*. National Museum of Wales, Cardiff.

**Woods, R.G. and Orange, A., (1999).** *A Census Catalogue of Welsh Lichens*. National Museums and Galleries of Wales, Cardiff.

# APPENDIX 1
# VASCULAR PLANT AND BRYOPHYTE SPECIES INDICATOR LISTS

Vascular Plant and Bryophyte Species indication lists for South Wales and Powys from The Guidelines for the Selection of Wildlife Sites in South Wales was compiled by Gemma Bodé, Wildlife Sites Officer, Gwent Wildlife Trust, and the Powys Wildlife Sites Guidelines (1999).

**Table 1 Native Woodland Vascular Plants in South Wales.**

| Scientific Name | Common Name |
|---|---|
| *Acer campestre* | field maple |
| *Adoxa moschatellina* | moshatel |
| *Allium ursinum* | ramsons |
| *Anemone nemorosa* | wood anenome |
| *Aquilega vulgaris* | columbine |
| *Blechnum spicant* | hard fern |
| *Bromus ramosus* | hairy brome |
| *Calluna vulgaris* | heather |
| *Campanula trachelium* | nettle-leaved bellflower |
| *Carex laevigata* | smooth-stalked sedge |
| *Carex pallescens* | pale sedge |
| *Carex pendula* | pendulous sedge |
| *Carex remota* | distant sedge |
| *Carex strigosa* | thin-spiked wood-sedge |
| *Carex sylvatica* | wood sedge |
| *Chrysosplenium alternifolium* | alternate-leaved golden-saxifrage |
| *Chrysosplenium oppositifolium* | opposite-leaved golden-saxifrage |
| *Conopodium majus* | pignut |
| *Convallaria majalis* | lily-of-the-valley |
| *Corydalis claviculata* | climbing corydalis |
| *Daphne laureola* | spurge laurel |
| *Daphne mezereon* | mezeron |
| *Deshampsia flexuosa* | wavy hair grass |
| *Dryopteris affinis* | scaly male fern |
| *Dryopteris aemula* | hay-scented buckler fern |
| *Elymus caninus* | bearded couch-grass |
| *Epipactis helleborine* | broad-leaved helleborine |
| *Equisetum sylvaticum* | wood horsetail |
| *Euonymus europaeus* | spindle |
| *Euphorbia amygdaloides* | wood spurge |
| *Festuca gigantea* | giant fescue |
| *Frangula alnus* | alder buckthorn |
| *Galium odoratum* | sweet woodruff |
| *Geum rivale* | water avens |
| *Gymnocarpium dryopteris* | oak fern |
| *Hyacinthoides non-scripta* | bluebell |
| *Hymenophyllum tunbridgense* | Tunbridge filmy-fern |
| *Hymenophyllum wilsonii* | Wilson's filmy fern |
| *Hypericum androsaemum* | tutsan |
| *Iris foetidissima* | stinking iris |
| *Lamiastrum galeobdolon* | yellow archangel |
| *Lathraea squamaria* | toothwort |

| Scientific Name | Common Name |
|---|---|
| *Luzula forsteri* | southern woodrush |
| *Luzula pilosa* | hairy woodrush |
| *Luzula sylvatica* | great woodrush |
| *Lysimachia nemorum* | yellow pimpernel |
| *Malus sylvestris* | crab apple |
| *Melampyrum pratense* | common cow-wheat |
| *Melica uniflora* | wood mellick |
| *Melittis melissophyllum* | bastard balm |
| *Mercurialis perennis* | dog's mercury |
| *Milium effusum* | wood millet |
| *Moehringia trinervum* | three-nerved sandwort |
| *Neottia nidus-avis* | bird's nest orchid |
| *Orchis mascula* | early purple-orchid |
| *Oxalis acetosella* | wood sorrel |
| *Paris quadrifolia* | herb-Paris |
| *Platanthera chlorantha* | greater butterfly orchid |
| *Poa nemoralis* | wood meadow grass |
| *Polygonatum multiflorum* | solomon's seal |
| *Polystichum aculeatum* | hard shield fern |
| *Polystichum setiferum* | soft shield fern |
| *Populus tremula* | aspen |
| *Potentilla sterilis* | barren strawberry |
| *Primula vulgaris* | primrose |
| *Prunus padus* | bird cherry |
| *Quercus petraea* | sessile oak |
| *Ranunculus auricomus* | goldilocks buttercup |
| *Rhamnus catharticus* | buckthorn |
| *Ribes rubrum* | redcurrant |
| *Sanicula europaea* | sanicle |
| *Scirpus sylvaticus* | wood club-rush |
| *Scrophularia nodosa* | figwort |
| *Sorbus torminalis* | wild service |
| *Stellaria neglecta* | greater chickweed |
| *Stellaria nemorum* | wood stichwort |
| *Taxus baccata* | yew |
| *Tilia cordata* | small-leaved lime |
| *Ulmus glabra* | wych elm |
| *Vaccinium myrtillus* | bilberry |
| *Veronica montana* | wood speedwell |
| *Viburnum opulus* | guelder rose |
| *Vicia sylvatica* | wood vetch |
| *Viola reichenbachiana* | pale dog violet |

| Table 1(a) Ancient Woodland Indicators with restricted distribution in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Campanula trachelium* | Nettle-leaved Bellflower** | X | X | X |
| *Carex strigosa* | Thin-spiked Wood-sedge** | X | X | X |
| *Chrysosplenium alternifolium* | Alternate-leaved golden saxifrage* | X | X | X |
| *Euonymus europaeus* | Spindle* | X | X | X |
| *Euphorbia amygdaloides* | Wood Spurge** | X | X | X |
| *Hypericum androsaemum* | Tutsan* | X | X | X |
| *Hypericum hirsutum* | Hairy St. John's wort* | X | X | X |
| *Lathraea squamaria* | Toothwort* | X | X | X |
| *Luzula forsteri* | Southern Wood-rush** | X | X | - |
| *Milium effusum* | Wood millet* | X | X | X |
| *Narcissus pseudonarcissus* | Wild Daffodil* | X | X | - |
| *Neottia nidus-avis* | Bird's-nest Orchid* | X | X | X |
| *Paris quadrifolia* | Herb Paris* | X | X | X |
| *Ranunculus auricomus* | Goldilocks Buttercup* | X | X | X |
| *Sorbus torminalis* | Wild service tree* | X | X | X |
| *Stellaria nemorum* | Wood Stitchwort** | X | X | - |
| *Viola reichenbachiana* | Early Dog-Violet* | X | X | X |

* 4 – 25 known sites in Powys
** < 3 known sites in Powys

Information supplied by Mr. M. Porter, Brecknock botanical recorder.

| Table 1 (b) Other Ancient Woodland Indicators species found in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Acer campestre* | field maple | X | X | X |
| *Adoxa moschatellina* | moschatel | X | X | X |
| *Allium ursinum* | ramsons | X | X | X |
| *Anemone nemorosa* | wood anemone | X | X | X |
| *Aquilegia vulgaris* | columbine | X | X | X |
| *Bromus ramosus* | hairy brome | X | X | X |
| *Campanula latifolia* | large campanula | X | X | X |
| *Carex laevigata* | smooth sedge | X | X | X |
| *Carex pendula* | pendulous sedge | X | X | X |
| *Carex remota* | remote sedge | X | X | X |
| *Circaea lutetiana* | enchanter's nightshade | X | X | X |
| *Conopodium majus* | pignut | X | X | X |
| *Convallaria majalis* | lily-of-the-valley | X | X | X |
| *Dryopteris affinis* | scaly male fern | X | X | X |
| *Epipactis helleborine* | broad-leaved helleborine | X | X | X |
| *Equisetum sylvaticum* | wood horsetail | X | X | X |
| *Festuca altissima* | wood fescue | X | X | X |
| *Festuca gigantea* | tall brome | X | X | X |
| *Frangula alnus* | alder buckthorn | X | X | X |
| *Galium odoratum* | sweet woodruff | X | X | X |
| *Geum rivale* | water avens | X | X | X |
| *Helleborus viridis* | green hellebore | X | X | X |
| *Holcus mollis* | creeping soft-grass | X | X | X |
| *Hyacinthoides non-scripta* | bluebell | X | X | X |
| *Ilex aquifolium* | holly | X | X | X |
| *Lamiastrum galeobdolon* | yellow archangel | X | X | X |
| *Lathyrus montanus* | bitter vetch | X | X | X |
| *Lathyrus sylvestris* | narrow-leaved everlasting pea | X | X | X |
| *Luzula pilosa* | hairy wood-rush | X | X | X |
| *Luzula sylvatica* | great wood-rush | X | X | X |
| *Lysimachia nemorum* | yellow pimpernel | X | X | X |
| *Malus sylvestris* | crab apple | X | X | X |
| *Melampyrum pratense* | cow wheat | X | X | X |
| *Melica nutans* | mountain melick | X | X | X |
| *Melica uniflora* | wood melick | X | X | X |
| *Mercurialis perennis* | dog's mercury | X | X | X |
| *Moehringia trinervia* | three-veined sandwort | X | X | X |
| *Myosotis sylvatica* | wood forget-me-not | X | X | X |
| *Orchis mascula* | early-purple orchid | X | X | X |
| *Oxalis acetosella* | wood sorrel | X | X | X |
| *Phyllitis scolopendrium* | hart's-tongue fern | X | X | X |
| *Poa nemoralis* | wood poa | X | X | X |
| *Polygonatum multiflorum* | solomon's-seal | X | X | X |
| *Polygonatum odoratum* | angular solomon's-seal | X | - | - |
| *Polypodium vulgare* | polypody | X | X | X |
| *Polystichum lobatum* | hard shield fern | X | X | X |
| *Polystichum setiferum* | soft shield fern | X | X | X |
| *Populus tremula* | aspen | X | X | X |
| *Primula vulgaris* | primrose | X | X | X |

| Table 1 © Other Ancient Woodland Indicators species found in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Prunus avium* | wild cherry | X | X | X |
| *Prunus padus* | bird cherry | X | X | X |
| *Quercus petraea* | sessile oak | X | X | X |
| *Ribes nigrum* | black currant | X | X | X |
| *Ribes sylvestre* | red currant | X | X | X |
| *Rosa arvensis* | field rose | X | X | X |
| *Sanicula europaea* | sanicle | X | X | X |
| *Scrophularia nodosa* | figwort | X | X | X |
| *Solidago vigaurea* | golden-rod | X | X | X |
| *Stellaria holostea* | greater stitchwort | X | X | X |
| *Tamus communis* | black bryony | X | X | X |
| *Taxus baccata* | yew | X | X | X |
| *Tilia cordata* | small-leaved lime | X | X | X |
| *Ulmus glabra* | wych elm | X | X | X |
| *Veronica montana* | wood speedwell | X | X | X |
| *Viburnum opulus* | guelder rose | X | X | X |
| *Vicia sepium* | bush vetch | X | X | X |
| *Vicia sylvatica* | wood vetch | X | - | - |

R.G. Ellis (1983); G.F. Peterken (1974); R. Hornby and F. Rose (1986); and comments from the Brecknock Botanical Recorder.

| Table 1 (d) 3 Other Vascular Species found in Native Ancient Woodland in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Aconitum napellus* | monk's-hood | X | X | X |
| *Agropyron caninus* | bearded couch-grass | X | X | X |
| *Agrostis canina* | brown bent | X | X | X |
| *Agrostis capillaris* | common bent | X | X | X |
| *Agrostis gigantea* | black bent | X | X | X |
| *Agrostis stolonifera* | creeping bent | X | X | X |
| *Ajuga reptans* | bugle | X | X | X |
| *Alliara petiolata* | garlic-mustard | X | X | X |
| *Alnus glutinosa* | alder | X | X | X |
| *Angelica sylvestris* | wild angelica | X | X | X |
| *Anthoxanthum odoratum* | sweet vernal-grass | X | X | X |
| *Anthriscus sylvestris* | cow parsley | X | X | X |
| *Arctium minus* | burdock | X | X | X |
| *Arrhenatherum elatius* | oat-grass | X | X | X |
| *Arum maculatum* | lords-and-ladies | X | X | X |
| *Asplenium trichomanes* | maidenhair spleenwort | X | X | X |
| *Asplenium viride* | green spleenwort | X | X | - |
| *Athyrium filix-femina* | lady-fern | X | X | X |
| *Betonica officinalis* | betony | X | X | X |
| *Betula pendula* | silver birch | X | X | X |
| *Betula pubescens* | downy birch | X | X | X |
| *Blechnum spicans* | hard-fern | X | X | X |
| *Brachypodium sylvaticum* | slender false-brome | X | X | X |
| *Bryonia dioica* | white bryony | X | X | X |
| *Calluna vulgaris* | ling | X | X | X |
| *Caltha palustris* | marsh marigold | X | X | X |
| *Calystegia sepium* | hedge bindweed | X | X | X |
| ***Campanula patula*** [n] | spreading bellflower | X | X | X |
| *Cardamine flexuosa* | wavy bitter cress | X | X | X |
| *Cardamine impatiens* | narrow leaved bitter cress | X | X | X |
| *Cardamine pratensis* | cuckoo flower | X | X | X |
| *Carduus acanthoides* | welted thistle | X | X | X |
| *Carex acutiformis* | lesser pond sedge | X | X | X |
| *Carex binervis* | ribbed sedge | X | X | X |
| *Carex hirta* | hairy sedge | X | X | X |
| *Carex pallescens* | pale sedge | X | X | X |
| *Carex paniculata* | panicled Sedge | X | X | X |
| *Chaemanerion angustifolium* | rosebay willowherb | X | X | X |
| *Cirsium palustre* | marsh thistle | X | X | X |
| *Colchicum autumnale* | autumn crocus | X | X | X |
| *Corydalis claviculata* | white climbing fumitory | X | X | X |
| *Cornus sanguinea* | dogwood | X | X | X |
| *Coryllus avellana* | hazel | X | X | X |
| *Crataegus monogyna* | hawthorn | X | X | X |
| *Crepis paludosa* | marsh hawk's-beard | X | X | X |
| *Dactylorhiza fuchsii* | common-spotted orchid | X | X | X |
| *Dactylis glomerata* | cocksfoot | X | X | X |
| *Deschampsia cespitosa* | tufted hair-grass | X | X | X |
| *Deschampsia flexuosa* | wavy hair-grass | X | X | X |
| *Digitalis purpurea* | foxglove | X | X | X |

| Table 1 (d) Other Vascular Species found in Native Ancient Woodland in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Dryopteris austriaca* | broad buckler-fern | X | X | X |
| *Dryopteris filix-mas* | male-fern | X | X | X |
| *Epilobium hirsutum* | great hairy willow-herb | X | X | X |
| *Epilobium montanum* | broad-leaved willow-herb | X | X | X |
| *Epilobium obscurum* | dull-leaved willow-herb | X | X | X |
| *Epilobium roseum* | small-flowered willow-herb | X | X | X |
| *Eupatorium cannabinium* | hemp agrimony | X | X | X |
| *Fagus sylvatica* | beech | X | X | X |
| *Festuca ovina* | sheep's fescue | X | X | X |
| *Festuca rubra* | red fescue | X | X | X |
| *Filipendula ulmaria* | meadowsweet | X | X | X |
| *Fragaria vesca* | wild strawberry | X | X | X |
| *Fraxinus excelsior* | ash | X | X | X |
| *Frangula alnus* | alder buckthorn | X | X | X |
| *Galium aparine* | cleavers | X | X | X |
| *Galium odoratum* | sweet woodruff | X | X | X |
| *Galium palustre* | marsh bedstraw | X | X | X |
| *Galium saxatile* | heath bedstraw | X | X | X |
| *Geranium lucidum* | Shining cranesbill | X | X | X |
| *Geranium robertarium* | herb-robert | X | X | X |
| *Geum urbanum* | wood avens | X | X | X |
| *Glechoma hederacea* | ground ivy | X | X | X |
| *Hedera helix* | ivy | X | X | X |
| *heracleum sphondylium* | hogweed | X | X | X |
| *Hieracium sp.* | hawkweed ssp. | X | X | X |
| *Holcus lanatus* | Yorkshire fog | X | X | X |
| *Hypericum humifusum* | trailing St. John's-wort | X | X | X |
| *Hypericum maculatum* | imperforate St. John's-wort | X | X | X |
| *Hypericum perforatum* | perforated St. John's-wort | X | X | X |
| *Hypericum tetrapterum* | square-stalked St. John's-wort | X | X | X |
| *Iris pseudacorus* | yellow flag | X | X | X |
| *Juncus acutiflorus* | sharp-flowered rush | X | X | X |
| *Juncus conglomeratus* | conglomerate rush | X | X | X |
| *Juncus effusus* | soft rush | X | X | X |
| *Lapsana communis* | nipplewort | X | X | X |
| *Ligustrum vulgare* | privet | X | X | X |
| *Listera ovata* | common twayblade | X | X | X |
| *Lonicera periclymenum* | Honeysuckle | X | X | X |
| *Luzula campestris* | Field Wood-rush | X | X | X |
| *Luzula multiflora* | Heath Wood-rush | X | X | X |
| *Lychnis flos-cuculi* | Ragged Robin | X | X | X |
| *Lysimachia vulgaris* | Yellow Loosestrife | X | X | X |
| *Lythrum salicaria* | Purple Loosestrife | X | X | X |
| *Mentha aquatica* | Water Mint | X | X | X |
| *Mentha arvensis* | Corn Mint | X | X | X |
| *Molinia caerulea* | Purple Moor-grass | X | X | X |
| *Montia sibirica* | Pink Purslane | X | X | X |
| *Mycelis muralis* | Wall Lettuce | X | X | X |
| *Myosotis arvensis* | Common Forget-me-not | X | X | X |
| *Potentilla sterilis* | Barren Strawberry | X | X | X |

| Table 1 (d) Other Vascular Species found in Native Ancient Woodland in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Prunus spinosa* | Blackthorn | X | X | X |
| *Pteridium aquilinum* | Bracken | X | X | X |
| *Quercus robur* | pedunculate oak | X | X | X |
| *Rhamnus catharticus* | Buckthorn | X | X | X |
| *Ribes uva-crispa* | gooseberry | X | X | X |
| *Rubus fruticosus agg.* | bramble | X | X | X |
| *Rubus idaeus* | raspberry | X | X | X |
| *Rumex sanguineus* | wood dock | X | X | X |
| *Salix caprea* | goat willow | X | X | X |
| *Salix cinerea agg.* | grey willow | X | X | X |
| *Sambucus nigra* | elder | X | X | X |
| *Silene dioica* | red campion | X | X | X |
| *Sorbus aucuparia* | rowan | X | X | X |
| *Stachys palustris* | marsh woundwort | X | X | X |
| *Stachys sylvatica* | hedge woundwort | X | X | X |
| *Stellaria alsine* | bog stitchwort | X | X | X |
| *Stellaria graminea* | lesser stitchwort | X | X | X |
| *Stellaria media* | common chickweed | X | X | X |
| *Stellaria neglecta* | greater chickweed | X | X | X |
| *Succisa pratensis* | devil's-bit scabious | X | X | X |
| *Teucrium scorodonium* | wood sage | X | X | X |
| *Thelypteris oreopteris* | lemon-scented fern | X | X | X |
| *Tilia platyphyllos* | large-leaved lime | X | - | X |
| *Torilis japonica* | upright hedge-parsley | X | X | X |
| *Ulex europaeus* | gorse | X | X | X |
| *Ulmus minor* | smooth elm | X | - | X |
| *Ulmus procera* | English elm | X | X | X |
| *Urtica dioica* | stinging nettle | X | X | X |
| *Vaccinium myrtillus* | bilberry | X | X | X |
| *Valeriana dioica* | marsh valerian | X | X | X |
| *Valeriana officinalis* | valerian | X | X | X |
| *Veronica chamedrys* | germander speedwell | X | X | X |
| *Veronica hederifolia* | ivy-leaved speedwell | X | X | X |
| *Veronica officinalis* | common speedwell | X | X | X |
| *Vinca minor* | lesser periwinkle | X | X | X |
| *Viola odorata* | sweet violet | X | X | X |
| *Viola palustris* | marsh violet | X | X | X |
| *Viola riviniana* | common dog-violet | X | X | X |
| *Wahlenbergia hederacea* | ivy campanula | X | X | X |

**Table 2 Indicator species for Arable Field Margins in South Wales.**

***Indicator species for arable field margins***

| Scientific Name | Common Name |
|---|---|
| *Agrostemma githago* | corncockle |
| *Anagallis arvensis subsp. foemina* | blue pimpernel |
| *Anchusa arvensis* | bugloss |
| *Anisantha diandra* | great brome |
| *Anthemis arvensis* | corn chamomile |
| *Anthemis cotula* | stinking chamomile |
| *Anthriscus caucalis* | bur chervil |
| *Brassica nigra* | black mustard |
| *Bromus secalinus* | rye-brome |
| *Centaurea cyanus* | cornflower |
| *Chenopodium album* | fat-hen |
| *Chenopodium ficifolium* | fig-leaved goosefoot |
| *Chenopodium murale* | nettle-leaved goosefoot |
| *Chrysanthemum segetum* | corn marigold |
| *Coronopus squamatus* | swine-cress |
| *Descurania sophia* | flixweed |
| *Erysimum cheiranthoides* | treacle mustard |
| *Euphorbia exigua* | dwarf spurge |
| *Euphorbia helioscopa* | sun spurge |
| *Euphorbia platyphyllos* | broad-leaved spurge |
| *Fallopia convolvulus* | black bindweed |
| *Fillago vulgaris* | common cudweed |
| *Fumaria purpurea* | purple ramping-fumitory |
| *Fumaria bastardii* | tall ramping-fumitory |
| *Fumaria muralis* | common ramping-fumitory |
| *Fumaria officinalis* | common fumitory |
| *Galeopsis angustifolia* | red hemp-nettle |
| *Galium tricornutum* | corn cleavers |
| *Gastridium ventricosum* | nit-grass |
| *Hypochaeris glabra* | smooth cats-ear |
| *Kickxia elatine* | sharp-leaved fluellen |
| *Kickxia spuria* | round-leaved fluellen |
| *Lamium amplexicaule* | henbit dead-nettle |
| *Lamium hybridum* | cut-leaved dead-nettle |
| *Lepidium campestre* | field pepperwort |
| *Lithospermum arvense* | field gromwell |
| *Lythrum hyssopifolium* | grass-poly |
| *Misopates orontium* | weasel snout |
| *Papaver argemone* | prickly poppy |
| *Papaver dubium (both ssp's)* | long-headed poppy |
| *Papaver hybridium* | rough poppy |
| *Papaver rheos* | common poppy |
| *Petroselinum segetum* | corn parsley |
| *Polygonum rurivagum* | cornfield knotgrass |
| *Ranunculus arvensis* | corn buttercup |
| *Ranunculus parviflorus* | small-flowered buttercup |
| *Ranunculus sardous* | hairy buttercup |
| *Reseda lutea* | wild mignonette |
| ***Scandix pecten-veneris*** | shepherd's-needle |
| *Sheradia arvensis* | field madder |

| | | |
|---|---|---|
| | ***Silene gallica*** | small flowered catchfly |
| | *Silene noctiflora* | night-flowering catchfly |
| | *Spergula arvensis* | corn spurrey |
| | *Stachys arvensis* | field woundwort |
| | *Thlaspi arvense* | field penny-cress |
| | **Scientific Name** | **Common Name** |
| | ***Torillis arvensis*** | spreading field parsley |
| | *Torillis nodosa* | knotted hedge-parsley |
| | *Urtica urens* | small nettle |
| | ***Valerianella dentata*** | narrow-fruited cornsalad |
| | *Valerianella rimosa* | broad-ruited cornsalad |
| | *Veronica agrestis* | green field-speedwell |
| | *Viola arvensis* | field pansy |

**Table 3 Indicator species for Lowland Meadow grasslands in South Wales.**

| *Scientific Name* | Common Name |
|---|---|
| *Achillea ptarmica* | sneezewort |
| *Agrimonia eupatoria* | agrimony |
| *Agrimonia procera* | fragrant agrimony |
| *Ajuga reptans* | Bugle |
| *Alchemilla glabra* | lady's-mantle |
| *Alchemilla filicaulis* | lady's-mantle |
| *Alchemilla xanthochlora* | lady's-mantle |
| *Allium vineale* | wild onion |
| *Botrychium lunaria* | moonwort |
| *Briza media* | quaking grass |
| *Bromus commutatus* | meadow brome |
| *Bromus racemosus* | smooth brome |
| *Campanula rotundiflora* | harebell |
| *Cardamine pratensis* | cuckoo flower |
| *Carex caryophyllea* | spring sedge |
| *Carex divulsa* | grey sedge |
| *Carex flacca* | glaucous sedge |
| *Carex montana* | soft-leaved sedge |
| *Carex muricata* | prickly sedge |
| *Carex nigra* | common sedge |
| *Carex panicea* | carnation sedge |
| *Carex spicata* | spiked sedge |
| *Centaurea nigra* | common knapweed |
| *Centaurium erythraea* | common centuary |
| *Cirsium dissectum* | meadow thistle |
| *Colchicum autumnale* | meadow saffron |
| *Conopodium majus* | pignut |
| *Dactylorhiza spp.* | spotted orchids |
| *Danthonia decumbens* | heath grass |
| *Erophila verna* | whitlow grass |
| *Euphrasia officinalis agg.* | eyebright |
| *Festuca arundinacia* | tall fescue |
| *Festuca pratensis* | meadow fescue |
| *Galium verum* | lady's bedstraw |
| *Genista tinctoria* | dyer's greenweed |
| *Geranium pratense* | meadow crane's-bill |
| *Helictotrichon pubescens* | downy oat-grass |
| *Hordeum secalinum* | meadow barley |
| *Hypericum hirsutum* | hairy St John's-wort |
| *Hypericum maculatum* | imperforate St John's-wort |
| *Hypericum perforatum* | perforate St John's-wort |
| *Hypochoeris radicata* | common cat's-ear |
| *Knautia arvensis* | field scabious |
| *Koeleria macrantha* | crested hair grass |
| *Lathyrus linifolius* | bitter-vetch |
| *Lathyrus nissolia* | grass vetchling |
| *Lathyrus pratensis* | meadow vetchling |
| *Leontodon hispidus* | rough hawkbit |
| *Leontodon saxatilis* | lesser hawkbit |
| *Leucanthemum vulgare* | oxeye daisy |
| *Linum catharticum* | fairy flax |
| *Listera ovata* | common twayblade |
| *Lotus corniculatus* | common bird's-foot-trefoil |
| *Lotus glaber* | narrow-leaved bird's-foot-trefoil |
| *Luzula campestris* | field wood-rush |
| *Narcissus pseudonarcissus* | wild daffodil |

| *Scientific Name* | **Common Name** |
|---|---|
| *Ononis repens* | common restharrow |
| *Ononis spinosa* | spiny restharrow |
| *Ophioglossum vulgatum* | adder's-tongue |
| *Orchis mascula* | early-purple orchid |
| *Orchis morio* | green-winged orchid |
| *Pedicularis sylvatica* | lousewort |
| *Petroselinum segetum* | corn parsley |
| *Phleum bertolonii* | small cat's-tail |
| *Pilosella officinarum* | mouse-ear hawkweed |
| *Pimpinella saxifraga* | burnet-saxifrage |
| *Plantago media* | hoary plantain |
| *Platanthera chlorantha* | greater butterfly-orchid |
| *Poa angustifolia* | narrow-leaved meadow-grass |
| *Poa humilis* | spreading meadow-grass |
| *Polygala vulgaris* | common milkwort |
| *Polygonum bistorta* | common bistort |
| *Potentilla anglica* | trailing tormentil |
| *Potentilla erecta* | tormentil |
| *Primula veris* | cowslip |
| *Ranunculus bulbosus* | bulbous buttercup |
| *Rhinanthus minor* | yellow rattle |
| *Sanguisorba minor* | salad burnet |
| *Sanguisorba officionalis* | greater burnet |
| *Saxifraga granulata* | meadow saxifrage |
| *Saxifraxa tridactyloides* | rue-leaved saxifrage |
| *Senecio erucifolius* | hoary ragwort |
| *Serratula tinctoria* | saw-wort |
| *Silaum silaus* | pepper-saxifrage |
| *Sison amomum* | stone parsley |
| *Stachys officinalis* | betony |
| *Stellaria graminea* | lesser stitchwort |
| *Succisa pratensis* | devil's-bit scabious |
| *Thalictrum flavum* | common meadow-rue |
| *Thymus pulegioides* | large thyme |
| *Torilis nodosa* | knotted hedge-parsley |
| *Trifolium fragiferum* | strawberry clover |
| *Trifolium medium* | zig-zag clover |
| *Trifolium micranthum* | slender trefoil |
| *Trifolium pratense* | red clover |
| *Trifolium scabrum* | rough clover |
| *Trifolium striatum* | knotted clover |
| *Trisetum flavescens* | yellow oat-grass |
| *Veronica officionalis* | heath speedwell |
| *Vicia cracca* | tufted vetch |
| *Vicia orobus* | wood bitter-vetch |
| *Vicia riviniana* | common dog-violet |
| *Vulpia bromoides* | squirreltail fescue |

**Table 4 Indicator species for Calcareous Grasslands in South Wales.**

| Scientific Name | Common Name |
|---|---|
| *Allium vineale* | wild onion |
| *Aloina aloides* | common aloe-moss |
| *Anacamptis pyramidalis* | pyramidal orchid |
| *Anthyllis vulneraria* | kidney vetch |
| *Arabis hirsuta* | hairy rock-cress |
| *Asperula cynanchica* | squincywort |
| *Blackstonia perfoliata* | yellow-wort |
| *Brachypodium pinnatum* | tor grass |
| *Briza media* | quaking grass |
| *Bromopsis erecta* | upright brome |
| *Campanula glomerata* | clustered bellflower |
| *Campanula rotundiflora* | harebell |
| *Campanula trachelium* | nettle-leaved bellflower |
| *Carex caryophyllea* | spring sedge |
| *Carex flacca* | glaucous sedge |
| *Carex montana* | soft-leaved sedge |
| *Carlina vulgaris* | carline thistle |
| *Centaurea nigra* | common knapweed |
| *Centaurea scabiosa* | greater knapweed |
| *Centaurium erythraea* | common centuary |
| *Cirsium acaule* | dwarf thistle |
| *Cirsium eriophorum* | woolly thistle |
| *Cirsium tuberosum* | tuberous thistle |
| *Clinopodium acinos* | basil thyme |
| *Clinopodium ascendens* | common calamint |
| Clinopodium calamintha | lesser calamint |
| *Clinopodium vulgare* | wild basil |
| *Coeloglossum viride* | frog orchid |
| *Crepis biennis* | rough hawk's-beard |
| *Cruciata laevipes* | crosswort |
| *Daucus carota* | wild carrot |
| *Ditrichum flexicaule* | bendy ditrichum |
| *Ditrichum gracile* | slender ditrichum |
| *Echium vulgare* | viper's-bugloss |
| *Erophila verna* | whitlow grass |
| *Festuca ovina agg.* | sheep's fescue |
| *Galium mollugo* | hedge bedstraw |
| *Galium sterneri* | limestone bedstraw |
| *Galium verum* | lady's bedstraw |
| *Genista tinctoria* | dyer's greenweed |
| *Gentianella amarella* | autumn gentian |
| *Geranium columbinum* | long-stalked crane's-bill |
| *Helianthemum nummularium* | common rock-rose |
| *Helictotrichon pratense* | meadow oat-grass |
| *Helictotrichon pubescens* | downy oat-grass |
| *Hippocrepis comosa* | horseshoe vetch |
| *Homalothecium lutescens* | yellow feather-moss |
| *Hypericum hirsutum* | hairy St John's-wort |
| *Hypericum montanum* | pale St John's-wort |
| *Hypericum perforatum* | perforate St John's-Wort |
| *Inula conyzae* | ploughman's spikenard |
| *Knautia arvensis* | field scabious |
| *Koeleria macrantha* | crested hair-grass |
| *Lathyrus nissolia* | grass vetchling |

| | |
|---|---|
| *Leiocolea turbinata* | top notchwort |
| *Leontodon hispidus* | rough hawkbit |
| ***Scientific Name*** | **Common Name** |
| *Leontodon saxatilis* | lesser hawkbit |
| *Linum catharticum* | fairy flax |
| *Listera ovata* | twayblade |
| *Lotus corniculatus* | common bird's-foot trefoil |
| *Medicago lupulina* | black medick |
| *Ononis repens* | common restharrow |
| *Ononis spinosa* | spiny restharrow |
| *Ophioglossum vulgatum* | adder's-tongue |
| *Ophrys apifera* | bee orchid |
| *Orchis mascula* | early-purple orchid |
| *Orchis morio* | green-winged orchid |
| *Origanum vulgare* | wild majoram |
| *Pastinaca sativa* | wild parsnip |
| *Petroselinum segetum* | corn parsley |
| *Picris hieracioides* | hawkweed oxtongue |
| *Pilosella officinarum* | mouse-ear hawkweed |
| *Pimpinella saxifraga* | burnet-saxifrage |
| *Plantago media* | hoary plantain |
| *Platanthera chlorantha* | greater butterfly-orchid |
| *Poa angustifolia* | narrow-leaved meadow-grass |
| *Poa humilis* | spreading meadow-grass |
| *Polygala vulgaris* | common milkwort |
| *Potentilla sterilis* | barren strawberry |
| *Primula veris* | cowslip |
| *Ranunculus bulbosus* | bulbous buttercup |
| *Rhodobryum roseum* | rose-moss |
| *Sagina nodosa* | knotted pearlwort |
| *Sanguisorba minor* | salad burnet |
| *Saxifraga hypnoides* | mossy saxifrage |
| *Saxifraga tridactylites* | rue-leaved saxifrage |
| *Scabiosa columbaria* | small scabious |
| *Senecio erucifolius* | hoary ragwort |
| *Serratula tinctoria* | saw-wort |
| *Sherardia arvensis* | field madder |
| *Sison amomum* | stone parsley |
| *Spiranthes spiralis* | autumn lady's-tresses |
| *Thalictrum minus* | lesser meadow-rue |
| *Thymus polytrichus* | wild thyme |
| *Thymus pulegioides* | large thyme |
| *Torilis nodosa* | knotted hedge-parsley |
| *Trichostomum brachydontium* | variable crisp-moss |
| *Trichostomum crispulum* | curly crisp-moss |
| *Trifolium campestre* | hop trefoil |
| *Trifolium scabrum* | rough clover |
| *Trifolium striatum* | knotted clover |
| *Trisetum flavescens* | yellow oat-grass |
| *Veronica arvensis* | wall speedwell |
| *Viola hirta* | hairy violet |
| *Viola riviniana* | common dog-violet |
| *Vulpia bromoides* | squirreltail fescue |
| *Weissia controversa* | a moss |
| *Weissia brachycarpa* | small-mouthed beardless moss |

## Table 5 Indicator species for lowland dry acid grasslands in South Wales

| | |
|---|---|
| *Agrostis curtisii* | bristle bent |
| *Agrostis vinealis* | brown bent |
| *Aira caryophyllea* | silver hair-grass |
| *Aira praecox* | early hair-grass |
| *Botrychium lunaria* | moonwort |
| *Calluna vulgaris* | ling heather |
| *Campanula rotundiflora* | harebell |
| *Carex caryophyllea* | spring sedge |
| *Carex pilulifera* | pill sedge |
| *Carex muricata* | prickly sedge |
| *Cirsium dissectum* | meadow thistle |
| *Conopodium majus* | pignut |
| *Dactylorhiza maculata* | heath spotted-orchid |
| *Danthonia decumbens* | heath grass |
| *Deschampsia flexuosa* | wavy hair-grass |
| *Dicranum scoparium* | broom fork-moss |
| *Erica cinerea* | bell-heather |
| *Erophila verna* | whitlow grass |
| *Festuca ovina* | sheep's fescue |
| *Agrostis curtisii* | bristle bent |
| *Galium saxatile* | heath bedstraw |
| *Hieracium spp.* | hawkweed spp. |
| *Hylocomium splendens* | glittering wood-moss |
| *Hypericum humifusum* | trailing St John's-wort |
| *Hypericum pulchrum* | slender St John's-wort |
| *Jasione montana* | sheep's bit |
| *Juncus squarrosus* | heath rush |
| *Lathyrus linifolius* | bitter vetch |
| *Luzula multiflora* | heath wood-rush |
| *Lycopodium clavatum* | stag's-horn clubmoss |
| *Moenchia erecta* | upright chickweed |
| *Nardus stricta* | mat grass |
| *Ophioglossum vulgatum* | adder's-tongue |
| *Ornithopus perpusillus* | bird's-foot |
| *Pedicularis sylvatica* | lousewort |
| *Pilosella officinarum agg.* | mouse ear-hawkweed |
| *Pleurozium schreberi* | red-stemmed feather moss |
| *Polygala serpyllifolia* | heath milkwort |
| *Polytrichum formosum* | bank hair-cap |
| *Potentilla anglica* | trailing tormentil |
| *Potentilla erecta* | tormentil |
| *Rumex acetosella* | sheeps sorrel |
| *Senecio sylvaticus* | heath groundsel |
| *Solidago virgaurea* | goldenrod |
| *Spergularia rubra* | sand spurrey |
| *Stachys officinalis* | betony |
| *Succisa pratensis* | devil's-bit scabious |
| *Trifolium scabrum* | rough clover |
| *Trifolium striatum* | knotted clover |
| *Vaccinium myrtillus* | bilberry |
| *Veronica officinalis* | heath speedwell |
| *Viola canina* | heath dog-violet |
| *Viola lutea* | mountain pansy |
| *Vulpia bromoides* | squirreltail fescue |

**Table 6 Indicator species for purple moorgrass and rush pasture in South Wales.**

| Scientific Name | Common Name |
|---|---|
| *Achillea ptarmica* | sneezewort |
| *Agrostis canina* | velvet bent |
| *Agrostis curtisii* | bristle bent |
| *Anagallis tenella* | bog pimpernel |
| *Angelica sylvestris* | wild angelica |
| *Apium graveolens* | celery |
| *Apium inundatum* | lesser marshwort |
| *Apium nodiflorum* | fool's-water-cress |
| *Bidens cernua* | nodding bur-marigold |
| *Bidens tripartita* | trifid bur-marigold |
| *Briza media* | quaking grass |
| *Calamagrostis epigejos* | wood small-reed |
| *Caltha palustris* | marsh marigold |
| *Cardamine pratensis* | cuckoo flower |
| *Carex acuta* | slender tufted-sedge |
| *Carex acutiformis* | lesser pond-sedge |
| *Carex binervis* | green-ribbed sedge |
| *Carex disticha* | brown sedge |
| *Carex echinata* | star sedge |
| *Carex flacca* | glaucous sedge |
| *Carex hostiana* | tawny sedge |
| *Carex laevigata* | smooth-stalked sedge |
| *Carex montana* | soft-leaved sedge |
| *Carex nigra* | common sedge |
| *Carex ovalis* | oval sedge |
| *Carex pallescens* | pale sedge |
| *Carex panicea* | carnation sedge |
| *Carex paniculata* | greater tussock-sedge |
| *Carex pendula* | pendulous sedge |
| *Carex pseudocyperus* | cyperus sedge |
| *Carex pulicaris* | flea sedge |
| *Carex riparia* | greater pond-sedge |
| *Carex rostrata* | bottle sedge |
| *Carex vesicaria* | bladder sedge |
| *Carex viridula* | common yellow-sedge |
| *Carum verticillatum* | whorled caraway |
| *Cirsium dissectum* | meadow thistle |
| *Dactylorhiza spp.* | spotted or marsh orchids |
| *Dipsacus pilosus* | small teasel |
| *Drosera rotundifolia* | round-leaved sundew |
| *Dryopteris carthusiana* | narrow buckler-fern |
| *Eleocharis spp.* | spike-rush spp. |
| *Epipactis palustris* | marsh helleborine |
| *Equisetum palustre* | marsh horsetail |
| *Equisetum sylvaticum* | wood horsetail |
| *Equisetum telemateia* | great horsetail |
| *Erica tetralix* | cross-leaved heath |
| *Eriophorum angustifolium* | common cottongrass |
| *Eriophorum latifolium* | broad-leaved cottongrass |
| *Eupatorium cannabinum* | hemp agrimony |
| *Filipendula ulmaria* | meadowsweet |
| *Galium palustre* | common marsh-bedstraw |

| Scientific Name | Common Name |
|---|---|
| *Galium uliginosum* | fen bedstraw |
| *Genista anglica* | petty whin |
| *Geum rivale* | water avens |
| *Glyceria declinata* | small sweet-grass |
| *Glyceria fluitans* | floating sweet-grass |
| *Glyceria maxima* | reed sweet-grass |
| *Glyceria notata* | plicate sweet-grass |
| *Hydrocotyle vulgaris* | marsh pennywort |
| *Hypericum elodes* | marsh St John's-wort |
| *Hypericum tetrapterum* | square-stalked St John's-wort |
| *Iris pseudacorus* | yellow flag-iris |
| *Isolepis setacea* | bristle club-rush |
| *Juncus acutiflorus* | sharp-flowered rush |
| *Juncus articulatus* | jointed rush |
| *Juncus conglomeratus* | compact rush |
| *Juncus squarrosus* | heath rush |
| *Juncus subnodulosus* | blunt-flowered rush |
| *Lotus uliginosus* | greater bird's-foot-trefoil |
| *Luzula multiflora* | heath wood-rush |
| *Lychnis flos-cuculi* | ragged robin |
| *Lycopus europaeus* | gypsywort |
| *Lysimachia nemorum* | yellow pimpernel |
| *Lysimachia nummularia* | creeping-jenny |
| *Lysimachia vulgaris* | yellow loosestrife |
| *Lythrum portula* | water purslane |
| *Lythrum salicaria* | purple loosestrife |
| *Mentha aquatica* | water mint |
| *Menyanthes trifoliata* | bogbean |
| *Molinia caerulea* | purple moor-grass |
| *Montia fontana* | blinks |
| *Myosotis laxa* | tufted forget-me-not |
| *Myosotis scorpioides* | water forget-me-not |
| *Myosotis secunda* | creeping forget-me-not |
| *Myrica gale* | bog myrtle |
| *Narthecium ossifragum* | bog asphodel |
| *Oenanthe aquatica* | fine-leaved water-dropwort |
| *Oenanthe crocata* | hemlock water-dropwort |
| *Oenanthe fistulosa* | tubular water-dropwort |
| *Osmunda regalis* | royal fern |
| *Pedicularis palustris* | marsh lousewort |
| *Pedicularis sylvatica* | lousewort |
| *Persicaria amphibia* | amphibious bistort |
| *Persicaria bistorta* | common bistort |
| *Phalaris arundinacea* | reed canary-grass |
| *Phragmites australis* | common reed |
| *Pinguicula vulgaris* | common butterwort |
| *Polygala serpyllifolia* | heath milkwort |
| *Potentilla erecta* | tormentil |
| *Potentilla palustris* | marsh cinquefoil |
| *Pulicaria dysenterica* | common fleabane |
| *Ranunculus flammula* | lesser spearwort |
| *Ranunculus sceleratus* | celery-leaved buttercup |
| *Rumex conglomeratus* | clustered dock |
| *Rumex hydrolapathum* | water dock |
| *Sagina nodosa* | knotted pearlwort |

| | |
|---|---|
| *Salix repens* | creeping willow |
| *Scirpus sylvaticus* | wood club-rush |

| Scientific Name | Common Name |
|---|---|
| *Scrophularia auriculata* | water figwort |
| *Scutellaria galericulata* | skullcap |
| *Scutellaria minor* | lesser skullcap |
| *Senecio aquaticus* | marsh ragwort |
| *Serratula tinctoria* | saw-wort |
| *Sibthorpia europaea* | cornish moneywort |
| *Stachys officinalis* | betony |
| *Stachys palustris* | marsh woundwort |
| *Stellaria alsine* | bog stitchwort |
| *Succisa pratensis* | devil's-bit scabious |
| *Thalictrum flavum* | common meadow-rue |
| *Thelypteris palustris* | marsh fern |
| *Trichophorum cespitosum* | deergrass |
| *Triglochin palustre* | marsh arrowgrass |
| *Trollius europaeus* | globeflower |
| *Vaccinium oxycoccos* | cranberry |
| *Valeriana dioica* | marsh valerian |
| *Valeriana officinalis* | common valerian |
| *Veronica anagallis-aquatica* | blue water-speedwell |
| *Veronica beccabunga* | brooklime |
| *Veronica catonata* | pink water-speedwell |
| *Veronica scutellata* | marsh speedwell |
| *Viola palustris* | marsh violet |
| *Wahlenbergia hederacea* | ivy-leaved bell-flower |

| **Table 7 Vascular Plants with Restricted Distributions found in Standing Water Habitats in Powys** | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Butomus umbellatus* | Flowering-rush | X | - | X |
| *Callitriche hermaphroditica* | Autumnal Water-starwort | X | - | X |
| *Carex acuta* | Slender Tufted-sedge | X | X | X |
| *Carex elata* | Tufted-sedge | X | - | X |
| *Carex lasiocarpa* | Slender Sedge | X | - | X |
| *Ceratophyllum demersum* | Rigid Hornwort | X | X | X |
| *Cladium mariscus* | Great Fen-sedge | X | - | X |
| *Eleocharis acicularis* | Needle Spike-rush | X | X | X |
| *Hippuris vulgaris* | Mare's-tail | X | - | - |
| *Lemna gibba* | Fat Duckweed | X | - | X |
| *Luronium natans* | Floating Water-plantain | X | - | X |
| *Myosoton aquaticum* | Water Chickweed | X | X | X |
| *Myriophyllum verticillatum* | Whorled Water-milfoil | X | X | X |
| *Oenanthe fistulosa* | Tubular Water-dropwort | X | X | X |
| *Pilularia globulifera* | Pillwort | X | X | - |
| *Potamogeton gramineus* | Various-leaved Pondweed | X | - | - |
| *Potamogeton lucens* | Shining Pondweed | X | | X |
| *Potamogeton pectinatus* | Fennel Pondweed | X | X | X |
| *Potamogeton perfoliatus* | Perfoliate Pondweed | X | X | X |
| *Potamogeton pusillus* | Lesser Pondweed | X | - | X |
| *Ranunculus circinatus* | Fan-leaved Water-crowfoot | X | - | X |
| *Ranunculus fluitans* | River Water-crowfoot | X | X | - |
| *Ranunculus tripartitus* | Three-lobed Crowfoot | X | X | - |
| *Rorippa microphyllum* | Narrow-fruited Water-cress | X | - | X |
| *Rorippa microphyllum/officinale* | hybrid | X | X | X |
| *Schoenoplectus lacustris ssp. lacustris* | Common Club-rush | X | - | X |
| *Sparganium angustifolium* | Floating Bur-reed | X | - | - |
| *Sparganium minimum* | Least Bur-reed | X | - | - |
| *Spirodela polyrhiza* | Greater Duckweed | X | - | X |
| *Typha angustifolia* | Lesser Bulrush | X | X | - |
| *Utricularia minor* | Lesser Bladderwort | X | X | X |
| *Veronica anagallis-aquatica* | Blue Water-speedwell | X | X | X |
| *Veronica catenata* | Pink Water-speedwell | X | - | X |
| *Zanichellia palustris* | Horned Pondweed | X | X | - |

| Table 7 Plant Species with restricted distributions found in Inland Rock Outcrops and Scree Habitats in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Botrychium lunaria* | moonwort | X | X | X |
| *Cardamine impatiens* | narrow-leaved bitter-cress | X | - | X |
| *Carex montana* | soft-leaved sedge | X | - | - |
| *Corydalis claviculata* | climbing corydalis | X | - | X |
| *Cryptogramma crispa* | parsley fern | X | X | X |
| *Cystopteris fragilis* | brittle bladder-fern | X | X | X |
| *Diphasiastrum alpinum* | alpine clubmoss | X | X | X |
| *Genista pilosa* | hairy greenweed | X | - | - |
| *Gymnocarpium dryopteris* | oak fern | X | X | X |
| *Gymnocarpium robertianum* | limestone fern | X | X | X |
| *Lycopodium clavatum* | stag's horn moss | X | X | X |
| *Meconopsis cambrica* | welsh poppy | X | X | X |
| *Melica nutans* | mountain melick | X | X | X |
| *Minuartia verna* | spring sandwort | X | - | - |
| *Mycelis muralis* | wall lettuce | X | X | X |
| *Rhamnus catharticus* | buckthorn | X | X | X |
| *Sedum forsterianum* | rock stonecrop | X | X | X |
| *Sorbus leptophylla* | | X | - | X |
| *Sorbus leyana* | | X | - | - |
| *Sorbus minima* | | X | - | - |
| *Sorbus porrigentiformis* | | X | X | X |
| *Sorbus rupicola* | | X | - | X |
| *Thalictrum minus* | Lesser Meadow-rue | X | X | X |
| *Viola lutea* | Mountain Pansy | X | X | X |

Based on information supplied by Marcus Yeo, pers comm

| Table 8 Plant Species found in Inland Rock Outcrops and Scree Habitats in Powys | | | | |
|---|---|---|---|---|
| | | **B** | **R** | **M** |
| *Angelica sylvestris* | wild angelica | X | X | X |
| *Asplenium ruta-muraria* | wall-rue | X | X | X |
| *Asplenium trichomanes* | maidenhair spleenwort | X | X | X |
| *Asplenium viride* | green spleenwort | X | X | - |
| *Calluna vulgaris* | ling | X | X | X |
| *Ctenidium molluscum* | chalk comb-moss | X | X | X |
| *Deschampsia cespitosa* | tufted hair-grass | X | X | X |
| *Dryopteris oreades* | mountain male-fern | X | - | X |
| *Erica tetralix* | cross-leaved heath | X | X | X |
| *Fissidens cristatus* | rock pocket-moss | X | - | - |
| *Geum rivale* | water avens | X | X | X |
| *Homalothecium sericeum* | silky wall-feather moss | X | X | X |
| *Hylocomium splendens* | glittering wood-moss | X | X | X |
| *Luzula sylvatica* | great wood-rush | X | X | X |
| *Porella platyphylla* | wall scalewort | X | X | - |
| *Sorbus aucuparia* | rowan | X | X | X |
| *Taxus baccata* | yew | X | X | X |
| *Teucrium scorodonia* | wood sage | X | X | X |
| *Tortella tortuosa* | frizzled crisp-moss | X | X | X |
| *Ulex gallii* | western gorse | X | X | X |
| *Vaccinium myrtillus* | bilberry | X | X | X |

**Table 9 Indicator species for Open Mosaic Habitats on Previously Developed Land in South Wales**

| Scientific Name | Common Name |
|---|---|
| *Agostis vineale* | brown bent |
| *Aira caryophyllea* | silver hair grass |
| *Aira praecox* | early hair grass |
| *Anthemis arvensis* | corn chamomile |
| *Anthemis cotula* | stinking chamomile |
| *Arctium lappa* | greater burdock |
| *Arctium minus* | lesser burdock |
| *Artemisia absinthium* | wormwood |
| *Atriplex patula* | common orache |
| *Atriplex prostrata* | spear-leaved orache |
| *Ballota nigra* | black horehound |
| *Barbilophozia floerkei* | common pawwort |
| *Beta vulgaris* | sea beet |
| *Calluna vulgaris* | heather |
| *Carduus crispus* | welted thistle |
| *Carduus nutans* | musk thistle |
| *Carduus tenuiflorus* | slender thistle |
| *Carex arenaria* | sand sedge |
| *Carex otrubae* | false fox-sedge |
| *Carex pilulifera* | pill sedge |
| *Catapodium rigidum* | fern grass |
| *Centaurea cyanus* | cornflower |
| *Chaenorhinum minus* | small toadflax |
| *Chenopodium album* | fat hen |
| *Chenopodium bonus-henricus* | good-king-Henry |
| *Chenopodium ficifolium* | fig-leaved goosefoot |
| *Chenopodium hybridum* | maple-leaved goosefoot |
| *Chenopodium polyspermum* | many-seeded goosefoot |
| *Chenopodium rubrum* | red goosefoot |
| *Chrysanthemum segetum* | corn marigold |
| *Cichorium intybus* | chicory |
| *Crepis biennis* | rough hawk's-beard |
| *Crepis capillaris* | smooth hawk's-beard |
| *Deschampsia flexuosa* | wavy hair grass |
| *Dipsacus fullonum* | teasel |
| *Erica cinerea* | bell heather |
| *Festuca ovina* | sheeps fescue |
| *Filago minima* | small cudweed |
| *Filago vulgaris* | common cudweed |
| *Galeopsis bifida* | bifid hemp-nettle |
| *Galeopsis speciosa* | large-flowered hemp-nettle |
| *Galeopsis tetrahit* | common hemp-nettle |
| *Gnaphalium uliginosum* | marsh cudweed |
| *Kickxia elatine* | sharp-leaved fluellen |
| *Kickxia spuria* | round-leaved fluellen |
| *Lactuca serriola* | prickly lettuce |
| *Lactuca virosa* | great lettuce |
| *Lamium amplexicaule* | henbit dead-nettle |
| *Lamium hybridum* | cut-leaved dead-nettle |
| *Linaria repens* | pale toadflax |
| *Linaria vulgaris* | common toadflax |
| *Lophozia ventricosa* | tumid notchwort |

| Scientific Name | Common Name |
|---|---|
| *Lotus corniculatus* | birds-foot trefoil |
| *Matricaria recutita* | scented mayweed |
| *Matricaria recutita* | scented mayweed |
| *Marrubium vulgare* | white horehound |
| *Mentha arvensis* | corn mint |
| *Misopates orontium* | weasel's-snout |
| *Onopordum acanthium* | cotton thistle |
| *Orobanche minor* | common broomrape |
| *Parentucellia viscosa* | yellow bartsia |
| *Picris echioides* | bristly oxtongue |
| *Plantago coronopus* | buck's-horn plantain |
| *Pilosella officinarium agg.* | mouse-ear hawkweed |
| *Poa compressa* | flattened meadow-grass |
| *Ptilidium ciliare* | ciliated fringewort |
| *Rumex acetosa* | common sorrel |
| *Scrophularia nodosa* | common figwort |
| *Spergularia rubra* | sand spurrey |
| *Tanacetum vulgare* | tansy |
| *Teucrium scorodonia* | wood sage |
| *Thymus polytrichus* | wild thyme |
| *Tragopogon pratensis* | goat's-beard |
| *Trifolium striatum* | knotted clover |
| *Trifolium scabrum* | rough clover |
| *Trifolium campestre* | hop trefoil |
| *Trifolium micranthum* | slender trefoil |
| *Tussilago farfara* | colt's-foot |
| *Vaccinium myrtillus* | bilberry |
| *Valerianella carinata* | keeled-fruited cornsalad |
| *Valerianella locusta* | common cornsalad |
| *Verbascum nigrum* | dark mullein |
| *Verbascum thapsus* | great mullein |
| *Veronica agrestis* | green field-speedwell |
| *Vulpia bromoides* | squirreltail fescue |
| *Vulpia myuros* | rat's-tail fescue |

# APPENDIX 2

## Wales and UK Priority Habitat Targets disaggregated by Habitat Type

The accompanying targets and tables presents an attempt at uniting the new Wales and where appropriate UK targets with the break down the new Welsh BAP habitat targets for each LBAP area.

The underlying principle behind this exercise is that the value of the targets for maintenance, restoration, expansion and condition have been derived in direct proportion to the amount of the habitat present in each LBAP. This figure has been taken from Jones *et al*, (2003). However, for many of the habitats presented, the new baseline figure for the habitat used during the target review exercise differs, mostly only slightly, from that given in PHW. This may be due to an acknowledged decline in the habitat area during the intervening period between the Habitat Survey of Wales and the setting of Welsh targets (especially so for grasslands). Woodland figures are very different because the definition of what is included within the woodland HAP has been extended to include all native woodland. Additionally, further examination of the Welsh target by FC Wales, has shown that there is an overestimation of the amount of native woodland in the target review figures. An alternative, lower total habitat area is therefore given alongside the published figure in the accompanying table. Data on the amount of woodland habitat in each LBAP can only be derived from the Habitat Survey of Wales; it is assumed that the distribution is similarly spread across LBAPs for the higher baseline values of native woodland used in the examples.

Hedgerow and arable margin targets have been set for Wales, but as comprehensive data is not available at this time, figures for Welsh LBAPs have not been provided. Priority areas for hedgerow and arable action have been identified in the spreadsheet.

All figures in the tables have been rounded to the nearest number if less than 1 (>1). The LBAPs partnerships holding greater than 1% of the total resource are given an equal share of the target, despite their actual percentage contribution.

For several of the present habitats, and all the new S42 habitats (**Ω**), the UK specialist groups have yet to set the full range of targets for restoration, expansion or condition improvement. These are shown as blanks in the table for the existing habitats and ? for the new S42 habitats. Once these figures become available, this appendix will be update. The full Wales or UK targets where appropriate can be seen in Appendix 2.

In all cases, the areas of habitat given on the tables should be used as an indication of the amount of habitat that would be required to meet the Welsh targets when summed over the whole of Wales. They are not meant to be prescriptive, just a guide to the relative amounts of restoration or expansion that need to be undertaken if we are to meet our targets. LBAP partnerships may decide to, or have the opportunity to do much more in some circumstances. CCW have tried to indicate the priority LBAP areas for action for each habitat on a scale of 1=highest and 5= lowest. Again these are indicative only and are not meant to reflect in any judgemental way on the habitat present in each LBAP area. [After Liz Howe, CCW.]

## TERRESTRIAL AND FRESHWATER HABITAT TARGETS.

### H1) BROADLEAVED, MIXED, AND YEW WOODLAND

### H1:1) TRADITIONAL ORCHARDS Ω

## H1:2) WOOD PASTURE & PARKLAND

The 2006 Welsh Wood Pasture and Parkland Targets are as follows:

**T1**. Maintenance Target

No loss of or significant damage to the extent of known wood-pasture and parkland sites.

**T2**.Achieving condition

1,044 sites (70% of the known resource) to be in favourable or recovering condition by 2015.

**T3**. Restoration

Restore areas of derelict wood-pasture & parkland to favourable condition (target 62 sites by 2010).

**T4**. Expansion

Expand the area of wood-pasture and parkland, in appropriate areas, to help reverse fragmentation and reduce the generation gap between veteran trees at 16 sites by 2015.

| Welsh LBAP area | Sites (PHW) | % Welsh resource | T1. Maintenance target | T2. Achieve condition | T3. Restoration target | T4. Expansion target | Proposed Priority LBAP areas |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 7 | 3.5 | 53 | 37 | 2 | 1 | 1 |
| **Snowdonia NP** | 8 | 4 | 60 | 42 | 2 | 1 | 2 |
| **Gwynedd** | 8 | 4 | 60 | 42 | 2 | 1 | 2 |
| **Conwy** | 10 | 5 | 75 | 53 | 3 | 1 | 2 |
| **Denbighshire** | 23 | 11 | 165 | 116 | 7 | | 1 |
| **Flintshire** | 10 | 5 | 75 | 53 | 3 | 1 | 2 |
| **Wrexham** | 12 | 6 | 90 | 63 | 4 | 1 | 1 |
| **Powys** | 43 | 21 | 315 | 221 | 13 | 4 | 1 |
| **Ceredigion** | 14 | 7 | 105 | 74 | 4 | 1 | 1 |
| **Carmarthenshire** | 9 | 4.5 | 68 | 47 | 3 | 1 | 1 |
| **Pembrokeshire** | 6 | 3 | 45 | 32 | 2 | 1 | 3 |
| **Brecon Beacons NP** | 11 | 5.5 | 83 | 58 | 3 | 1 | 2 |
| **Swansea** | 3 | 1.5 | 23 | 16 | 1 | 0 | 2 |
| **Neath Port Talbot** | 3 | 1.5 | 23 | 16 | 1 | 0 | 2 |
| **Bridgend** | 1 | 0.5 | 8 | 5 | 1 | 0 | 3 |
| **Rhondda-Cynon-Taff** | 2 | 1 | 15 | 11 | 1 | 0 | 3 |
| **Vale of Glamorgan** | 4 | 2 | 30 | 21 | 1 | 0 | 3 |
| **Cardiff** | 2 | 1 | 15 | 11 | 1 | 0 | 3 |
| **Torfaen** | 1 | 0.5 | 8 | 5 | 1 | 0 | 3 |
| **Monmouthshire** | 21 | 10 | 150 | 105 | 6 | 2 | 1 |
| **Newport** | 3 | 1.5 | 23 | 16 | 1 | 0 | 3 |
| **Wales total** | **201*** | **99** | **1489** | **1044** | **62** | **16** | |

***only includes parklands, not wood pasture**

## H1:3) NATIVE WOODLANDS

The 2006 Welsh Native Woodland HAP Targets are as follows:

**T1.** Maintenance Target

Maintain the net extent of native woodland (124,300 ha in 1995), especially the extent of ancient semi-natural woodland (34,400 ha in 1995).

**T2**. Achieving condition

Achieve favourable or recovering condition of 27,000ha of native woodland (21% of the 1995 total native woodland resource) by 2010.

**T3.** Restoration

Restore 3,700 ha of non-native Plantations on Ancient Woodland Sites (PAWS) (21% of all 1995 non-native PAWS) to native woodland by 2010.

**T4.** Expansion

Expand the area of native woodland by creating 1,600 ha of new native woodlands (1.3% of the 1995 total native woodland resource) on currently unwooded sites by 2010.

The draft Welsh disaggregated Native Woodland HAP targets are:

| **Welsh LBAP area** | **Area (Welsh BAP target)** | **Area (FC Wales estimate)** | **% Welsh resource** | **T1** Maintenance target based on Welsh BAP target | **T1** Maintenance target based on FC Wales figures | **T2.** Achieve Condition | **T3.** Restoration Target | **T4.** Expansion Target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|---|---|
| **Anglesey** | 1243 | 1095 | 1 | 1243 | 1095 | 355 | 49 | 43 | 1 |
| **Snowdonia NP** | 12,430 | 10950 | 10 | 12,430 | 10950 | 3553 | 491 | 426 | 1 |
| **Gwynedd** | 3729 | 3285 | 3 | 3729 | 3285 | 1066 | 147 | 128 | 1 |
| **Conwy** | 3729 | 3285 | 3 | 3729 | 3285 | 1066 | 147 | 128 | 1 |
| **Denbighshire** | 3729 | 3285 | 3 | 3729 | 3285 | 1066 | 147 | 128 | 1 |
| **Flintshire** | 2486 | 2190 | 2 | 2486 | 2190 | 710 | 98 | 85 | 1 |
| **Wrexham** | 2486 | 2190 | 2 | 2486 | 2190 | 710 | 98 | 85 | 1 |
| **Powys** | 24,860 | 21900 | 20 | 24,860 | 21900 | 7106 | 982 | 853 | 1 |
| **Ceredigion** | 8701 | 7665 | 7 | 8701 | 7665 | 2487 | 344 | 298 | 1 |
| **Carmarthenshire** | 17402 | 15330 | 14 | 17402 | 15330 | 4974 | 687 | 597 | 1 |
| **Pembrokeshire** | 9944 | 8760 | 8 | 9944 | 8760 | 2842 | 393 | 341 | 1 |
| **Brecon Beacons N P** | 8701 | 7665 | 7 | 8701 | 7665 | 2487 | 344 | 298 | 1 |
| **Swansea** | 2486 | 2190 | 2 | 2486 | 2190 | 710 | | | 1 |
| **Neath Port Talbot** | 3729 | 3285 | 3 | 3729 | 3285 | 1066 | 147 | 128 | 1 |
| **Bridgend** | 1243 | 1095 | 1 | 1243 | 1095 | 355 | 49 | 43 | 1 |
| **Rhondda-Cynon-Taff** | 2486 | 2190 | 2 | 2486 | 2190 | 710 | 98 | 85 | 1 |
| **Merthyr Tydfil** | 1243 | 1095 | 1 | 1243 | 1095 | 355 | 49 | 43 | 1 |
| **Vale of Glamorgan** | 1243 | 1095 | 1 | 1243 | 1095 | 355 | 49 | 43 | 1 |
| **Cardiff** | 1243 | 1095 | 1 | 1243 | 1095 | 355 | 49 | 43 | 1 |
| **Caerphilly** | 2486 | 2190 | 2 | 2486 | 2190 | 710 | 98 | 85 | 1 |
| **Blaenau Gwent** | 435 | 383 | <1 | 435 | 383 | 124 | 17 | 15 | 1 |
| **Torfaen** | 1243 | 1095 | 1 | 1243 | 1095 | 355 | 49 | 43 | 1 |
| **Monmouthshire** | 6215 | 5475 | 5 | 6215 | 5475 | 1775 | 245 | 215 | 1 |
| **Newport** | 1243 | 1095 | 1 | 1243 | 1095 | 355 | 49 | 43 | 1 |
| **Wales total** | **124,300** | **109,500** | **100** | **124300** | **109500** | **35528** | **4909** | **4263** | |

## H2) BOUNDARY AND LINEAR FEATURES

### H2:1) HEDGEROWS

The 2006 UK Hedgerows HAP Targets are as follows:

**T1.** Maintenance Target
Maintain the net extent of hedgerows across the UK.

**T2.** Maintenance Target
Maintain the overall number of individual, isolated hedgerow trees (estimated by CS 2000 to be 1.8 million in Great Britain in 1998) and the net number of isolated veteran trees (to be estimated for the first time by CS 2007).

**T3.** Achieve Condition Target
Ensure that between 2005 and 2010 hedgerows remain, on average, at least as rich in native woody species.

**T4**. Achieve Condition Target
Achieve favourable condition of 243,000 km (35%) of hedgerows by 2010 and 348,000 km (50%) by 2015. (Target does not include Northern Ireland.)

**T5**. Achieve Condition Target
Reverse the unfavourable condition of over-managed hedgerows across the UK by reducing the proportion of land managers who trim most of their hedges annually to 60% by 2010.

**T6**. Achieve Condition Target
Halt further decline in the condition of herbaceous hedgerow flora in Great Britain by 2010 (and improve their condition by 2015). (Target does not include Northern Ireland.)

**T7**. Achieve Condition Target
Improve the condition of the hedgerow tree population by increasing numbers of young trees (1-4 years) in Great Britain to 40,000 by 2010 and 80,000 by 2015. (Target does not include Northern Ireland.)

**T6**. Expansion Target
Achieve a net increase in the length of hedgerows of an average of 800 km per year in Great Britain to 2010 and 2015 (Target does include Northern Ireland.)

Draft Welsh disaggregated Hedgerow Targets have not been prepared, but some information from Jones et al (2003) is provided below:

| **Welsh LBAP area** | **Length (kms.) (PHW)** | **% Welsh resource** | **T1**. Maintenance target | **T2.** Achieve condition | **T3**. Restoration target | **T8.** Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | | | | | | | 1 |
| **Snowdonia NP** | 8,300 | 17 | | | | | 2 |
| **Gwynedd** | | | | | | | 1 |
| **Conwy** | | | | | | | 1 |
| **Denbighshire** | 5,200 | 11 | | | | | 1 |
| **Flintshire** | | | | | | | 1 |
| **Wrexham** | | | | | | | 1 |
| **Powys** | 9,100 | 19 | | | | | 1 |
| **Ceredigion** | 16,000 | 33 | | | | | 1 |
| **Carmarthenshire** | | | | | | | 1 |
| **Pembrokeshire** | | | | | | | 1 |
| **Brecon Beacons NP** | See Powys | | | | | | 2 |
| **Swansea** | 6,000 | 12 | | | | | 1 |
| **Neath Port Talbot** | | | | | | | 1 |
| **Bridgend** | | | | | | | 1 |
| **Rhondda-Cynon-Taff** | | | | | | | 1 |
| **Merthyr Tydfil** | | | | | | | ? |
| **Vale of Glamorgan** | | | | | | | 1 |
| **Cardiff** | | | | | | | 1 |
| **Caerphilly** | | | | | | | 1 |
| **Blaenau Gwent** | 4,000 | 8 | | | | | ? |
| **Torfaen** | | | | | | | 2 |
| **Monmouthshire** | | | | | | | 2 |
| **Newport** | | | | | | | 2 |
| **Wales total** | **48.600** | **100** | | | | | |

## H3) ARABLE AND HORTICULTURE

### H3:1) ARABLE FIELD MARGINS

The 2006 UK Arable Field Margin HAP Targets are as follows:

**T1.** Expansion Target
Expand the area of cultivated, low-input field margins to 16.3kha by 2010.

**T2.** Expansion Target
Expand the area of margins providing wild bird seed to 20.8kha by 2010.

**T3.** Expansion Target
Expand the area of flower-rich field margins which provide a pollen and nectar source to 12kha by 2010.

**T4**. Expansion Target
Expand the area of permanent grass margins to 27kha by 2010.

**T5**. Achieve Condition Target
Achieve favourable condition on an increasing proportion of the resource of arable field margins by 2010.

Draft Welsh disaggregated Arable Field Margin targets have not been prepared, but some information on distribution taken from Jones et al (2003) is provided below:

| **Welsh LBAP area** | **Arable Area (ha.) (PHW)** | **% Welsh resource** | **Density (ha/ km sq)** | **T1 and 2**. Expansion target | **T3**. Expansion target | **T5.** Achieve Condition | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 2100 | 4 | 2.8 | | | | 1 |
| **Snowdonia NP** | 100 | <1 | <0.1 | | | | 2 |
| **Gwynedd** | 2000 | 3 | 2.2 | | | | 1 |
| **Conwy** | 710 | 1 | 1 | | | | 2 |
| **Denbighshire** | 2400 | 4 | 2.9 | | | | 2 |
| **Flintshire** | 2900 | 5 | 5.9 | | | | 2 |
| **Wrexham** | 3500 | 6 | 7 | | | | 1 |
| **Powys** | 8600 | 14 | 2 | | | | 2 |
| **Ceredigion** | 2200 | 4 | 1.2 | | | | 1 |
| **Carmarthenshire** | 200 | 3 | 0.9 | | | | 1 |
| **Pembrokeshire** | 14000 | 24 | 8.8 | | | | 1 |
| **Brecon Beacons NP** | 2200 | 4 | 1.6 | | | | 2 |
| **Swansea** | 2000 | 3 | 4.8 | | | | 1 |
| **Neath Port Talbot** | 160 | <1 | 0.4 | | | | 2 |
| **Bridgend** | 770 | 1 | 3 | | | | 2 |
| **Rhondda-Cynon-Taff** | 220 | <1 | 0.6 | | | | 2 |
| **Merthyr Tydfil** | 13 | <1 | <0.1 | | | | |
| **Vale of Glamorgan** | 4600 | 8 | 13.5 | | | | 1 |
| **Cardiff** | 340 | <1 | 2.3 | | | | 2 |
| **Caerphilly** | 380 | <1 | 1.2 | | | | 2 |
| **Blaenau Gwent** | 25 | <1 | 0.2 | | | | |
| **Torfaen** | 130 | <1 | 1 | | | | 2 |
| **Monmouthshire** | 6700 | 11 | 9.1 | | | | 1 |
| **Newport** | 1800 | 3 | 8.1 | | | | 2 |
| **Wales total** | **5,900** | **100** | **2.8** | | | | |

## H4) IMPROVED GRASSLAND

### H4:1) COASTAL AND FLOODPLAIN GRAZING MARSH

The 2006 Welsh Coastal and Floodplain Grazing Marsh HAP Targets are as follows:

**T1.** Maintenance Target
Maintain the extent of the existing resource of 39,860 ha of C&FPGM habitat with no net loss. (In particular, ensure that grazing marsh of similar quality is created to landward of flood defences that have been abandoned or breached as sea level rises, by mapping where compensatory habitat will be created in Shoreline Management Plans and other plans set out by statutory agencies).

**T2.** Achieving condition
Maintain the condition of 17,936 ha of C&FPGM habitat where already favourable and establish by 2015, management to secure favourable condition for all areas of grazing marsh currently judged as unfavourable. The target condition for all such areas should be favourable or unfavourable recovering by 2015.

**T3**. Restoration
Restore and improve 4,500 ha of relict habitat that does not qualify as C&FPGM habitat by 2015. (e.g. dry C&FPGM with inappropriate hydrological regime, agriculturally improved sites etc by implementing appropriate management at all sites).

**T4.** Expansion
Re-establish 100 ha of C&FPGM of wildlife value from appropriate land sources (e.g. arable land) by 2015 (which is capable of supporting a diverse range of invertebrates, mammals and breeding waders)

T5. New Landscape Target
Establish 8 new landscape scale wetland complexes by 2020, at least 1 in Wales in which C&FPGM is a major component along other wetland types. This cross-refers to targets in the uplands, lowland raised bog, wet woodlands, fens and reedbed HAPs.

The draft Welsh disaggregated Coastal and Floodplain Grazing Marsh HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2.** Achieve condition | **T3.** Restoration target | **T4.** Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 2900 | 5 | 1993 | 897 | 225 | 5 | 1 |
| **Snowdonia NP** | 4200 | 8 | 3189 | 1435 | 360 | 8 | 1 |
| **Gwynedd** | 3800 | 7 | 2790 | 1256 | 315 | 7 | 1 |
| **Conwy** | 2000 | 4 | 1594 | 717 | 180 | 4 | 1 |
| **Denbighshire** | 3500 | 6 | 2391 | 1076 | 270 | 6 | 1 |
| **Flintshire** | 2500 | 5 | 1993 | 897 | 225 | 5 | 1 |
| **Wrexham** | 2400 | 4 | 1594 | 717 | 180 | 4 | 2 |
| **Powys** | 9300 | 17 | 6776 | 3049 | 765 | 17 | 1 |
| **Ceredigion** | 4700 | 9 | 3587 | 1614 | 405 | 9 | 1 |
| **Carmarthenshire** | 7500 | 14 | 5580 | 2511 | 630 | 14 | 1 |
| **Pembrokeshire** | 1000 | 2 | 797 | 359 | 90 | 2 | 3 |
| **Brecon Beacons NP** | 660 | 1 | 399 | 179 | 45 | 1 | 3 |
| **Swansea** | 540 | 1 | 399 | 179 | 45 | 1 | 3 |
| **Neath Port Talbot** | 680 | 1 | 399 | 179 | 45 | 1 | 2 |
| **Bridgend** | 200 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| **Rhondda-Cynon-Taff** | 130 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| **Vale of Glamorgan** | 930 | 2 | 797 | 359 | 90 | 2 | 3 |
| **Cardiff** | 520 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| **Caerphilly** | 160 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| **Torfaen** | 20 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| **Monmouthshire** | 2700 | 5 | 1993 | 897 | 225 | 5 | 2 |
| **Newport** | 4200 | 8 | 3189 | 1435 | 360 | 8 | 1 |
| **Wales total** | **54,600** | **99** | **39860** | **17936** | **4500** | **100** | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

## H5) NEUTRAL GRASSLAND

### H5:1) LOWLAND MEADOWS

The 2006 Welsh Lowland Meadow Targets are as follows:

**T1.** Maintenance Target
Maintain the current extent of Lowland Meadows in the Wales, approximately 1322 ha. (Target represents no loss of BAP habitat).

T2.Achieving condition (a)
Maintain at least the current condition of Lowland Meadows.

**T3.** Achieving condition (b)
Achieve favourable or recovering condition for 777 ha of Lowland Meadow by 2015.

**T4.** Restoration
Restore 1,554 ha of Lowland Meadow from semi-improved or neglected grassland, which no longer meets the priority habitat definition by 2015.

**T5**. Expansion
Re-establish 50 ha of grassland of wildlife value from arable or improved grassland, by 2010.

T5. New Target
37.5 ha (75%) of re-established area to be adjacent to existing Lowland Meadows or other semi-natural habitat by 2010. (Refer to T5)

T5. New Target
25 ha (50%) of re-established area to contribute to resultant habitat patches of 2 ha or more of Lowland Meadow by 2015. (Refer to T5)

The draft Welsh disaggregated Lowland Meadow HAP targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T3.** Achieve condition | **T4.** Restoration target | **T5**. Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 44 | 2.6 | 35 | 20 | 40 | 1 | 3 |
| **Snowdonia NP** | 64 | 3.8 | 50 | 30 | 59 | 2 | 3 |
| **Gwynedd** | 30 | 1.8 | 24 | 14 | 28 | 1 | 4 |
| **Conwy** | 6 | 0.4 | 5 | 3 | 6 | 0.2 | 5 |
| **Denbighshire** | 21 | 1.2 | 16 | 9 | 19 | 1 | 4 |
| **Flintshire** | 22 | 1.3 | 17 | 10 | 20 | 1 | 4 |
| **Wrexham** | 38 | 2.2 | 29 | 17 | 16 | 1 | 3 |
| **Powys** | 160 | 9.4 | 124 | 73 | 146 | 5 | 5 |
| **Ceredigion** | 150 | 8.8 | 116 | 68 | 124 | 4 | 3 |
| **Carmarthenshire** | 170 | 10 | 132 | 78 | 155 | 5 | 3 |
| **Pembrokeshire** | 510 | 30 | 397 | 233 | 466 | 15 | 1 |
| **Brecon Beacons NP** | 95 | 5.6 | 74 | 44 | 87 | 3 | 3 |
| **Swansea** | 27 | 1.6 | 21 | 12 | 25 | 1 | 4 |
| **Neath Port Talbot** | 72 | 4.2 | 56 | 33 | 65 | 2 | 3 |
| **Bridgend** | 28 | 1.6 | 21 | 12 | 249 | 1 | 4 |
| **Rhondda-Cynon-Taff** | 44 | 2.6 | 34 | 20 | 40 | 1 | 3 |
| **Merthyr Tydfil** | 10 | 0.6 | 8 | 5 | 9 | 0.3 | 4 |
| **Vale of Glamorgan** | 47 | 2.8 | 37 | 22 | 44 | 1 | 3 |
| **Cardiff** | 4 | 0.2 | 3 | 2 | 3 | 0.1 | 5 |
| **Caerphilly** | 11 | 0.6 | 8 | 5 | 9 | 0.3 | 5 |
| **Blaenau Gwent** | 0.7 | 0.04 | 1 | 0.5 | 1 | 0.02 | 5 |
| **Torfaen** | 10 | 0.6 | 8 | 5 | 9 | 0.3 | 5 |
| **Monmouthshire** | 120 | 7 | 93 | 54 | 109 | 4 | 2 |
| **Newport** | 6 | 0.4 | 5 | 3 | 6 | 0.2 | 5 |
| **Wales total** | **1700** | **99.3** | **1314** | **773** | **1735** | **50** | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

## H6 CALCAREOUS GRASSLANDS

### H6:1 LOWLAND CALCAREOUS GRASSLANDS

The 2006 Welsh Lowland Calcareous Grassland Targets are as follows:

**T1.** Maintenance Target
Maintain the current extent of Lowland Calcareous Grassland in the Wales. (Target represents no loss of BAP habitat).

T2.Achieving condition
Maintain at least the current condition of Lowland Calcareous Grassland.

**T3**. Achieving condition
Achieve favourable or recovering condition for 783 ha of Lowland Calcareous Grassland by 2015.

**T4**. Restoration
Restore 17 ha of Lowland Calcareous Grassland from semi-improved or neglected grassland, which no longer meets the priority habitat definition by 2015.

**T5.** Expansion
Re-establish 49 ha of grassland of wildlife value from arable or improved grassland by 2015.

T6. New Target
37 ha (75%) of re-established area to be adjacent to existing Lowland Calcareous Grassland or other semi-natural habitat by 2015. (Refer to T5)

T7. New Target
25 ha (50%) of re-established area to contribute to resultant habitat patches of 2 ha or more of Lowland Calcareous Grassland by 2015. (Refer to T5)

The draft Welsh disaggregated Lowland Calcareous Grassland HAP targets are:

| **Welsh LBAP areas** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T3.** Achieve condition | **T4.** Restoration target | **T5.** Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 86 | 7 | 80 | 54 | 1 | 3 | 2 |
| **Snowdonia NP** | 0.3 | <1 | 1 | 1 | 0 | 0 | 4 |
| **Conwy** | 240 | 22 | 252 | 171 | 4 | 11 | 1 |
| **Denbighshire** | 170 | 15 | 171 | 117 | 3 | 7 | 1 |
| **Flintshire** | 200 | 17 | 195 | 132 | 3 | 8 | 1 |
| **Wrexham** | 22 | 2 | 23 | 15 | 0.5 | 1 | 3 |
| **Powys** | 21 | 2 | 23 | 15 | 0.5 | 1 | 3 |
| **Carmarthenshire** | 3 | <1 | 3 | | 0 | 0 | 4 |
| **Pembrokeshire** | 17 | 1 | 11 | 7 | 0.2 | 0.5 | 2 |
| **Brecon Beacons NP** | 120 | 11 | 126 | 85 | 2 | 5 | 2 |
| **Swansea** | 82 | 7 | 80 | 54 | 1 | 3 | 2 |
| **Bridgend** | 32 | 3 | 34 | 23 | 0.5 | 1 | 3 |
| **Rhondda-Cynon-Taff** | 0.2 | <1 | 1 | 0 | 0 | 0 | 4 |
| **Merthyr Tydfil** | 28 | 3 | 34 | 23 | 0.5 | 1 | 3 |
| **Vale of Glamorgan** | 120 | 10 | 114 | 78 | 2 | 5 | 2 |
| **Cardiff** | 1 | <1 | 1 | 0 | 0 | 0 | 4 |
| **Caerphilly** | 9 | <1 | 9 | 0 | 0 | 0 | 4 |
| **Blaenau Gwent** | 4 | <1 | 1 | 0 | 0 | 0 | 4 |
| **Torfaen** | 1 | <1 | 1 | 0 | 0 | 0 | 4 |
| **Monmouthshire** | 12 | 1 | 11 | 8 | 0.2 | 0.5 | 4 |
| **Newport** | 2 | <1 | 2 | 0 | 0 | 0 | 4 |
| **Wales total** | **1200** | **100** | **1173** | **783** | **17** | **49** | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

## H6:2 UPLAND CALCAREOUS GRASSLANDS

The 2006 Welsh Upland Calcareous Grassland Targets are as follows:

**T1**. Maintenance Target

Maintain at least 700 ha of upland calcareous grassland in the Wales by 2015.

**T2**.Achieving condition

A total of X ha of upland calcareous grassland within A/SSSIs, in the UK, to be in favourable or unfavourable recovering condition by 2015.

T3. Restoration

Achieve a measurable increase in the extent of upland calcareous grassland outwith A/SSSIs in favourable or unfavourable recovering condition by 2015.

The draft Welsh disaggregated Upland Calcareous Grassland HAP targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2**. Achieve condition | **T3.** Restoration target | Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Snowdonia NP** | 56 | 9 | 63 | 24 | | | 1 |
| **Denbighshire** | 73 | 11 | 77 | 29 | | | 1 |
| **Wrexham** | 6 | <1 | 1 | 1 | | | 3 |
| **Powys** | 7 | 1 | 7 | 3 | | | 2 |
| **Brecon Beacons NP** | 470 | 72 | 504 | 192 | | | 1 |
| **Merthyr Tydfil** | 30 | 5 | 35 | 13 | | | 2 |
| **Caerphilly** | 0.7 | <1 | 1 | 1 | | | 3 |
| **Blaenau Gwent** | 11 | 2 | 14 | 5 | | | 3 |
| **Wales total** | **650** | **100** | **702** | **268** | | | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

**H7) ACID GRASSLAND**

## H7:1) LOWLAND DRY ACID GRASSLANDS

The 2006 Welsh Lowland Dry Acid Grassland Targets are as follows:

**T1.** Maintenance Target
Maintain the current extent of Lowland Dry Acid Grassland in the Wales, approximately 36.471 ha. (Target represents no loss of BAP habitat).

T2.Achieving condition
Maintain at least the current condition of Lowland Dry Acid Grassland.

**T3**. Achieving condition
Achieve favourable or recovering condition for 15,162 ha of Lowland Dry Acid Grassland by 2015.

**T4.** Restoration
Restore 54 ha of Lowland Dry Acid Grassland from semi-improved or neglected grassland, which no longer meets the priority habitat definition by 2015.

**T5.** Expansion
Re-establish 16 ha of grassland of wildlife value from arable or improved grassland by 2015.

T6. New Target type
12 ha (75%) of re-established area to be adjacent to existing Lowland Dry Acid Grassland or other semi-natural habitat by 2015. (Refer to T5)

T7. New Target type
8 ha (50%) of re-established area to contribute to resultant habitat patches of 6 ha or more of Lowland Dry Acid Grassland by 2015. (Refer to T5)

The draft Welsh disaggregated Lowland Dry Acid Grassland HAP targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T3.** Achieve condition | **T4.** Restoration target | **T5.** Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 410 | 1 | 365 | 152 | 1 | 0.2 | 4 |
| **Snowdonia NP** | 11,000 | 27 | 9848 | 4093 | 15 | 4 | 1 |
| **Gwynedd** | 4800 | 12 | 4377 | 1819 | 7 | 2 | 2 |
| **Conwy** | 1100 | 3 | 1094 | 455 | 2 | 0.5 | 3 |
| **Denbighshire** | 1100 | 3 | 1094 | 455 | 2 | 0.5 | 3 |
| **Flintshire** | 300 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| **Wrexham** | 540 | 1 | 365 | 152 | 0.5 | 0.2 | 3 |
| **Powys** | 5600 | 14 | 5106 | 2122 | 8 | 2 | 1 |
| **Ceredigion** | 2800 | 7 | 2553 | 1061 | 4 | 1 | 1 |
| **Carmarthenshire** | 1800 | 5 | 1824 | 758 | 3 | 1 | 3 |
| **Pembrokeshire** | 710 | 2 | 729 | 303 | 1 | 0.3 | 3 |
| **Brecon Beacons NP** | 2300 | 6 | 2188 | 910 | 3 | 1 | 2 |
| **Swansea** | 500 | 1 | 365 | 152 | 0.5 | 0.2 | 4 |
| **Neath Port Talbot** | 2000 | 5 | 1824 | 758 | 3 | 1 | 3 |
| **Bridgend** | 370 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| **Rhondda-Cynon-Taff** | 1400 | 4 | 1459 | 606 | 2 | 0.6 | 3 |
| **Merthyr Tydfil** | 500 | 1 | 365 | 152 | 0.5 | 0.2 | 4 |
| **Vale of Glamorgan** | 68 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| **Cardiff** | 6 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| **Caerphilly** | 860 | 2 | 729 | 303 | 1 | 0.3 | 3 |
| **Blaenau Gwent** | 820 | 2 | 729 | 303 | 1 | 0.3 | 3 |
| **Torfaen** | 410 | 1 | 365 | 152 | 0.5 | 0.2 | 3 |
| **Monmouthshire** | 75 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| **Newport** | 31 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| **Wales total** | **39,700** | **100** | **36471** | **15162** | **57** | **16** | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

## H8) DWARF SHRUB HEATH

### H8:1) LOWLAND HEATHLAND

The 2006 Welsh Lowland Heathland HAP Targets are as follows:

**T1.** Maintenance Target
Maintain the current extent of all existing lowland heathland. This target represents no net loss of habitat.

**T2.** Achieving condition Target
Maintain the area of lowland heathland currently in favourable condition.

**T3**. Achieving condition Target
Improve the condition of lowland heathland on sites currently in unfavourable condition.

**T4**. Restoration Target
Increase the extent of lowland heathland by 7,600 ha by 2015.

**T5.** New Target Type
Increase the number of heathland patches over 30 ha from 10% of the total resource to 50% by 2030.

The draft Welsh disaggregated Lowland Heathland HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1**. Maintenance target | **T2.** Achieve condition | **T3**. Restoration target | **T4.** Expansion target | **Proposed Priority LBAP area** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 840 | 7 | 875 | 259 | 0 | 70 | 1 |
| **Snowdonia NP** | 3000 | 24 | 3000 | 887 | 0 | 240 | 1 |
| **Gwynedd** | 1400 | 11 | 1375 | 407 | 0 | 110 | 1 |
| **Conwy** | 590 | 5 | 625 | 185 | 0 | 50 | 2 |
| **Denbighshire** | 410 | 3 | 375 | 111 | 0 | 30 | 1 |
| **Flintshire** | 160 | 1 | 125 | 37 | 0 | 10 | 2 |
| **Wrexham** | 62 | <1 | 62 | 18 | 0 | 5 | 2 |
| **Powys** | 810 | 6 | 750 | 222 | 0 | 60 | 1 |
| **Ceredigion** | 820 | 7 | 875 | 259 | 0 | 70 | 1 |
| **Carmarthenshire** | 400 | 3 | 375 | 111 | 0 | 30 | 2 |
| **Pembrokeshire** | 1200 | 10 | 1250 | 370 | 0 | 100 | 1 |
| **Brecon Beacons NP** | 410 | 3 | 375 | 111 | 0 | 30 | 2 |
| **Swansea** | 900 | 7 | 875 | 259 | 0 | 70 | 2 |
| **Neath Port Talbot** | 250 | 2 | 250 | 74 | 0 | 20 | 3 |
| **Bridgend** | 160 | 1 | 125 | 37 | 0 | 10 | 3 |
| **Rhondda-Cynon-Taff** | 480 | 4 | 500 | 148 | 0 | 40 | 2 |
| **Merthyr Tydfil** | 160 | 1 | 125 | 37 | 0 | 10 | 3 |
| **Vale of Glamorgan** | 45 | <1 | 62 | 18 | 0 | 5 | 2 |
| **Cardiff** | 0.5 | <1 | 62 | 18 | 0 | 5 | 3 |
| **Caerphilly** | 180 | 1 | 125 | 37 | 0 | 10 | 2 |
| **Blaenau Gwent** | 160 | 1 | 125 | 37 | 0 | 10 | 2 |
| **Torfaen** | 120 | <1 | 62 | 18 | 0 | 5 | 2 |
| **Monmouthshire** | 17 | <1 | 62 | 18 | 0 | 5 | 3 |
| **Newport** | 0.2 | <1 | 62 | 18 | 0 | 5 | 3 |
| **Wales total** | **12,500** | **100** | **12497** | **3696** | **0** | **1000** | |

## H8:2) UPLAND HEATHLAND

The 2006 Welsh Upland Heathland HAP Targets are as follows:

**T1.** Maintenance Target
Maintain at least 80,000 ha of upland heathland in the Wales by 2010.

**T2.** Achieving condition Target
A total of 34,200 ha of upland heathland, within SSSIs, in the UK to be in favourable or unfavourable recovering condition by 2015.

**T3**. Achieving condition Target
Achieve a measurable increase in the extent of upland heathland outwith SSSIs in favourable or unfavourable recovering condition by 2015.

The draft Welsh disaggregated Upland Heathland HAP Targets are:

| **Welsh LBAP Area** | **Area (PHW)** | **% Welsh resource** | **T1**. Maintenance target | **T2/T3** Achieve condition | Restoration target | Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Snowdonia NP** | 26,900 | 34 | 27200 | 11628 | | | 1 |
| **Gwynedd** | 2200 | 3 | 2400 | 1026 | | | 1 |
| **Conwy** | 1700 | 2 | 1600 | 684 | | | 1 |
| **Denbighshire** | 5500 | 7 | 5600 | 2394 | | | 1 |
| **Flintshire** | 230 | <1 | 533 | 228 | | | 3 |
| **Wrexham** | 2200 | 3 | 2400 | 1026 | | | 2 |
| **Powys** | 13,300 | 17 | 13600 | 5814 | | | 1 |
| **Ceredigion** | 3500 | 4 | 3200 | 1368 | | | 1 |
| **Carmarthenshire** | 2500 | 3 | 2400 | 1026 | | | 2 |
| **Pembrokeshire** | 2500 | 3 | 2400 | 1026 | | | 2 |
| **Brecon Beacons NP** | 11,800 | 15 | 12000 | 5130 | | | 1 |
| **Swansea** | 580 | <1 | 533 | 228 | | | 3 |
| **Neath Port Talbot** | 650 | <1 | 533 | 228 | | | 2 |
| **Bridgend** | 510 | <1 | 533 | 228 | | | 3 |
| **Rhondda-Cynon-Taff** | 980 | 1 | 800 | 342 | | | 2 |
| **Merthyr Tydfil** | 450 | <1 | 533 | 228 | | | 3 |
| **Cardiff** | 2 | <1 | 533 | 228 | | | 3 |
| **Caerphilly** | 1000 | 1 | 800 | 342 | | | 3 |
| **Blaenau Gwent** | 1400 | 2 | 1600 | 684 | | | 2 |
| **Torfaen** | 970 | 1 | 800 | 342 | | | 3 |
| **Wales total** | **79,000** | **100** | **79998** | **34200** | | | |

## H9) FEN, MARSH, AND SWAMP

## H9:1) UPLAND FLUSHES, FENS AND SWAMPS Ω

## H9:2) LOWLAND FEN

The 2006 Welsh Lowland Fen HAP Targets are as follows:

**T1.** Maintenance Target
Maintain the current extent of Welsh fen resource, approximately 6195 ha and diversity of fen types (see fen types 1-8). This target represents a "no loss" of habitat.

**T2.** Achieving condition
Maintain condition of 2895 ha of fen habitat where already favourable and establish by 2015, management to secure favourable condition for all areas of fen currently judged as unfavourable. The target condition for all such areas should be favourable or unfavourable recovering by 2020.

**T3**. Restoration
Initiate by 2015, the restoration of 53 ha of former fen habitat across Wales.

**T4.** New Target Type
Establish 8 new landscape scale wetland complexes by 2020, at least 1 in Wales in which fen is a major component along other wetland types and in which successional processes within the fen are allowed to proceed unchecked. This cross-refers to targets in the uplands, lowland raised bog, wet woodlands and reedbed HAPs. (Contributes to T3)

The draft Welsh disaggregated Lowland Fen HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2.** Achieve condition | **T3.** Restoration target | Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 520 | 8 | 496 | 232 | 4 | | 1 |
| **Snowdonia NP** | 1400 | 23 | 1426 | 667 | 12 | | 2 |
| **Gwynedd** | 610 | 10 | 620 | 290 | 5 | | 1 |
| **Conwy** | 300 | 5 | 310 | 145 | 3 | | 2 |
| **Denbighshire** | 71 | 1 | 62 | 29 | 0.5 | | 2 |
| **Flintshire** | 32 | <1 | 39 | 18 | 0.1 | | 2 |
| **Wrexham** | 41 | <1 | 39 | 18 | 0.1 | | 2 |
| **Powys** | 280 | 5 | 310 | 145 | 3 | | 2 |
| **Ceredigion** | 1200 | 19 | 1178 | 551 | 10 | | 1 |
| **Carmarthenshire** | 340 | 5 | 310 | 145 | 3 | | 2 |
| **Pembrokeshire** | 300 | 5 | 310 | 145 | 3 | | 1 |
| **Brecon Beacons NP** | 130 | 2 | 124 | 58 | 1 | | 2 |
| **Swansea** | 290 | 5 | 310 | 145 | 3 | | 1 |
| **Neath Port Talbot** | 210 | 3 | 186 | 87 | 2 | | 1 |
| **Bridgend** | 25 | <1 | 39 | 18 | 0.1 | | 3 |
| **Rhondda-Cynon-Taff** | 130 | 2 | 124 | 58 | 2 | | 3 |
| **Merthyr Tydfil** | 25 | <1 | 39 | 18 | 0.1 | | 3 |
| **Vale of Glamorgan** | 19 | <1 | 39 | 18 | 0.1 | | 2 |
| **Cardiff** | 5 | <1 | 39 | 18 | 0.1 | | 3 |
| **Caerphilly** | 32 | <1 | 39 | 18 | 0.1 | | 3 |
| **Blaenau Gwent** | 42 | <1 | 39 | 18 | 0.1 | | 3 |
| **Torfaen** | 12 | <1 | 39 | 18 | 0.1 | | 3 |
| **Monmouthshire** | 34 | <1 | 39 | 18 | 0.1 | | 2 |
| **Newport** | 37 | <1 | 39 | 18 | 0.1 | | 3 |
| **Wales total** | **6200** | **100** | **6195** | **2895** | **53** | | |

## H9:3) PURPLE MOORGRASS AND RUSH PASTURES

The 2006 Welsh Purple Moorgrass and Rush Pasture Targets are as follows:

**T1**. Maintenance Target
Maintain the current extent of Purple Moor-grass and Rush Pastures in the Wales, approximately 32,161 ha. (Target represents no loss of BAP habitat).

**T2**.Achieving condition
Maintain at least the current condition of Purple Moor-grass and Rush Pastures.

**T3**. Achieving condition
Achieve favourable or recovering condition for 15,644 ha of Purple Moor-grass and Rush Pasture by 2015.

**T4**. Restoration
Restore 440 ha of Purple Moor-grass and Rush Pasture from semi-improved or neglected grassland, which no longer meets the priority habitat definition by 2015.

**T5.** Expansion
Re-establish 43 ha of grassland of wildlife value from arable or improved grassland by 2015.

T6. New Target type
32 ha (75%) of re-established area to be adjacent to existing Purple Moor-grass and Rush Pastures or other semi-natural habitat by 2015. (Refer to T5)

T7. New Target type
22 ha (50%) of re-established area to contribute to resultant habitat patches of 2 ha or more of Purple Moor-grass and Rush Pasture by 2015. (Refer to T5)

The draft Welsh disaggregated Purple Moorgrass and Rush Pasture HAP targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance Target | **T3.** Achieve condition | **T4.** Restoration target | **T5.** Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 1400 | 4 | 1286 | 626 | 18 | 2 | 4 |
| **Snowdonia NP** | 3800 | 11 | 3538 | 1722 | 49 | 4 | 3 |
| **Gwynedd** | 3400 | 10 | 3216 | 1565 | 45 | 4 | 2 |
| **Conwy** | 350 | 1 | 322 | 157 | 5 | 0.4 | 4 |
| **Denbighshire** | 72 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Flintshire** | 50 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Wrexham** | 73 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Powys** | 3600 | 10 | 3216 | 1565 | 45 | 4 | 3 |
| **Ceredigion** | 4200 | 12 | 3859 | 1878 | 53 | 5 | 1 |
| **Carmarthenshire** | 6600 | 19 | 6111 | 2974 | 85 | 8 | 1 |
| **Pembrokeshire** | 3200 | 9 | 2894 | 1409 | 40 | 4 | 2 |
| **Brecon Beacons NP** | 2400 | 7 | 2251 | | 31 | 3 | 3 |
| **Swansea** | 1300 | 4 | 1286 | 626 | 18 | 2 | 1 |
| **Neath Port Talbot** | 1300 | 4 | 1286 | 626 | 18 | 2 | 1 |
| **Bridgend** | 660 | 2 | 643 | 313 | 9 | 1 | 2 |
| **Rhondda-Cynon-Taff** | 1500 | 4 | 1286 | 626 | 18 | 2 | 1 |
| **Merthyr Tydfil** | 260 | <1 | 65 | 140 | 0.1 | 0.1 | 1 |
| **Vale of Glamorgan** | 120 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Cardiff** | 46 | <1 | | 140 | 0.1 | 0.1 | 5 |
| **Caerphilly** | 500 | 1 | 322 | 157 | 5 | 0.4 | 4 |
| **Blaenau Gwent** | 160 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Torfaen** | 110 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Monmouthshire** | 79 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Newport** | 45 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| **Wales total** | **34,700** | **100** | **32101** | **15644** | **440** | **43** | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

## H9:4) REEDBED

The 2006 Welsh Reedbed HAP Targets are as follows:

**T1.** Maintenance Target

Maintain the extent of the existing resource of 465 ha of reedbed habitat by active management and with no net loss (priority will be to maintain blocks of greater than 2ha, where appropriate). Links to Bittern SAP.

**T2.** Achieving condition Target

Maintain the condition of 278 ha of wet reedbed habitat where already favourable and establish by 2015, management to secure favourable condition for all areas of targeted reedbed currently judged as unfavourable. The target condition for all such areas should be favourable or unfavourable recovering by 2020.

**T3**. Expansion Target

Continue creating reedbed from land of low nature conservation interest with the objective of expanding the BAP resource by 26 ha across the UK by 2015.

**T4.** New Target Type

Establish 8 new landscape scale wetland complexes by 2020, at least 1 in Wales in which fen is a major component along other wetland types and in which successional processes within the fen are allowed to proceed unchecked. This cross-refers to targets in the uplands, lowland raised bog, wet woodlands and reedbed HAPs. (Contributes to T3)

The draft Welsh disaggregated Reedbed HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2.** Achieve condition | Restoration target | **T3.** Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 100 | 22 | 101 | 60 | | 6 | 1 |
| **Snowdonia NP** | 23 | 5 | 23 | 14 | | 1 | 2 |
| **Gwynedd** | 35 | 8 | 36 | 22 | | 2 | 2 |
| **Conwy** | 28 | 6 | 28 | 16 | | 2 | 1 |
| **Denbighshire** | 0.5 | <1 | 1 | 1 | | | 2 |
| **Flintshire** | 4 | 1 | 5 | 2 | | 0.3 | 2 |
| **Powys** | 4 | 1 | 5 | 2 | | 0.3 | 3 |
| **Ceredigion** | 23 | 5 | 23 | 14 | | 1 | 2 |
| **Carmarthenshire** | 66 | 14 | 64 | 39 | | 4 | 1 |
| **Pembrokeshire** | 73 | 16 | 73 | 44 | | 4 | 1 |
| **Brecon Beacons NP** | 7 | 2 | 9 | 5 | | 0.5 | 3 |
| **Swansea** | 61 | 13 | 60 | 36 | | 3 | 2 |
| **Neath Port Talbot** | 12 | 3 | 14 | 8 | | 1 | 2 |
| **Bridgend** | 4 | 1 | 5 | 2 | | 0.3 | 3 |
| **Rhondda-Cynon-Taff** | 0.8 | <1 | 1 | 1 | | <0.25 | 3 |
| **Vale of Glamorgan** | 4 | 1 | 5 | 2 | | 0.3 | 3 |
| **Cardiff** | 0.5 | <1 | 1 | 1 | | <0.25 | 2 |
| **Caerphilly** | 2 | <1 | 1 | 1 | | <0.25 | 3 |
| **Monmouthshire** | 0.3 | <1 | 1 | 1 | | <0.25 | 3 |
| **Newport** | 8 | 2 | 9 | 5 | | 0.5 | 1 |
| **Wales total** | **460** | **100** | **465** | **276** | | **26** | |

## H10) BOG

### H10:1) LOWLAND RAISED BOG

The 2006 Welsh Lowland Raised Bog HAP Targets are as follows:

**T1.** Maintenance Target

Maintain the extent of the existing Wales resource of BAP habitat, approximately 1829 ha. (i.e. primary and secondary raised bog resource) with no loss.

**T2.** Achieving condition

Rehabilitate degraded bog habitat still capable of natural regeneration (in targeted areas) to bring most of the primary and secondary resource into or approaching favourable condition by 2015 through appropriate management.

**T3**. Restoration

Restore Lowland Raised Bog immediately or via succession from fen on chosen areas of archaic peat to ensure a sustainable hydrological regime for adjacent extant habitat and to restore LRB to its former geographical range as part of a national series.

T4. New Target Type

90% of the total market for soil improver and growing media to be peat free in the UK by 2010.

The draft Welsh disaggregated Lowland Raised Bog HAP targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2.** Achieve condition | **T3.** Restoration target | Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Conwy#** | | | | | | | 2 |
| **Snowdonia NP** | 94 | 5 | 92 | 68 | 4 | | 1 |
| **Wrexham** | 420 | 23 | 421 | 311 | 17 | | 1 |
| **Powys** | 53 | 3 | 55 | 41 | 2 | | 1 |
| **Ceredigion** | 1120 | 61 | 1116 | 825 | 46 | | 1 |
| **Carmarthenshire** | 49 | 3 | 55 | 41 | 2 | | 1 |
| **Pembrokeshire** | 13 | <1 | 18 | 13 | 1 | | 1 |
| **Brecon Beacons NP** | 16 | <1 | 18 | 13 | 1 | | 2 |
| **Neath Port Talbot#** | | | 12 | | | | |
| **Rhondda-Cynon-Taff** | 9 | <1 | 18 | 13 | 1 | | 2 |
| **Vale of Glamorgan** | 19 | 1 | 18 | 14 | 1 | | 3 |
| **Caerphilly** | 1.6 | <1 | 18 | 13 | 1 | | 3 |
| **Wales total** | **1830** | **96** | **1829** | **1352** | **76** | | |

# Small lowland raised bogs recently found in Conwy and Neath Port Talbot.

## H10:2 BLANKET BOG

The 2006 Welsh Blanket Bog HAP Targets are as follows:

**T1.** Maintenance Target
Maintain at least 69,896 ha of blanket mire in the Wales by 2015.

**T2.** Achieving condition
A total of 21,848 ha of blanket bog, within SSSIs, in the Wales, to be in favourable or unfavourable recovering condition by 2015.

**T3**. Achieving condition
Achieve a measurable increase in the extent of blanket bog outwith SSSIs in favourable or unfavourable recovering condition by 2015.

The draft Welsh disaggregated Blanket Bog HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% un - modified** | **% Welsh resource** | **T1.** Maintenance target | **T2/T3** Achieve condition | Restoration target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Snowdonia NP** | 17,000 | 60 | 30 | 21000 | 6555 | | 1 |
| **Gwynedd** | 480 | 57 | <1 | 144 | 48 | | 1 |
| **Conwy** | 1900 | 37 | 3 | 2100 | 656 | | 1 |
| **Denbighshire** | 1300 | 71 | 3 | 2100 | 656 | | 2 |
| **Wrexham** | 970 | 88 | 2 | 1400 | 437 | | 3 |
| **Powys** | 18,800 | 34 | 33 | 23100 | 7211 | | 1 |
| **Ceredigion** | 8300 | 30 | 15 | 10500 | 3278 | | 1 |
| **Carmarthenshire** | 830 | 13 | 1 | 700 | 219 | | 2 |
| **Pembrokeshire** | 100 | 6 | <1 | 144 | 48 | | 3 |
| **Brecon Beacons NP** | 5300 | 20 | 9 | 6300 | 1967 | | 1 |
| **Swansea** | 42 | 0 | <1 | 144 | 48 | | 3 |
| **Neath Port Talbot** | 49 | 2 | <1 | 144 | 48 | | 3 |
| **Bridgend** | 53 | 85 | <1 | 144 | 48 | | 3 |
| **Rhondda-Cynon-Taff** | 850 | 7 | 2 | 1400 | 437 | | 2 |
| **Merthyr Tydfil** | 0.2 | 100 | <1 | 144 | 48 | | 2 |
| **Caerphilly** | 30 | 0 | <1 | 144 | 48 | | 3 |
| **Blaenau Gwent** | 160 | 17 | <1 | 144 | 48 | | 2 |
| **Torfaen** | 110 | 52 | <1 | 144 | 48 | | 3 |
| **Wales total** | **56,200** | **41** | **98** | **69,896** | **21,848** | | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

## H11) MONTANE HABITATS

### H11:1) MOUNTAIN HEATHS AND WILLOW SCRUB Ω

It is thought that the entire Welsh resource of this habitat type lies within designated site(s) within the Snowdonia National Park, Jones et al (2003)

## H12) RIVERS AND STREAMS

## H1:1) RIVERS Ω

## H13) STANDING OPEN WATER AND CANALS

## H13:1) OLIGOTROPHIC AND DYSTROPHIC LAKES Ω

## H13:2 PONDS Ω

Ponds are a new S42 habitat awaiting an agreed definition and therefore draft Welsh disaggregated Pond targets have not been prepared, but some information on interest is available in Jones et al (2003), and a provisional distribution of the known interest is provided below after Nicolet, P. et al (2007):

| Welsh LBAP area | % Welsh resource | Identified Important Pond Areas | Potentially Important Pond Areas | Possible Priority LBAP areas |
|---|---|---|---|---|
| **Anglesey** | ? | X | - | 1 |
| **Snowdonia NP** | ? | - | X | 2 |
| **Gwynedd** | ? | - | X | 2 |
| **Conwy** | ? | - | - | ? |
| **Denbighshire** | ? | X | - | 1 |
| **Flintshire** | ? | X | - | 1 |
| **Wrexham** | ? | X | - | 1 |
| **Powys** | ? | X | - | 1 |
| **Ceredigion** | ? | - | X | 2 |
| **Carmarthenshire** | ? | - | - | ? |
| **Pembrokeshire** | ? | X | - | 1 |
| **Brecon Beacons NP** | ? | X | - | 1 |
| **Swansea** | ? | X | - | 1 |
| **Neath Port Talbot** | ? | X | - | 1 |
| **Bridgend** | ? | X | - | 1 |
| **Rhondda-Cynon-Taff** | ? | X | - | 1 |
| **Merthyr Tydfil** | ? | X | - | 1 |
| **Vale of Glamorgan** | ? | X | - | 1 |
| **Cardiff** | ? | X | - | 1 |
| **Caerphilly** | ? | X | - | 1 |
| **Blaenau Gwent** | ? | - | - | ? |
| **Torfaen** | ? | - | - | ? |
| **Monmouthshire** | ? | - | - | ? |
| **Newport** | ? | - | - | ? |
| **Wales Total** | | - | - | |

LBAP areas identified as? solely due to lack of known pond survey data.

## H13:3) MESOTROPHIC LAKES

The 2006 UK Mesotrophic Lakes HAP Targets are as follows:

**T1.** Achieve Condition Target
Maintain the condition of all mesotrophic lakes of known conservation importance currently judged in good condition (Tier 1 sites).

**T2.** Achieve Condition Target
Achieve good condition by 2010 in 7 mesotrophic lakes of conservation importance that have been damaged by human activity (Tier 2 sites).

**T3.** Achieve Condition Target
Improve the condition by 2010 of a further 82 mesotrophic lakes of conservation importance that have been damaged by human activity (Tier 2 sites). The target condition for all such sites should be in good or recovering condition by 2030.

**T4**. Achieve Condition Target
Maintain the condition of remaining mesotrophic lakes of known conservation importance (Tier 2 sites).

**T5**. Achieve Condition Target
Prevent further deterioration in condition of the remaining mesotrophic lakes (Tier 3 sites).

**T6**. Restoration Target
Undertake restoration measures by 2010 on 5 sites which have become so degraded that they have lost some qualifying feature of a mesotrophic lake of conservation importance (e.g. presence of a BAP species).

Draft Welsh disaggregated Mesotrophic Lake HAP Targets have not been prepared, but some information is available in Jones et al (2003).

## H13:4) EUTROPHIC STANDING WATERS

The 2006 UK Eutrophic Standing Waters HAP Targets are as follows:

**T1.** Achieve Condition Target
Maintain the condition of all eutrophic standing waters of known conservation importance currently judged in good condition (Tier 1 sites).

**T2.** Achieve Condition Target
Achieve good condition by 2010 in 14 eutrophic standing waters of conservation importance that have been damaged by human activity (Tier 2 sites).

**T3.** Achieve Condition Target
Improve the condition by 2010 of a further 206 eutrophic standing waters of conservation importance that have been damaged by human activity (Tier 2 sites). The target condition for all such sites should be in good or recovering condition by 2030.

**T4**. Achieve Condition Target
Maintain the condition of remaining eutrophic standing waters of known conservation importance (Tier 2 sites).

**T5**. Achieve Condition Target
Prevent further deterioration in condition of the remaining eutrophic standing waters (Tier 3 sites).

**T6**. Restoration Target
Undertake restoration measures by 2010 on 4 sites which have become so degraded that they have lost some qualifying feature of a eutrophic standing water of conservation importance (e.g. presence of a BAP species).

Draft Welsh disaggregated Eutrophic Standing Waters Targets have not been prepared, but some information is available in Jones et al (2003).

## H13:5) AQUIFER FED NATURALLY FLUCTUATING WATER BODIES

There is only one known Aquifer fed Naturally Fluctuating Water Body in Wales which is situated within a notified SSSI in Carmarthenshire, Jones et al (2003).

## H14) INLAND ROCK

## H14:1) INLAND ROCK OUTCROP AND SCREE HABITATS Ω

## H14:2) CALAMINARIAN GRASSLANDS Ω

Calaminarian Grasslands are a new S42 habitat awaiting an agreed definition and therefore draft Welsh disaggregated targets have not been prepared, but some information on interest is available in Common Standards Monitoring Guidance on the JNCC website.

## H14:3) OPEN MOSAIC HABITATS ON PREVIOUSLY DEVELOPED LAND Ω

## H14:4) LIMESTONE PAVEMENTS

The 2006 UK Limestone Pavement HAP Targets are as follows:

**T1.** Maintenance Target
Ensure that there is no loss to the extent of limestone pavement in the UK.

**T2.** Achieve Condition Target
Ensure there is no further deterioration in the quality of geodiversity of limestone pavement by 2010.

**T3.** Achieve Condition Target
Ensure there is no further deterioration in the quality of biodiversity of limestone pavement by 2010.

**T4**. Restoration Target
Undertake restoration measures by 2010 on 5 sites which have become so degraded that they have lost some qualifying feature of a mesotrophic lake of conservation importance (e.g. presence of a BAP species).

Draft Welsh disaggregated Limestone Pavement HAP Targets have not been prepared, but some information is available in Jones et al (2003), as below, together with provisional priority LBAP areas.

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2.** Achieve condition | **T3.** Achieve condition | **T4.** Restoration target | **Proposed Priority LBAP area** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 1 | 2 | 1 | 1 | 1 | 0 | 2 |
| **Conwy** | 3 | 5 | 3 | 3 | 3 | 0 | 2 |
| **Denbighshire** | 6 | 11 | 6 | 6 | 6 | 0 | 2 |
| **Wrexham** | 0.8 | 1 | 0.8 | 0.8 | 0.8 | 0 | 2 |
| **Pembrokeshire** | P | | | | | | |
| **Carmarthenshire** | P | | | | | | |
| **Brecon Beacons NP** | 42 | 78 | 42 | 42 | 42 | 0 | 1 |
| **Bridgend** | 0.1 | <1 | 0.1 | 0.1 | 0.1 | 0 | 3 |
| **Merthyr Tydfil** | 1 | 2 | 1 | 1 | 1 | 0 | 2 |
| **Wales total** | **54** | | **54** | **54** | **54** | **0** | |

## H15) COASTAL HABITATS

### H15:1 MARITIME CLIFFS AND SLOPES

The 2006 Welsh Maritime Cliffs and Slope HAP Targets are as follows:

**T1.** Maintenance Target
Maintain the existing free-functioning maritime cliff & slope resource (including of cliff-top and slope habitat), estimated to be have a length of about 4500 km. This is essentially a 'no net loss' target that should take account of the balance between the extent of coast protection works and free-functioning cliff systems.

**T2.** Maintenance Target
No overall net loss of cliff and slope functionality as a result of coast protection or engineering works.

T3. Restoration Target – ENGLAND only

**T4**. Expansion
Increase the area of cliff-top semi-natural habitats by at least 500 ha (minimum) by 2015.

**T5.** Achieving condition
Achieve favourable or recovering condition for 1,500 km/30% of maritime cliff and slope including cliff-top vegetation, by 2010.

The draft Welsh disaggregated Maritime Cliffs and Slope HAP Targets are:

| Welsh LBAP area | Length (km) (PHW) | % Welsh resource | T1. /T2. Maintenance target (km) | T5. Achieve condition (km) | Total area of habitat (ha) | % Welsh resource | T4. Expansion target (ha) | Proposed Priority LBAP areas |
|---|---|---|---|---|---|---|---|---|
| **Anglesey** | 129 | 21 | 129 | 78 | 570 | 16 | 8 | 1 |
| **Snowdonia NP** | See Gwynedd | | | | 6 | <1 | 0.3 | 3 |
| **Gwynedd** | 107 | 17 | 107 | 63 | 820 | 23 | 12 | 2 |
| **Conwy** | 19.8 | 3 | 20 | 11 | 29 | <1 | 0.3 | 2 |
| **Flintshire** | 0 | 0 | | | 0 | 0 | | 3 |
| **Ceredigion** | 51.3 | 8 | 51 | 30 | 330 | 9 | 5 | 1 |
| **Carmarthenshire** | 8.3 | 1 | 8 | 4 | 50 | 1 | 0.5 | 3 |
| **Pembrokeshire** | 217.8 | 35 | 218 | 130 | 1400 | 38 | 19 | 1 |
| **Swansea** | 35.3 | 6 | 35 | 22 | 230 | 6 | 3 | 1 |
| **Neath Port Talbot** | 0 | 0 | | | 0.4 | <1 | 0.3 | 3 |
| **Bridgend** | 7.6 | 1 | 8 | 4 | 9 | <1 | 0.3 | 3 |
| **Vale of Glamorgan** | 41.9 | 7 | 42 | 26 | 69 | 2 | 1 | 1 |
| **Cardiff** | 0 | 0 | | | 0.7 | <1 | 0.3 | 3 |
| **Monmouthshire** | 1.3 | 0.2 | 1 | 0.7 | 44 | 1 | 0.5 | 3 |
| **Newport** | 0 | 0 | | | 29 | <1 | 0.3 | 3 |
| **Wales total** | **619.3** | **100** | **619** | **369** | **3500** | **100** | **51** | |

## H15:2 COASTAL SAND-DUNE

The 2006 Welsh Coastal Sand Dune HAP Targets are as follows:

**T1.** Maintenance Target

There should be no further net loss of the existing Wales sand dune resource, its distribution and range of habitat types of about 8,288 ha from further losses to anthropogenic factors, whether caused directly or indirectly (e.g. by flood risk management schemes affecting coastal processes). This is a 'no net loss' target to take account of the dynamic nature of sand dunes.

**T2.** Achieve Condition Target

Achieve favourable or recovering condition by appropriate management of XXha of coastal sand dune systems currently in unfavourable condition by 2015. This should achive the retention or enhancement of populations of BAP priority species associated with sand dunes.

**T3.** Achieve Condition Target

Control natural succession to scrub, woodland, bracken and other invasive non-native plants. A target value of X ha by 2015.

**T4**. Achieve Condition Target

Re-establish Atlantic dune woodland habitat to 2 sites by 2015 (applicable to Wales only).

**T5**. Restoration Target

Restore sand dune habitat lost or severely degraded as a result of to afforestation, agriculture and infrastructure. A target figure of 149 ha (minimum) to be reinstated to dune habitat by 2010 (to be reviewed as a result of the inventory development).

The draft Welsh disaggregated Coastal Sand Dune HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2.** Achieve condition | **T5.** Restoration target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|
| **Anglesey** | 1400 | 23 | 1863 | | 33 | 1 |
| **Snowdonia NP** | 800 | 13 | 1053 | | 19 | 1 |
| **Gwynedd** | 510 | 9 | 729 | | 13 | 2 |
| **Conwy** | 24 | <1 | 24 | | 1 | 2 |
| **Denbighshire** | 52 | <1 | 52 | | 1 | 2 |
| **Flintshire** | 49 | <1 | 49 | | 1 | 2 |
| **Ceredigion** | 120 | 2 | 162 | | 3 | 3 |
| **Carmarthenshire** | 1200 | 19 | 1539 | | 28 | 1 |
| **Pembrokeshire** | 560 | 9 | 729 | | 13 | 2 |
| **Swansea** | 480 | 8 | 648 | | 12 | 1 |
| **Neath Port Talbot** | 190 | 3 | 243 | | 4 | 2 |
| **Bridgend** | 850 | 14 | 1134 | | 20 | 1 |
| **Vale of Glamorgan** | 3 | <1 | 3 | | 1 | 3 |
| **Wales total** | **6200** | **100** | **8288** | | **149** | |

The difference in total habitat area in PHW and Targets Review is due to using 1km square data for PHW and digitised data for the Targets Review.

## H15:3 COASTAL VEGETATED SHINGLE

The 2006 Welsh Coastal Vegetated Shingle HAP Targets are as follows:

**T1.** Maintenance Target

Maintain total extent of coastal vegetated shingle habitat throughout the UK, and the structures, sediment and coastal processes that support them,, approximately 5800ha. This is a 'no net loss' target to take account of the dynamic nature of shingle. This includes the maintenance of transitions to other habitats landward and seaward.

**T2.** Achieve Condition Target

Achieve favourable or recovering condition by appropriate management of XXha of coastal vegetated shingle systems currently in unfavourable condition by 2010. This should achieve the retention or enhancement of populations of BAP priority species associated with vegetated shingle.

**T3**. Restoration Target

In key locations initiate restoration of shingle communities on arable land over shingle deposits by 2015.

The draft Welsh disaggregated Coastal Vegetated Shingle HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T2.** Achieve condition | **T3.** Restoration target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|
| **Anglesey** | 6 | 5.4 | 6 | | | 2 |
| **Gwynedd** | 58 | 53 | 58 | | | 1 |
| **Conwy** | 16 | 15 | 16 | | | 1 |
| **Denbighshire** | 2 | 2 | 2 | | | 3 |
| **Ceredigion** | 6 | 5.4 | 6 | | | 2 |
| **Carmarthenshire** | 0.5 | 0.5 | 0.5 | | | 3 |
| **Pembrokeshire** | 4 | 4 | 4 | | | 3 |
| **Swansea** | 4 | 4 | 4 | | | 2 |
| **Bridgend** | 0.5 | 0.5 | 0.5 | | | 3 |
| **Vale of Glamorgan** | 13 | 12 | 13 | | | 1 |
| **Wales total** | **110** | **102** | **110** | | | |

## MARINE HABITATS

## H17) LITTORAL ROCK

H17:1) INTERTIDAL BOULDER COMMUNITIES

H17:2) *SABELLARIA ALVEOLATA* REEFS

H17:3) ESTUARINE ROCKY HABITATS

## H18) LITTORAL SEDIMENT

## H18:1) COASTAL SALTMARSH

The 2006 Welsh Coastal Saltmarsh HAP Targets are as follows:

**T1.** Maintenance Target

There should be no further net loss of extent of intertidal sediment ecosystems, currently estimated at 600ha per year in England and Wales. This breaks down to: the vegetated part of the intertidal sediment ecosystems (saltmarsh), currently estimated at 100ha per year. The unvegetated part of the intertidal sediment ecosystems (mudflats), currently estimated at 500ha per year. (Cross-plan target with mudflats).

**T2.** Expansion Target

Create 360 ha of intertidal sediment habitat in Wales by the year 2015 to offset historical losses, which represents 10% of the England and Wales target. This breaks down to: 4 ha/year for vegetated intertidal sediment and 20 ha/year for unvegetated intertidal sediment. (Cross-plan target with mudflats).

**T3**. Achieve Condition Target

Achieve favourable or recovering condition by appropriate management of XX ha of intertidal sediment habitat currently in unfavourable condition by 2015. (Cross-plan target with mudflats).

The draft Welsh disaggregated Coastal Saltmarsh HAP Targets are:

| **Welsh LBAP area** | **Area (PHW)** | **% Welsh resource** | **T1.** Maintenance target | **T3.** Achieve condition | Restoration target | **T2.** Expansion target | **Proposed Priority LBAP areas** |
|---|---|---|---|---|---|---|---|
| **Anglesey** | 300 | 5 | | | | | |
| **Snowdonia NP** | 570 | 10 | | | | | |
| **Gwynedd** | 350 | 6 | | | | | |
| **Conwy** | 150 | 3 | | | | | |
| **Denbighshire** | 35 | <1 | | | | | |
| **Flintshire** | 710 | 12 | | | | | |
| **Powys** | 31 | <1 | | | | | |
| **Ceredigion** | 360 | 6 | | | | | |
| **Carmarthenshire** | 1200 | 21 | | | | | |
| **Pembrokeshire** | 260 | 5 | | | | | |
| **Swansea** | 1300 | 22 | | | | | |
| **Neath Port Talbot** | 200 | 3 | | | | | |
| **Bridgend** | 14 | <1 | | | | | |
| **Vale of Glamorgan** | 22 | <1 | | | | | |
| **Cardiff** | 34 | <1 | | | | | |
| **Monmouthshire** | 98 | 2 | | | | | |
| **Newport** | 130 | 2 | | | | | |
| **Wales total** | **5800** | **100** | **14320** | | | **360** | |

## H18:2) INTERTIDAL MUDFLATS TARGETS

The 2006 UK Intertidal Mudflats HAP Targets are as follows:

**T1.** Achieve Condition Target

There should be no further net loss of extent of intertidal sediment ecosystems [approximately 14,320 ha in Wales] currently estimated at 600ha per year. This breaks down to: the vegetated part of the intertidal sediment ecosystems (saltmarsh), currently estimated at 100ha per year. The unvegetated part of the intertidal sediment ecosystems (mudflats), currently estimated at 500ha per year. (Cross-plan target with coastal saltmarsh).

**T2.** Expansion Target

Create by the year 2015, 360 ha of intertidal sediment habitat in Wales to offset historical losses, 10% of the England and Wales target. This breaks down to: 4 ha/year for vegetated intertidal sediment and 20 ha/year for unvegetated intertidal sediment. (Cross-plan target with coastal saltmarsh).

**T3.** Achieve Condition Target

Achieve favourable or recovering condition by appropriate management of XX ha of intertidal sediment habitat currently in unfavourable condition by 2010. (Cross-plan target with coastal saltmarsh).

H18:3) SEA GRASS BEDS

H18:4) SHELTERED MUDDY GRAVELS

H18:5) PEAT AND CLAY EXPOSURES

## H19) SUBLITTORAL ROCK

H19:1) TIDE-SWEPT CHANNELS

H19:2) FRAGILE SPONGE AND ANTHOZOAN COMMUNITIES ON SUBTIDAL ROCKY HABITATS

H19:4) CARBONATE REEFS

## H20) SUBLITTORAL SEDIMENTS

H20:1) SUBTIDAL SANDS AND GRAVELS

H20:2) SUBLITTORAL MUDDY SEDIMENTS

H20:3) MUD HABITATS IN DEEP WATER

H20:4) MUSCULUS DISCORS BEDS, GREEN CRENELLA BEDS

H20:5) BLUE MUSSEL BEDS

H20:6) HORSE MUSSEL BEDS

H20:7) MAERL BEDS

**H26) SALINE LAGOONS TARGETS**

The 2006 UK Saline Lagoon HAP Targets are as follows:

**T1.** Maintenance Target

There should be no further net loss in the 39 ha extent of saline lagoons in Wales, subject to natural change. Any loss due to anthropogenic pressures should be offset with habitat enhancement / creation.

**T2.** Maintenance Target

Maintain (no reduction in) the current nine sites and distribution of coastal saline lagoons in Wales, subject to natural change.

**T3.** Achieve Condition Target

Achieve favourable or recovering condition for 35 ha of coastal saline lagoon resource in Wales by 2010, subject to natural processes (as measured by physico-chemical form and function and community and species diversity).

**T4**. Expansion Target

Create, by the year 2015, 13 ha of saline lagoon to offset estimated historical losses.

# APPENDIX 3

## Wales and UK Priority Habitat Targets disaggregated by LBAP partnership

The accompanying tables present an attempt to break down the new Welsh BAP habitat targets for each LBAP area, with additional information.

The underlying principle behind this exercise is that the value of the targets for maintenance, restoration, expansion and condition have been derived in direct proportion to the amount of the habitat present in each LBAP. This figure has been taken from Jones *et al*, (2003). However, for many of the habitats presented, the new baseline figure for the habitat used during the target review exercise differs, mostly only slightly, from that given in PHW. This may be due to an acknowledged decline in the habitat area during the intervening period between the Habitat Survey of Wales and the setting of Welsh targets (especially so for grasslands). Woodland figures are very different because the definition of what is included within the woodland HAP has been extended to include all native woodland. Additionally, further examination of the Welsh target by FC Wales, has shown that there is an overestimation of the amount of native woodland in the target review figures. An alternative, lower total habitat area is therefore given alongside the published figure in the accompanying table. Data on the amount of woodland habitat in each LBAP can only be derived from the Habitat Survey of Wales; it is assumed that the distribution is similarly spread across LBAPs for the higher baseline values of native woodland used in the examples.

Hedgerow and arable margin targets have been set for Wales, but as comprehensive data is not available at this time, figures for Welsh LBAPs have not been provided. Priority areas for hedgerow and arable action have been identified in the spreadsheet.

All figures in the tables have been rounded to the nearest number if less than 1 (>1). The LBAPs partnerships holding greater than 1% of the total resource are given an equal share of the target, despite their actual percentage contribution.

For several of present habitats, and all the new S42 habitats, the UK groups have not yet set the full range of targets for restoration, expansion or condition improvement. These are shown as blanks in the table. Once these figures become available, this appendix will be update. The full Wales or UK targets where appropriate can be seen in Appendix 2.

In all cases, the areas of habitat given on the tables should be used as an indication of the amount of habitat that would be required to meet the Welsh targets when summed over the whole of Wales. They are not meant to be prescriptive, just a guide to the relative amounts of restoration or expansion that need to be undertaken if we are to meet our targets. LBAP partnerships may decide to, or have the opportunity to do much more in some circumstances. CCW have tried to indicate the priority LBAP areas for action for each habitat on a scale of 1=highest and 5= lowest. Again these are indicative only and are not meant to reflect in any judgemental way on the habitat present in each LBAP area. [After Liz Howe, CCW.]

**ANGLESEY**

**[74,608 ha; of which 12% is the area of known priority habitat types]**

Anglesey **minimum** targets for some S42 habitats by 2015:-

| Anglesey LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 7 | 3.5 | 53 | 37 | 2 | 1 | 1 |
| *Native Woodland | 1000 | 1 | 1243 | 355 | 49 | 43 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 2100[1] | 4 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 2900 | 5 | 1993 | 897 | 225 | 5 | 1 |
| *Lowland Hay Meadow | 44 | 2.6 | 35 | 20 | 40 | 1 | 3 |
| *Lowland Calcareous Grassland | 86 | 7 | 80 | 54 | 1 | 3 | 2 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Dry Acid Grassland | 410 | 1 | 365 | 152 | 1 | 0.2 | 4 |
| *Lowland Heathland | 840 | 7 | 875 | 259 | 0 | 70 | 1 |
| *Upland Heathland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Fen | 520 | 8 | 496 | 232 | 4 | 0 | 1 |
| *Purple Moorgrass and Rush Pasture | 1400 | 4 | 1286 | 626 | 18 | 2 | 4 |
| *Wet Reedbed | 100 | 22 | 101 | 60 | 0 | 6 | 1 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Rivers | - | DD | ? | ? | ? | | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 2 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 1 | 2 | 1 | 1 | 1 | 0 | 2 |
| **Maritime Cliff and Slope | 129 | 21 | 129 | 78 | 0 | 570* | 1 |
| *Sand Dune | 1400 | 23 | 1863 | - | 33 | - | 1 |
| *Coastal Vegetated Shingle | 6 | 5.4 | 6 | 0 | 0 | 0 | 1 |
| *Saltmarsh | 300 | 5 | | | | | |
| ***Anglesey Totals** | **9,005** | | **8,343** | **2,655** | **371** | **130** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**SNOWDONIA NATIONAL PARK**

**[213,191 ha; of which 36% is the area of known priority habitat types]**

Snowdonia NP **minimum** targets for some S42 habitats by 2015:-

| Snowdonia National Park LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 8 | 4 | 60 | 42 | 2 | 1 | 2 |
| *Native Woodland | 8100 | 10 | 12,430 | 3553 | 491 | 426 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | - | 2 |
| *Arable Field Margins | 100[1] | <1 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 4200 | 8 | 3189 | 1435 | 360 | 8 | 1 |
| *Lowland Hay Meadow | 64 | 3.8 | 50 | 30 | 59 | 2 | 3 |
| *Lowland Dry Acid Grassland | 11,000 | 27 | 9848 | 4093 | 15 | 4 | 1 |
| *Lowland Calcareous Grassland | 0.3 | <1 | 1 | 1 | 0 | 0 | 4 |
| *Upland Calcareous Grassland | 56 | 9 | 63 | 24 | 0 | 0 | 1 |
| *Lowland Heathland | 3000 | 24 | 3000 | 887 | 0 | 240 | 1 |
| *Upland Heathland | 26,900 | 34 | 27200 | 11628 | | | 1 |
| Upland Fens Flushes and Swamps | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 1400 | 23 | 1426 | 667 | 12 | 0 | 2 |
| *Purple Moorgrass and Rush Pasture | 3800 | 11 | 3538 | 1722 | 49 | 4 | 3 |
| *Reedbed | 23 | 5 | 23 | 14 | 0 | 1 | 2 |
| *Lowland Raised Bog | 94 | 5 | 92 | 68 | 4 | 0 | 1 |
| *Blanket Bog | 17,000 | 30 | 21000 | 6555 | 0 | 0 | 1 |
| Montane Heath and Willow Scrub | - | ? | ? | ? | ? | ? | ? |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | P |
| ***Mesotrophic Lakes | 6 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | see Gwynedd | | | | | 0.3* | 3 |
| *Sand Dune | 800 | 13 | 1053 | 0 | 19 | 0 | 1 |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 570 | 10 | | | | | ? |
| ***Snowdonia NP Totals** | **77,007** | | **82,913** | **30,677** | **1,009** | **685** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites; P = Potential

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**GWYNEDD**

**[90,997 ha; of which 22% is the area of known priority habitat types]**

Gwynedd **minimum** targets for some S42 habitats by 2015:-

| Gwynedd LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 8 | 4 | 60 | 42 | 2 | 1 | 2 |
| *Native Woodland | 2600 | 3 | 3729 | 1066 | 147 | 128 | 1 |
| **Hedgerows | - | ? | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 3000[1] | 3 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 3800 | 7 | 2790 | 1256 | 315 | 7 | 1 |
| *Lowland Hay Meadow | 30 | 1.8 | 24 | 14 | 28 | 1 | 4 |
| *Lowland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Dry Acid Grassland | 4800 | 12 | 4377 | 1819 | 7 | 2 | 2 |
| *Lowland Heathland | 1400 | 11 | 1375 | 407 | 0 | 110 | 1 |
| *Upland Heathland | 2200 | 3 | 2400 | 1026 | | | 1 |
| Upland Fens Flushes and Swamps | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 610 | 10 | 620 | 290 | 5 | 0 | 1 |
| *Purple Moorgrass and Rush Pasture | 3400 | 10 | 3216 | 1565 | 45 | 4 | 2 |
| *Reedbed | 35 | 8 | 36 | 22 | 0 | 2 | 2 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 480 | <1 | 144 | 48 | 0 | 0 | 1 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | P |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 107 | 17 | 107 | 63 | | 12* | 2 |
| *Sand Dune | 510 | 9 | 729 | | 13 | | 2 |
| *Coastal Vegetated Shingle | 58 | 53 | 58 | | | | 2 |
| *Saltmarsh | 350 | 6 | | | | | ? |
| ***Gwynedd Totals** | **20,273** | | **19,605** | **7,576** | **560** | **254** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites; P = Potential

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

## CONWY

**[72,222 ha; of which 15% is the area of known priority habitat types]**

Conwy **minimum** targets for some S42 habitats by 2015:-

| Conwy LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 10 | 5 | 75 | 53 | 3 | 1 | 2 |
| *Native Woodland | 2500 | 3 | 3285 | 1066 | 147 | 128 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 710[1] | 1 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 2000 | 4 | 1594 | 717 | 180 | 4 | 1 |
| *Lowland Hay Meadow | 6 | 0.4 | 5 | 3 | 6 | 0.2 | 5 |
| *Lowland Calcareous Grassland | 240 | 22 | 252 | 171 | 4 | 11 | 1 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Dry Acid Grassland | 1100 | 3 | 1094 | 455 | 2 | 0.5 | 3 |
| *Lowland Heathland | 590 | 5 | 625 | 185 | 0 | 50 | 2 |
| *Upland Heathland | 1700 | 2 | 1600 | 684 | 0 | 0 | 1 |
| Upland Fens Flushes and Swamps | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 300 | 5 | 310 | 145 | 3 | 0 | 2 |
| *Purple Moorgrass and Rush Pasture | 350 | 1 | 322 | 157 | 5 | 0.4 | 4 |
| *Reedbed | 28 | 6 | 28 | 16 | 0 | 2 | 1 |
| *Lowland Raised Bog | # | ? | ? | ? | ? | ? | ? |
| *Blanket Bog | 1900 | 3 | 2100 | 656 | 0 | 0 | 1 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | ? |
| ***Mesotrophic Lakes | 3 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 3 | 5 | 3 | 3 | 3 | 0 | 2 |
| **Maritime Cliff and Slope | 19.8 | 3 | 20 | 11 | 0 | 0.3* | 2 |
| *Sand Dune | 24 | <1 | 24 | 0 | 1 | 0 | 2 |
| *Coastal Vegetated Shingle | 16 | 15 | 16 | 0 | 0 | 0 | 1 |
| *Saltmarsh | 150 | 3 | | | | | |
| ***Conwy Totals** | **10,907** | | **11,258** | **4,258** | **350** | **196** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites; ? = Unknown

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

# small raised bog recently ( 2006) found in Conwy

DD data deficient

**DENBIGHSHIRE**

**[84,880 ha; of which 17% is the area of known priority habitat types]**

Denbighshire **minimum** targets for some S42 habitats by 2015:-

| Denbighshire LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 23 | 11 | 165 | 116 | 7 | 0 | 1 |
| *Native Woodland | 2500 | 3 | 3729 | 1066 | 147 | 128 | 1 |
| **Hedgerows | - | ? | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 2400[1] | 4 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 3500 | 6 | 2391 | 1076 | 270 | 6 | 1 |
| *Lowland Hay Meadow | 21 | 1.2 | 16 | 9 | 19 | 1 | 4 |
| *Lowland Dry Acid Grassland | 1100 | 3 | 1094 | 455 | 2 | 0.5 | 3 |
| *Lowland Calcareous Grassland | 170 | 15 | 171 | 117 | 3 | 7 | 1 |
| *Upland Calcareous Grassland | 73 | 11 | 77 | 29 | 0 | 0 | 1 |
| *Lowland Heathland | 410 | 3 | 375 | 111 | | 30 | 1 |
| *Upland Heathland | 5500 | 7 | 5600 | 2394 | | | 1 |
| Upland Fens Flushes and Swamps | ? | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 71 | 1 | 62 | 29 | 0.5 | | 2 |
| *Purple Moorgrass and Rush Pasture | 72 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 0.5 | <1 | 1 | 1 | 0 | 0 | 2 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 1300 | 3 | 2100 | 656 | 0 | 0 | 2 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 6 | 11 | 6 | 6 | 6 | | 2 |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 52 | <1 | 52 | | 1 | | 2 |
| *Coastal Vegetated Shingle | 2 | 2 | 2 | | | 0 | 3 |
| *Saltmarsh | 35 | <1 | | | | | ? |
| ***Denbighshire Totals** | **14,777** | | **15,741** | **6,089** | **449** | **173** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**FLINTSHIRE**

**[48,788 ha; of which 11% is the area of known priority habitat types]**

Flintshire **minimum** targets for some S42 habitats by 2015:-

| Flintshire LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 10 | 5 | 75 | 53 | 3 | 1 | 2 |
| *Native Woodland | 1800 | 2 | 2486 | 710 | 98 | 85 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 2900[1] | 5 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 2500 | 5 | 1993 | 897 | 225 | 5 | 1 |
| *Lowland Hay Meadow | 22 | 1.3 | 17 | 10 | 20 | 1 | 4 |
| *Lowland Calcareous Grassland | 200 | 17 | 195 | 132 | 3 | 8 | 1 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Dry Acid Grassland | 300 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| *Lowland Heathland | 160 | 1 | 125 | 37 | | 10 | 2 |
| *Upland Heathland | 230 | <1 | 533 | 228 | | | 3 |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 32 | <1 | 39 | 18 | 0.1 | | 2 |
| *Purple Moorgrass and Rush Pasture | 50 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 4 | 1 | 5 | 2 | 0 | 0.3 | 2 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 49 | <1 | 49 | | 1 | | 2 |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 710 | 12 | | | | | |
| ***Flintshire Totals** | **5,347** | | **5,689** | **2,250** | **348** | **110** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**WREXHAM**

**[49,680 ha; of which 16% is the area of known priority habitat types]**

Wrexham **minimum** targets for some S42 habitats by 2015:-

| Wrexham LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 12 | 6 | 90 | 63 | 4 | 1 | 1 |
| *Native Woodland | 1300 | 2 | 2486 | 710 | 98 | 85 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 3500[1] | 6 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 2400 | 4 | 1594 | 717 | 180 | 4 | 2 |
| *Lowland Hay Meadow | 38 | 2.2 | 29 | 17 | 16 | 1 | 3 |
| *Lowland Dry Acid Grassland | 540 | 1 | 365 | 152 | 0.5 | 0.2 | 3 |
| *Lowland Calcareous Grassland | 22 | 2 | 23 | 15 | 0.5 | 1 | 3 |
| *Upland Calcareous Grassland | 6 | <1 | 1 | 1 | | | 3 |
| *Lowland Heathland | 62 | <1 | 62 | 18 | | 5 | 2 |
| *Upland Heathland | 2200 | 3 | 2400 | 1026 | | | 2 |
| *Lowland Fen | 41 | <1 | 39 | 18 | 0.1 | | 2 |
| *Purple Moorgrass and Rush Pasture | 73 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Raised Bog | 420 | 23 | 421 | 311 | 17 | 0 | 1 |
| *Blanket Bog | 970 | 2 | 1400 | 437 | 0 | 0 | 3 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0.8 | 1 | 0.8 | 0.8 | 0.8 | 0 | 2 |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| ***Wrexham Totals** | **8,073** | | **8,886** | **3,563** | **313** | **96** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**POWYS**

**[428781 ha; of which 16% is the area of known priority habitat types]**

Powys **minimum** targets for some S42 habitats by 2015:-

| Powys LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 43 | 21 | 315 | 221 | 13 | 4 | 1 |
| *Native Woodland | 16700 | 20 | 24860 | 7106 | 982 | 853 | 1 |
| **Hedgerows | 9100 | 19 | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 8600[1] | 14 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 9300 | 17 | 6776 | 3049 | 765 | 17 | 1 |
| *Lowland Hay Meadow | 160 | 9.4 | 124 | 73 | 146 | 5 | 5 |
| *Lowland Dry Acid Grassland | 5600 | 14 | 5106 | 2122 | 8 | 2 | 1 |
| *Lowland Calcareous Grassland | 21 | 2 | 23 | 15 | 0.5 | 1 | 3 |
| *Upland Calcareous Grassland | 7 | 1 | 7 | 3 | | | 2 |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | ? |
| *Lowland Heathland | 810 | 6 | 750 | 222 | | 60 | 1 |
| *Upland Heathland | 13300 | 17 | 13600 | 5814 | | | 1 |
| *Lowland Fen | 280 | 5 | 310 | 145 | 3 | | 2 |
| *Purple Moorgrass and Rush Pasture | 3600 | 10 | 3216 | 1565 | 45 | 4 | 3 |
| *Reedbed | 4 | 1 | 5 | 2 | | 0.3 | 3 |
| *Lowland Raised Bog | 53 | 3 | 55 | 41 | 2 | | 1 |
| *Blanket Bog | 18800 | 33 | 23100 | 7211 | | | 1 |
| **Rivers | - | DD | ? | ? | ? | - | 1 |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 3 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 31 | <1 | | | | | ? |
| ***Powys Totals** | **68,635** | | **77,932** | **27,368** | **1,951** | **942** | - |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**CEREDIGION**

**[180587 ha; of which 20% is the area of known priority habitat types]**

Ceredigion **minimum** targets for some S42 habitats by 2015:-

| Ceredigion LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 14 | 7 | 105 | 74 | 4 | 1 | 1 |
| *Native Woodland | 5700 | 7 | 8701 | 2487 | 344 | 298 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 2200[1] | 4 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 4700 | 9 | 3587 | 1614 | 405 | 9 | 1 |
| *Lowland Hay Meadow | 150 | 8.8 | 116 | 68 | 124 | 4 | 3 |
| *Lowland Dry Acid Grassland | 2800 | 7 | 2553 | 1061 | 4 | 1 | 1 |
| *Lowland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 820 | 7 | 875 | 259 | | 70 | 1 |
| *Upland Heathland | 3500 | 4 | 3200 | 1368 | | | 1 |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 1200 | 19 | 1178 | 551 | 10 | | 1 |
| *Purple Moorgrass and Rush Pasture | 4200 | 12 | 3859 | 1878 | 53 | 5 | 1 |
| *Reedbed | 23 | 5 | 23 | 14 | | 1 | 2 |
| *Lowland Raised Bog | 1120 | 61 | 1116 | 825 | 46 | 0 | 1 |
| *Blanket Bog | 8300 | 15 | 10500 | 3278 | | 0 | 1 |
| **Rivers | - | DD | ? | ? | ? | - | 1 |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | P |
| ***Mesotrophic Lakes | 5 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | 1 |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 51.3 | 8 | 51 | 30 | 0 | 5* | 1 |
| *Sand Dune | 120 | 2 | 162 | 0 | 3 | 0 | 3 |
| *Coastal Vegetated Shingle | 6 | 5.4 | 6 | 0 | 0 | 0 | 2 |
| *Saltmarsh | 360 | 6 | | | | | |
| ***Ceredigion Totals** | **32,639** | | **35,876** | **13,403** | **989** | **388** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites; P = Potential

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**CARMARTHENSHIRE**

**[222,826 ha; of which 15% is the area of known priority habitat types]**

Carmarthenshire **minimum** targets for some S42 habitats by 2015:-

| Carmarthenshire LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | **?** |
| ***[Wood Pasture and] Parkland[n] | 9 | 4.5 | 68 | 47 | 3 | 1 | **1** |
| *Native Woodland | 11,700 | 14 | 17402 | 4974 | 687 | 597 | **1** |
| **Hedgerows | - | DD | ? | ? | ? | ? | **1** |
| *Arable Field Margins | 2000[1] | 3 | ? | ? | ? | ? | **1** |
| *Coastal Floodplain and Grazing Marsh | 7500 | 14 | 5580 | 2511 | 630 | 14 | **1** |
| *Lowland Hay Meadow | 170 | 10 | 132 | 78 | 155 | 5 | **3** |
| *Lowland Dry Acid Grassland | 1800 | 5 | 1824 | 758 | 3 | 1 | **3** |
| *Lowland Calcareous Grassland | 3 | <1 | 3 | 0 | 0 | 0 | **4** |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | **-** |
| *Lowland Heathland | 400 | 3 | 375 | 111 | | 30 | **2** |
| *Upland Heathland | 2500 | 3 | 2400 | 1026 | | | **2** |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | **?** |
| *Lowland Fen | 340 | 5 | 310 | 145 | 3 | | **2** |
| *Purple Moorgrass and Rush Pasture | 6600 | 19 | 6111 | 2974 | 85 | 8 | **1** |
| *Reedbed | 66 | 14 | 64 | 39 | | 4 | **1** |
| *Lowland Raised Bog | 49 | 3 | 55 | 41 | 2 | 0 | **1** |
| *Blanket Bog | 830 | 1 | 700 | 219 | 0 | 0 | **2** |
| **Rivers | - | DD | ? | ? | ? | - | **1** |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | **?** |
| ***Ponds | - | DD | ? | ? | ? | ? | **?** |
| ***Mesotrophic Lakes | - | DD | ? | ? | ? | ? | **?** |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | **?** |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | **?** |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | **?** |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | **?** |
| *Limestone Pavement | P | 0 | 0 | 0 | 0 | 0 | **0** |
| **Maritime Cliff and Slope | 8.3 | 1 | 8 | 4 | | 0.5* | **3** |
| *Sand Dune | 1200 | 19 | 1539 | 0 | 28 | 0 | **1** |
| *Coastal Vegetated Shingle | 0.5 | 0.5 | 0.5 | 0 | 0 | 0 | **3** |
| *Saltmarsh | 1200 | 21 | | | | | |
| ***Carmarthenshire Totals** | 33,167 | | 36,504 | 12,880 | 1,593 | 659 | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**PEMBROKESHIRE**

**[161458 ha; of which 10% is the area of known priority habitat types]**

Pembrokeshire **minimum** targets for some S42 habitats by 2015:-

| Pembrokeshire LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 6 | 3 | 45 | 32 | 2 | 1 | 3 |
| *Native Woodland | 6600 | 8 | 9944 | 2842 | 393 | 341 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 14000[1] | 24 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 1000 | 2 | 797 | 359 | 90 | 2 | 3 |
| *Lowland Hay Meadow | 510 | 30 | 397 | 233 | 466 | 15 | 1 |
| *Lowland Dry Acid Grassland | 710 | 2 | 729 | 303 | 1 | 0.3 | 3 |
| *Lowland Calcareous Grassland | 17 | 1 | 11 | 7 | 0.2 | 0.5 | 2 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 1200 | 10 | 1250 | 370 | | 100 | 1 |
| *Upland Heathland | 2500 | 3 | 2400 | 1026 | | | 2 |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 300 | 5 | 310 | 145 | 3 | | 1 |
| *Purple Moorgrass and Rush Pasture | 3200 | 9 | 2894 | 1409 | 40 | 4 | 2 |
| *Reedbed | 73 | 16 | 73 | 44 | | 4 | 1 |
| *Lowland Raised Bog | 13 | <1 | 18 | 13 | 1 | 0 | 1 |
| *Blanket Bog | 100 | <1 | 144 | 48 | | 0 | 3 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | P | ? | ? | ? | ? | ? | ? |
| **Maritime Cliff and Slope | 217.8 | 35 | 218 | 130 | 0 | 19* | 1 |
| *Sand Dune | 560 | 9 | 729 | 0 | 13 | 0 | 2 |
| *Coastal Vegetated Shingle | 4 | 4 | 4 | 0 | 0 | 0 | 3 |
| *Saltmarsh | 260 | 5 | | | | | |
| ***Pembrokeshire Totals** | **17,005** | | **19,918** | **6,929** | **1,007** | **467** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**BRECON BEACONS NATIONAL PARK**

**[134538 ha; of which 22% is the area of known priority habitat types]**

Brecon Beacons NP **minimum** targets for some S42 habitats by 2015:-

| Brecon Beacons National Park LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 11 | 5.5 | 83 | 58 | 3 | 1 | 2 |
| *Native Woodland | 5900 | 7 | 8701 | 2487 | 344 | 298 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 2 |
| *Arable Field Margins | 2200[1] | 4 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 660 | 1 | 399 | 179 | 45 | 1 | 3 |
| *Lowland Hay Meadow | 95 | 5.6 | 74 | 44 | 87 | 3 | 3 |
| *Lowland Dry Acid Grassland | 2300 | 6 | 2188 | 910 | 3 | 1 | 2 |
| *Lowland Calcareous Grassland | 120 | 11 | 126 | 85 | 2 | 5 | 2 |
| *Upland Calcareous Grassland | 470 | 72 | 504 | 192 | | | 1 |
| *Lowland Heathland | 410 | 3 | 375 | 111 | | 30 | 2 |
| *Upland Heathland | 11,800 | 15 | 12000 | 5130 | | | 1 |
| Upland Fens Flushes and Swamps | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 130 | 2 | 124 | 58 | 1 | | 2 |
| *Purple Moorgrass and Rush Pasture | 2400 | 7 | 2251 | | 31 | 3 | 3 |
| *Reedbed | 7 | 2 | 9 | 5 | | 0.5 | 3 |
| *Lowland Raised Bog | 16 | <1 | 18 | 13 | 1 | 0 | 2 |
| *Blanket Bog | 5300 | 9 | 6300 | 1967 | | 0 | 1 |
| **Rivers | - | DD | ? | ? | ? | - | 1 |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 2 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 42 | 78 | 42 | 42 | 42 | 0 | 1 |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| ***Brecon Beacons NP Totals** | **29,650** | | **33,111** | **11,223** | **556** | **341** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**SWANSEA**

**[41,984 ha; of which 15% is the area of known priority habitat types]**

Swansea **minimum** targets for some S42 habitats by 2015:-

| Swansea LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 3 | 1.5 | 23 | 16 | 1 | | 2 |
| *Native Woodland | 1600 | 2 | 2486 | 710 | 98 | 85 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 2000[1] | 3 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 540 | 1 | 399 | 179 | 45 | 1 | 3 |
| *Lowland Hay Meadow | 27 | 1.6 | 21 | 12 | 25 | 1 | 4 |
| *Lowland Dry Acid Grassland | 500 | 1 | 365 | 152 | 0.5 | 0.2 | 4 |
| *Lowland Calcareous Grassland | 82 | 7 | 80 | 54 | 1 | 3 | 2 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Lowland Heathland | 900 | 7 | 875 | 259 | | 70 | 2 |
| *Upland Heathland | 580 | <1 | 533 | 228 | | | 3 |
| Upland Fens Flushes and Swamps | ? | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 290 | 5 | 310 | 145 | 3 | | 1 |
| *Purple Moorgrass and Rush Pasture | 1300 | 4 | 1286 | 626 | 18 | 2 | 1 |
| *Wet Reedbed | 61 | 13 | 60 | 36 | | 3 | 2 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 42 | <1 | 144 | 48 | 0 | 0 | 3 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 35.3 | 6 | 35 | 22 | | 3* | 1 |
| *Sand Dune | 480 | 8 | 648 | 0 | 12 | 0 | 1 |
| *Coastal Vegetated Shingle | 4 | 4 | 4 | | | | 2 |
| *Saltmarsh | 1300 | 22 | ? | ? | ? | ? | ? |
| ***Swansea Totals** | **6,406** | | **7,211** | **2,449** | **203** | **168** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**NEATH PORT TALBOT**

**[45,051 ha; of which 17% is the area of known priority habitat types]**

Neath Port Talbot **minimum** targets for some S42 habitats by 2015:-

| Neath Port Talbot LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 3 | 1.5 | 23 | 16 | 1 | 0 | 2 |
| *Native Woodland | 2100 | 3 | 3729 | 1066 | 147 | 128 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 160[1] | <1 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 680 | 1 | 399 | 179 | 45 | 1 | 2 |
| *Lowland Hay Meadow | 72 | 4.2 | 56 | 33 | 65 | 2 | 3 |
| *Lowland Dry Acid Grassland | 2000 | 5 | 1824 | 758 | 3 | 1 | 3 |
| *Lowland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 250 | 2 | 250 | 74 | | 20 | 3 |
| *Upland Heathland | 650 | <1 | 533 | 228 | | | 2 |
| Upland Fens Flushes and Swamp | - | ? | ? | ? | ? | ? | ? |
| *Lowland Fen | 210 | 3 | 186 | 87 | 2 | | 1 |
| *Purple Moorgrass and Rush Pasture | 1300 | 4 | 1286 | 626 | 18 | 2 | 1 |
| *Reedbed | 12 | 3 | 14 | 8 | | 1 | 2 |
| *Lowland Raised Bog | 12# | ? | ? | ? | ? | ? | ? |
| *Blanket Bog | 49 | <1 | 144 | 48 | | | 3 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | ? | <1 | ? | 0 | 0 | 0.3* | 3 |
| *Sand Dune | 190 | 3 | 243 | 0 | 4 | 0 | 2 |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 200 | 3 | | | | | |
| ***Neath Port Talbot Totals** | **7,525** | | **8,664** | **3,107** | **284** | **155** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

# small raised bog recently found in Neath Port Talbot

DD data deficient

**BRIDGEND**

**[25,444 ha; of which 15% is the area of known priority habitat types]**

Bridgend **minimum** targets for some S42 habitats by 2015:-

| Bridgend LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 1 | 0.5 | 8 | 5 | 1 | 0 | 3 |
| *Native Woodland | 810 | 1 | 1243 | 355 | 49 | 43 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 770[1] | 1 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 200 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| *Lowland Hay Meadow | 28 | 1.6 | 21 | 12 | 249 | 1 | 4 |
| *Lowland Dry Acid Grassland | 370 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| *Lowland Calcareous Grassland | 32 | 3 | 34 | 23 | 0.5 | 1 | 3 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Lowland Heathland | 160 | 1 | 125 | 37 | | 10 | 3 |
| *Upland Heathland | 510 | <1 | 533 | 228 | | | 3 |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 25 | <1 | 39 | 18 | 0.1 | | 3 |
| *Purple Moorgrass and Rush Pasture | 660 | 2 | 643 | 313 | 9 | 1 | 2 |
| *Reedbed | 4 | 1 | 5 | 2 | | 0.3 | 3 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Blanket Bog | 53 | <1 | 144 | 48 | 0 | 0 | 3 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | 0 | 0 | 0 | 0 | - |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0.1 | <1 | 0.1 | 0.1 | 0.1 | 0 | 3 |
| **Maritime Cliff and Slope | 7.6 | 1 | 8 | 4 | 0 | 0.3* | 3 |
| *Sand Dune | 850 | 14 | 1134 | 0 | 20 | 0 | 1 |
| *Coastal Vegetated Shingle | 0.5 | 0.5 | 0.5 | 0 | 0 | 0 | 3 |
| *Saltmarsh | 14 | <1 | | | | | - |
| ***Bridgend Totals** | **3,717** | **-** | **4,184** | **1,148** | **337** | **57** | - |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares);

DD data deficient

**RHONDDA CYNON TAFF**

**[37,021 ha; of which 19% is the area of known priority habitat types]**

Rhondda Cynon Taff **minimum** targets for some S42 habitats by 2015:-

| Rhondda Cynon Taff LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 2 | 1 | 15 | 11 | 1 | 0 | 3 |
| *Native Woodland | 1700 | 2 | 2486 | 710 | 98 | 85 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 220[1] | <1 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 130 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| *Lowland Hay Meadow | 44 | 2.6 | 34 | 20 | 40 | 1 | 3 |
| *Lowland Dry Acid Grassland | 1400 | 4 | 1459 | 606 | 2 | 0.6 | 3 |
| *Lowland Calcareous Grassland | 0.2 | <1 | 1 | | | | 4 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 480 | 4 | 500 | 148 | | 40 | 2 |
| *Upland Heathland | 980 | 1 | 800 | 342 | | | 2 |
| Upland Fens Flushes and Swamp | ? | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 130 | 2 | 124 | 58 | 2 | | 3 |
| *Purple Moorgrass and Rush Pasture | 1500 | 4 | 1286 | 626 | 18 | 2 | 1 |
| *Reedbed | 0.8 | <1 | 1 | 1 | | <0.25 | 3 |
| *Lowland Raised Bog | 9 | <1 | 18 | 13 | 1 | | 2 |
| *Blanket Bog | 850 | 2 | 1400 | 437 | | | 2 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| ***Rhondda Cynon Taff Totals** | **7,224** | | **8,189** | **2,997** | **170** | **129** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**MERTHYR TYDFIL**

**[8,647 ha; of which 23% is the area of known priority habitat types]**

Merthyr Tydfil **minimum** targets for some S42 habitats by 2015:-

| Merthyr Tydfil LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***Wood Pasture and Parkland[n] | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Native Woodland | 510 | 1 | 1243 | 355 | 49 | 43 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | ? |
| *Arable Field Margins | - | DD | ? | ? | ? | ? | ? |
| *Coastal Floodplain and Grazing Marsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Hay Meadow | 10 | 0.6 | 8 | 5 | 9 | 0.3 | 4 |
| *Lowland Dry Acid Grassland | 500 | 1 | 365 | 152 | 0.5 | 0.2 | 4 |
| *Lowland Calcareous Grassland | 28 | 3 | 34 | 23 | 0.5 | 1 | 3 |
| *Upland Calcareous Grassland | 30 | 5 | 35 | 13 | | | 2 |
| *Lowland Heathland | 160 | 1 | 125 | 37 | | 10 | 3 |
| *Upland Heathland | 450 | <1 | 533 | 228 | | | 3 |
| Upland Fens Flushes and Swamp | ? | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 25 | <1 | 39 | 18 | 0.1 | | 3 |
| *Purple Moorgrass and Rush Pasture | 260 | <1 | 65 | 140 | 0.1 | 0.1 | 1 |
| *Reedbed | ? | <1 | ? | ? | ? | ? | 4 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 0.2 | <1 | 144 | 48 | | | 2 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 1 | 2 | 1 | 1 | 1 | 0 | 2 |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| ***Merthyr Tydfil Totals** | **1,974** | | **2,592** | **1,020** | **60** | **55** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**VALE OF GLAMORGAN**

**[33,876 ha; of which 8% is the area of known priority habitat types]**

Vale of Glamorgan **minimum** targets for some S42 habitats by 2015:-

| Vale of Glamorgan LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 4 | 2 | 30 | 21 | 1 | 0 | 3 |
| *Native Woodland | 1200 | 1 | 1243 | 355 | 49 | 43 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 4600[1] | 8 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 930 | 2 | 797 | 359 | 90 | 2 | 3 |
| *Lowland Hay Meadow | 47 | 2.8 | 37 | 22 | 44 | 1 | 3 |
| *Lowland Dry Acid Grassland | 68 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| *Lowland Calcareous Grassland | 120 | 10 | 114 | 78 | 2 | 5 | 2 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 45 | <1 | 62 | 18 |  | 5 | 2 |
| *Upland Heathland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Fen | 19 | <1 | 39 | 18 | 0.1 |  | 2 |
| *Purple Moorgrass and Rush Pasture | 120 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 4 | 1 | 5 | 2 |  | 0.3 | 3 |
| *Lowland Raised Bog | 19 | 1 | 18 | 14 | 1 | 0 | 3 |
| *Blanket Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Rivers | - | DD | ? | ? | ? | ? | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | 0 | 0 | 0 | 0 | - |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 41.9 | 7 | 42 | 26 | 0 | 1* | 1 |
| *Sand Dune | 3 | <1 | 3 | 0 | 1 | 0 | 3 |
| *Coastal Vegetated Shingle | 13 | 12 | 13 | 0 | 0 | 0 | 1 |
| *Saltmarsh | 22 | <1 |  |  |  |  |  |
| ***Vale of Glamorgan Totals** | **2,610** |  | **2,578** | **1,082** | **187** | **56** |  |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**CARDIFF**

**[14,905 ha; of which 9% is the area of known priority habitat types]**

Cardiff **minimum** targets for some S42 habitats by 2015:-

| Cardiff LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 2 | 1 | 15 | 11 | 1 | 0 | 3 |
| *Native Woodland | 800 | 1 | 1243 | 355 | 49 | 43 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 2 |
| *Arable Field Margins | 340[1] | <1 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 520 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| *Lowland Hay Meadow | 4 | 0.2 | 3 | 2 | 3 | 0.1 | 5 |
| *Lowland Dry Acid Grassland | 6 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| *Lowland Calcareous Grassland | 1 | <1 | 1 | 0 | 0 | 0 | 4 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 0.5 | <1 | 62 | 18 | | 5 | 3 |
| *Upland Heathland | 2 | <1 | 533 | 228 | | | 3 |
| *Lowland Fen | 5 | <1 | 39 | 18 | 0.1 | | 3 |
| *Purple Moorgrass and Rush Pasture | 46 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 0.5 | <1 | 1 | 1 | | <0.25 | 2 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | ? | <1 | ? | 0 | 0 | 0.3* | 3 |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 34 | <1 | | | | | |
| ***Cardiff Totals** | **1,419** | | **2,144** | **874** | **61** | **48** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**CAERPHILLY**

**[27,676 ha; of which 16% is the area of known priority habitat types]**

Caerphilly **minimum** targets for some S42 habitats by 2015:-

| Caerphilly LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Native Woodland | 1600 | 2 | 2486 | 710 | 98 | 85 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 1 |
| *Arable Field Margins | 380[1] | <1 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 160 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| *Lowland Hay Meadow | 11 | 0.6 | 8 | 5 | 9 | 0.3 | 5 |
| *Lowland Dry Acid Grassland | 860 | 2 | 729 | 303 | 1 | 0.3 | 3 |
| *Lowland Calcareous Grassland | 9 | <1 | 9 | 0 | 0 | 0 | 4 |
| *Upland Calcareous Grassland | 0.7 | <1 | 1 | 1 | | | 3 |
| *Lowland Heathland | 180 | 1 | 125 | 37 | | 10 | 2 |
| *Upland Heathland | 1000 | 1 | 800 | 342 | | | 3 |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 32 | <1 | 39 | 18 | 0.1 | | 3 |
| *Purple Moorgrass and Rush Pasture | 500 | 1 | 322 | 157 | 5 | 0.4 | 4 |
| *Reedbed | 2 | <1 | 1 | 1 | 0 | <0.25 | 3 |
| *Lowland Raised Bog | 1.6 | <1 | 18 | 13 | 1 | | 3 |
| *Blanket Bog | 30 | <1 | 144 | 48 | | | 3 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic and Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | 1 |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| ***Caerphilly Totals** | **4,386** | | **4,762** | **1,671** | **123** | **96** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**BLAENAU GWENT**

**[10,509 ha; of which 29% is the area of known priority habitat types]**

Blaenau Gwent **minimum** targets for some S42 habitats by 2015:-

| Blaenau Gwent LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***Wood Pasture and Parkland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Native Woodland | 290 | <1 | 435 | 124 | 17 | 15 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | ? |
| *Arable Field Margins | 25 | <1 | ? | ? | ? | ? | ? |
| *Coastal Floodplain & Grazing Marsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Hay Meadow | 0.7 | 0.04 | 1 | 0.5 | 1 | 0.02 | 5 |
| *Lowland Dry Acid Grassland | 820 | 2 | 729 | 303 | 1 | 0.3 | 3 |
| *Lowland Calcareous Grassland | 4 | <1 | 1 | 0 | 0 | 0 | 4 |
| *Upland Calcareous Grassland | 11 | 2 | 14 | 5 | | | 3 |
| *Lowland Heathland | 160 | 1 | 125 | 37 | | 10 | 2 |
| *Upland Heathland | 1400 | 2 | 1600 | 684 | | | 2 |
| Upland Fens Flushes and Swamp | - | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 42 | <1 | 39 | 18 | 0.1 | | 3 |
| *Purple Moorgrass and Rush Pasture | 160 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Wet Reedbed | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 160 | <1 | 144 | 48 | | | 2 |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | ? |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| ***Blaenau Gwent Totals** | **3,048** | | **3,153** | **1,359** | **19** | **25** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**TORFAEN**

**[12,439 ha; of which 20% is the area of known priority habitat types]**

Torfaen **minimum** targets for some S42 habitats by 2015:-

| Torfaen LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T.2 Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 1 | 0.5 | 8 | 5 | 1 | 0 | 3 |
| *Native Woodland | 670 | 1 | 1243 | 355 | 49 | 43 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 2 |
| *Arable Field Margins | 130 | <1 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 20 | <1 | 80 | 36 | 9 | 0.2 | 3 |
| *Lowland Hay Meadow | 10 | 0.6 | 8 | 5 | 9 | 0.3 | 5 |
| *Lowland Dry Acid Grassland | 410 | 1 | 365 | 152 | 0.5 | 0.2 | 3 |
| *Lowland Calcareous Grassland | 1 | <1 | 1 | 0 | 0 | 0 | 4 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 120 | <1 | 62 | 18 |  | 5 | 2 |
| *Upland Heathland | 970 | 1 | 800 | 342 |  |  | 3 |
| Upland Fens Flushes and Swamp | ? | DD | ? | ? | ? | ? | ? |
| *Lowland Fen | 12 | <1 | 39 | 18 | 0.1 | 0 | 3 |
| *Purple Moorgrass and Rush Pasture | 110 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 110 | <1 | 144 | 48 | - | - | 3 |
| **Rivers | - | DD | ? | ? | ? |  | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | ? |
| ***Mesotrophic Lakes | 2 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 0 | 0 | 0 | 0 | 0 | 0* | - |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 0 | 0 | 0 | 0 | 0 | 0 | - |
| ***Torfaen Totals** | **2,433** |  | **2,807** | **1,114** | **68** | **49** |  |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**MONMOUTHSHIRE**

**[73,456 ha; of which 10% is the area of known priority habitat types]**

Monmouthshire **minimum** targets for some S42 habitats by 2015:-

| Monmouthshire LBAP area | Area (PHW) | % Welsh resource | T.1 Maintenance target | T2. Achieve condition | T.3 Restoration target | T.4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***[Wood Pasture and] Parkland[n] | 21 | 10 | 150 | 105 | 6 | 2 | 1 |
| *Native Woodland | 4300 | 5 | 6215 | 1775 | 245 | 215 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 2 |
| *Arable Field Margins | 6700 | 11 | ? | ? | ? | ? | 1 |
| *Coastal Floodplain and Grazing Marsh | 2700 | 5 | 1993 | 897 | 225 | 5 | 2 |
| *Lowland Hay Meadow | 120 | 7 | 93 | 54 | 109 | 4 | 2 |
| *Lowland Dry Acid Grassland | 75 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| *Lowland Calcareous Grassland | 12 | 1 | 11 | 8 | 0.2 | 0.5 | 4 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 17 | <1 | 62 | 18 |  | 5 | 3 |
| *Upland Heathland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Fen | 34 | <1 | 39 | 18 | 0.1 |  | 2 |
| *Purple Moorgrass and Rush Pasture | 79 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 0.3 | <1 | 1 | 1 |  | <0.25 | 3 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Rivers | - | DD | ? | ? | ? | - | 1 |
| ***Oligotrophic and Dystrophic lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | ? |
| ***Mesotrophic Lakes | 1 | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | 1.3 | 0.2 | 1 | 0.7 |  | 0.5* | 3 |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 98 | 2 |  |  |  |  |  |
| ***Monmouthshire Totals** | **7,435** |  | **8,661** | **2,987** | **580** | **230** |  |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

**NEWPORT**

**[21,772 ha; of which 23% is the area of known priority habitat types]**

Newport **minimum** targets for some S42 habitats by 2015:-

| Newport LBAP area | Area (PHW) | % Welsh resource | T. 1 Maintenance target | T. 2 Achieve condition | T. 3 Restoration target | T. 4 Expansion target | Provisional Local Priorities |
|---|---|---|---|---|---|---|---|
| Traditional Orchards | - | DD | ? | ? | ? | ? | ? |
| ***Wood Pasture and Parkland | 3 | 1.5 | 23 | 16 | 1 | 0 | 3 |
| *Native Woodland | 510 | 1 | 1243 | 355 | 49 | 43 | 1 |
| **Hedgerows | - | DD | ? | ? | ? | ? | 2 |
| *Arable Field Margins | 1800[1] | 3 | ? | ? | ? | ? | 2 |
| *Coastal Floodplain and Grazing Marsh | 4200 | 8 | 3189 | 1435 | 360 | 8 | 1 |
| *Lowland Hay Meadow | 6 | 0.4 | 5 | 3 | 6 | 0.2 | 5 |
| *Lowland Dry Acid Grassland | 31 | <1 | 182 | 76 | 0.3 | 0.1 | 4 |
| *Lowland Calcareous Grassland | 2 | <1 | 2 | 0 | 0 | 0 | 4 |
| *Upland Calcareous Grassland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Heathland | 0.2 | <1 | 62 | 18 | | 5 | 3 |
| *Upland Heathland | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Lowland Fen | 37 | <1 | 39 | 18 | 0.1 | | 3 |
| *Purple Moorgrass and Rush Pasture | 45 | <1 | 65 | 140 | 0.1 | 0.1 | 5 |
| *Reedbed | 8 | 2 | 9 | 5 | | 0.5 | 1 |
| *Lowland Raised Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Blanket Bog | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Rivers | - | DD | ? | ? | ? | - | ? |
| ***Oligotrophic & Dystrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Ponds | - | DD | ? | ? | ? | ? | ? |
| ***Mesotrophic Lakes | - | DD | ? | ? | ? | ? | ? |
| ***Eutrophic Standing Waters | - | DD | ? | ? | ? | ? | ? |
| Inland Rock Outcrop and Scree | - | DD | ? | ? | ? | ? | ? |
| Calaminarian Grasslands | - | DD | ? | ? | ? | ? | ? |
| Open Mosaic Habitats on Prev. Developed Land | - | DD | ? | ? | ? | ? | ? |
| *Limestone Pavement | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **Maritime Cliff and Slope | ? | <1 | ? | ? | 0 | 0.3* | 3 |
| *Sand Dune | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Coastal Vegetated Shingle | 0 | 0 | 0 | 0 | 0 | 0 | - |
| *Saltmarsh | 130 | 2 | | | | | |
| ***Newport Totals** | **4,969** | | **4,796** | **2,050** | **415** | **57** | |

* figures in hectares; ** figures in kilometres; *** figures in number of sites

[n]only includes figures for numbers of parklands, not wood pasture; [1] arable area (hectares)

DD data deficient

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