# GUIDELINES FOR THE SELECTION OF WILDLIFE SITES IN SOUTH WALES

**Prepared by**
**Gwent Wildlife Trust**
**on behalf of**

**The South Wales Wildlife Sites Partnership**

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Front cover photographs produced by kind permission of Blaenau Gwent County Borough Council and English Nature.

Published by The South Wales Wildlife Sites Partnership

ISBN 0 9548517 0 6

# ACKNOWLEDGMENTS

Many organisations and individuals have contributed to the development of this project, some significantly so. For the initial start of the project and the production of the document, 'The Criteria for the Selection of Wildlife Sites in Gwent, Glamorgan and Carmarthenshire', David Clements and Richard Pryce are especially thanked for all their hard work and input into the report's development. In addition Clare Burrows (CCW), Alison Jones (Caerphilly County Ecologist), Jerry Lewis (Monmouthshire County Council), Linda Moore (Cardiff County Ecologist), Jon Winder (Gwent Wildlife Trust) and Richard Wistow (Rhondda Cynon Taff County Ecologist) were especially generous in sharing their time, expertise and experience. The input provided by the following is also gratefully acknowledged; Nigel Ajax-Lewis (The Wildlife Trust of South & West Wales), Martin Anthoney (Gwent Moth Recorder), Colin Barr (ITE), Gill Barter (CCW), Jamie Bevan (CCW), Rosie Carmichael (Carmarthenshire County Council), Colin Cheesman (Blaenau Gwent County Borough Council), Mike Fowler (Newport City Council), Vaughan Grantham (Cardiff Council Ecologist), Georgina Holdsworth (Monmouthshire County Council), Rachel Hackett (Wildlife Trusts Partnership), Rob Hathaway (Rhondda Cynon Taff County Borough Council), Sarah Hawkswell (Wildlife Trust Partnership), Nicola Hawkeswood (Gwent Wildlife Trust), Deb Hill (Swansea County Borough Council), Dr Charles Hipkin (University of Wales, Swansea), Dr Liz Howe (CCW), Margaret Humphreys (Vale of Glamorgan Council), Richard Jones (CCW), Steve Lucas (The Wildlife Trust of South and West Wales), Clare Mockridge (CCW), Steve Moon (Bridgend County Borough Ecologist), Ian Morgan (CCW), Rob Nottage (Newport CC/Cardiff Naturalists Society), Dr Tim Rich (National Museum & Gallery of Wales), Andrea Rowe (Brecon Beacons National Park), Barry Stewart (Pryce Consultants), Louise Thornhill (CCW), Stephanie Tyler (local naturalist), Suzanne Waldron (Neath & Port Talbot County Borough Ecologist), Steve Williams (Torfaen County Borough Council), Julian Woodman (CCW/BSBI) and Yvonne Wright (Merthyr Tydfil County Borough Council).

The following people, and many named above, have also contributed to the further development and progress of the Wildlife Sites Project, and their input and hard work are greatly thanked; Gemma Bodé (Gwent Wildlife Trust), Sam Bosanquet (Gwent Bryophyte Recorder), Julian Branscombe (Gwent Wildlife Trust), Richard Clarke (Gwent Ornithological Society), Rebecca Davies (Newport City Council), Trevor Evans (BSBI Botanical Recorder, Monmouthshire), Shelley Evans (Mycology specialist), Russel Hobson (Butterfly Conservation), Greg Jones (Swansea County Borough Council), Julian Jones (Radnorshire Wildlife Trust), Tony Prater (RSPB), Kate Pryor (Vale of Glamorgan Council), Ian Rabjohns (Gwent Bat Recorder), Kate Rodgers (CCW), Kris Roberts (Torfaen County Borough Council), Elsa and Adrian Wood (local naturalists/ ecological consultants).

Our apologies go to any individuals who have been inadvertently omitted.

The Guidelines for the Selection of Wildlife Sites in South Wales was compiled by Gemma Bodé, Wildlife Sites Officer, Gwent Wildlife Trust.

The Wildlife Sites Project was supported financially by a grant from the Esmée Fairbairn Charitable Trust, CCW and in various ways by thirteen Local Authorities across South Wales.

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# PART 1

# INTRODUCTION

# 1.0 BACKGROUND

1.1 In 1999 the document 'The Criteria for the Selection of Wildlife Sites in Gwent, Glamorgan and Carmarthenshire' was compiled in its first draft form by David Clements and Richard Pryce. That original document forms the basis of this new working version, which omits the audit of gross habitat types in South Wales and much of the background information that was contained in the original document. The guidelines have been developed through thorough discussion and consultation with a wide audience that has included experienced ecologists, county recorders and local naturalists.

1.2 This document sets out a common set of guidelines for the selection of Wildlife Sites in the South Wales region. The guidelines provide a framework within which individual authorities are free to refine their own detailed criteria for the selection and designation of Wildlife 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 Local Authorities in South Wales (Gwent, Glamorgan and Carmarthenshire), yet flexible enough to allow tailoring to reflect local priorities and circumstances.

1.3 The term 'Wildlife Site' refers specifically to sites of substantive nature conservation value. They are the most important places for wildlife outside legally protected land such as Sites of Special Scientific Interest (SSSIs), and their importance is significant in a more localized context than internationally or nationally designated sites. For this reason Wildlife Sites are sometimes referred to as 'second tier sites'. Unlike SSSIs, their designation is non-statutory.

1.4 Many titles are used for these second tier sites, including Biological Heritage Site, Site of Nature Conservation Interest (SNCI), Site of Biological Interest and Site of Community Interest. Whilst the term 'Wildlife Site' is the title preferred by the Wildlife Trusts Partnership, in South Wales such sites are more usually referred to as Sites of Importance for Nature Conservation (SINCs).

1.5 The use of Wildlife 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 or a combination of these.

1.6 The selection of Wildlife Sites to help maintain and sustain biodiversity should be founded on national, regional, 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. Examples of these could be found amongst Section 74 of the CRoW Act (WAG 2003).

1.7 Wildlife Sites are vital for enabling the planning system to recognise and thus protect or enhance areas of substantive nature conservation value outside the limited network of statutorily protected SSSIs. Planning Policy Wales (March 2002) and TAN5 (Nov.1996) recognise the concept, which is put into effective use through the statutory development plan (or supplementary planning guidance where appropriate) and development control.

1.8 Although originally conceived as a planning tool, Wildlife Site systems now have many other uses. They effectively constitute a database of information on particular habitats and species which can help inform many other areas of work, including the preparation of Local Biodiversity Action Plans and biodiversity monitoring. Where positive management is required, the presence of a Wildlife Site system may act as a means of prioritising resources such as grant aid or advisory services. They can also provide a valuable means of awareness-raising as well as occupying a variety of educational, social and amenity roles.

## 2.0 GEOGRAPHICAL COVERAGE

2.1 The guidelines apply to the geographical area covered by Gwent, Glamorgan and Carmarthenshire. For convenience, these three areas are each considered to comprise a 'county', and the three counties taken together are considered to comprise the 'South Wales region'. In biological recording terms the South Wales region comprises the three Watsonian vice-counties of Glamorgan (VC41), Monmouthshire (VC35) and Carmarthenshire (VC44). Watsonian vice-counties have fixed boundaries, are more-or-less evenly sized and are the preferred county-scale land units for recording the distributions of plants and animals in Britain (Dandy 1969).

2.2 The 1974/75 local government reorganisation split the former county of Glamorgan into three administrative areas (Mid, South and West Glamorgan) and re-designated the county of Monmouthshire as Gwent. In 1996, these arrangements were themselves replaced with a series of twelve new Unitary Authorities of varying size.

2.3 In the 1974/75 reorganisation Carmarthenshire became part of the Dyfed 'super-county'. It re-emerged as a Unitary Authority in 1996 along with Pembrokeshire and Ceridigion.

2.4 The developing LBAP process has seen the re-emergence of the old county units for co-ordination purposes. The region has been split into 'Greater Gwent', 'Glamorgan' and 'Carmarthenshire', based largely on the old Watsonian vice-county arrangements. The present study has therefore also adopted these boundaries for the purposes of defining 'Gwent', 'Glamorgan' and 'Carmarthenshire'.

2.5 Any use of the term 'Regional' should be taken as reference to the 'South Wales region' as defined above in 2.1. Any use of the term 'Local' in the appropriate context should be taken as reference to the Local Authority area.

## 3.0 THE PARTNERSHIP

The South Wales Wildlife Sites Partnership was formed in 1999, and currently includes:

Blaenau Gwent County Borough Council
Brecon Beacons National Park
Bridgend County Borough Council
Caerphilly County Borough Council
Cardiff Council
Carmarthenshire County Council
Swansea County Borough Council
Methyr Tydfil County Borough Council

Monmouthshire County Council
Neath & Port Talbot County Borough Council
Newport City Council
Rhondda Cynon Taff County Borough Council
Torfaen County Borough Council
Vale of Glamorgan Council
Countryside Council for Wales
Gwent Wildlife Trust
The Wildlife Trust of South and West Wales

This partnership was formed to create and develop this unifying set of guidelines for the selection of Wildlife Sites. The Partnership meets regularly at steering group meetings in order to achieve this aim.

The Wildlife Sites Project is also in contact with;

- Country Land and Business Association (South Wales)
- Environment Agency
- Farmers Union of Wales (Gwent)
- Forestry Commission
- Glamorgan Biodiversity Action Group
- Greater Gwent Biodiversity Action Group
- National Farmers Union (Gwent)
- Welsh Development Agency

## 4.0 THE GUIDELINES

4.1 A successful Wildlife Site system requires rigorous criteria to enable Wildlife Sites to be identified. This document provides Regional Guidance for individual Local Authorities to use as a framework for their own Wildlife Site criteria, allowing appropriate local characteristics and features to be considered accordingly. The system can then demonstrate to Local Authorities, landowners, land managers and others why a particular site has qualified or not.

4.2 General guidelines for choosing and evaluating sites of nature conservation importance were first formulated by Ratcliffe (1977) in the *UK Nature Conservation Review*. These are sometimes referred to as the 'Ratcliffe Criteria', representing 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.

4.3 A good model for the selection of Wildlife Sites 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.

4.4 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 (i.e. annually in the first instance).

4.5 It has become usual practice to differentiate between habitat-based and species-based guidelines when creating a framework for the identification of Wildlife Sites. 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. Many sites however, will be of interest on both grounds.

## *Habitat-based Guidelines*

4.6 The habitat guidelines are structured according to general habitat categories, such as 'woodlands', 'grasslands', 'heathlands' etc., within which specific thresholds for inclusion are set.

4.7 The guidelines ensure inclusion of all except the most degraded examples of habitats of national importance. Typical examples of nationally threatened habitats include, *inter alia*, heathlands, unimproved calcareous grasslands, unimproved neutral grasslands and marshy grasslands.

4.8 The guidelines should also ensure inclusion of habitat types which may not be threatened nationally but which are either rare in the area under consideration, or are especially distinctive or characteristic of the area. The emerging LBAPs are proving helpful in refining the identification of these regional and local priorities.

4.9 The distinction between lowland and upland habitats has been emphasised 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 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.

4.10 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 most 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.

4.11 Many of the habitat-based guidelines refer to the National Vegetation Classification (NVC) (Rodwell 1991 et seq.). However selection of appropriate Wildlife Sites 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, a list of

indicator species has been compiled for certain habitats. Where considered appropriate, this has been accompanied by a threshold number of species which will generally need to be reached before a site can be selected as a Wildlife Site on the basis of its vegetation type and diversity.

4.12 The 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 neutral grassland vegetation type. 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 selection as a Wildlife Site.

4.13 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 vegetation types, species that are regularly found in agriculturally improved grasslands are generally excluded from the species lists. Those plant species rare enough to merit Wildlife Site designation on the basis of their presence alone can be found in the Vascular Plant section (S7). However in some cases they can also be found in the species list for the vegetation type in which they tend to be found. The status of a plant species thought to be rare should therefore be confirmed by checking the lists in Section S7, even if the species is present in one or more of the appropriate habitat type species lists.

4.14 The species lists and appropriate threshold values were drawn up by experts familiar with South Wales 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. 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**

4.15 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 H20) Mosaic Habitats.

## *Species-based Guidelines*

4.16 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.

4.17 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).

4.18 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.

4.19 Sites which are known to support species which are:

- listed in the EC Habitats Directive, Annexes II and IV;
- listed in the Section 74 list of Species of Principle Importance (produced by the Welsh Assembly Government, under its obligations with respect to the CROW act 2000);
- listed in the UK Red Data Books, Categories 1-3;
- listed as 'Nationally Scarce' or 'Nationally Notable' in the National Species Reviews;
- 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.

4.20 Sites should also be considered where these support species which are listed in the UK BAP 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. The emerging LBAPs should assist in the identification of local priorities, but there are likely to remain significant gaps in the data 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.

4.21 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 Wildlife 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.

4.22 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. Wildlife 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.

4.23 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

5.1 The Wildlife Sites Handbook advises that the criteria for the selection of Wildlife Sites on habitat grounds should consider the following primary elements:

- rarity;
- size;
- naturalness/typicalness;
- diversity;

and that 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***

5.2 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 county Phase 1 Survey Reports, *British Plant Communities* (Rodwell 1991 *et seq*) and the emerging Gwent, Glamorgan and Carmarthenshire HAPs.

5.3 The presence of a rare species is also a key consideration. Such species represent a feature in their own right (see section 4.16-4.23) whilst they are also very important as an element of the particular habitat or habitat mosaic on which they depend.

***Size***

5.4 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 Wildlife Site 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 Wildlife Site 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 Wildlife Site. Further guidance can be found in the Site Boundary section, 7.4-7.7.

***Naturalness/Typicalness***

5.5 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.

5.6 Use of the NVC in the South Wales Wildlife Site 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 Local Authorities in South Wales do not have staff in-house who are able to analyse NVC data, and there are probably none which would have the staff resources necessary to survey all potential Wildlife Sites at NVC level.

5.7 Nevertheless, there are certain key classes of habitats where the NVC is very useful, for example neutral grasslands and marshy grasslands. South 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***

5.8 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 pools, 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.

5.9 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.

5.10 Another aspect of diversity lies in the interaction between habitats. A potential Wildlife Site 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 Wildlife Site 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***

5.11 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 Wildlife Site status.

5.12 *Position in an ecological unit* may be an important consideration, especially in circumstances where a site forms a valuable adjunct to another Wildlife Site or to a 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.

5.13 *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.*

5.14 *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.

5.15 *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 WILDLIFE SITES IN A PLANNING CONTEXT

6.1 A Wildlife 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 Wildlife Sites. The

non-statutory designation can then be used to inform decisions made by a wide variety of individuals and organisations.

6.2 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 Wildlife 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".

6.4 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.

6.4 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.

6.5 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.

6.6 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.

6.7 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 Wildlife Sites and what the nature of the interest is.

6.8 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.

6.9 Sources of funding for the management of sites should be targeted towards Wildlife 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.

6.10 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.

## 7.0 APPLICATION OF THE GUIDELINES

**Relationship with Nationally Designated Sites**

7.1 Statutory Sites of Special Scientific Interest and non-statutory Wildlife Sites do not generally overlap in South 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 Wildlife Sites in strategic planning documents or supplementary planning guidance.

Geological Sites

7.2 Many potential Wildlife Sites in South 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.

7.3 Wildlife Sites should be designated entirely on ecological grounds, without reference to geology except where this is a factor affecting or determining the ecological value. 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 second tier biological 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.

**Site Boundaries**

7.4 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 Wildlife Sites of sufficient size to allow reasonable long-term ecological viability and continuation or introduction of favourable management.

7.5 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.

7.6 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.

7.7 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 banksides.

## 8.0 SITE SELECTION PROCESS

Survey methodology

**8.1 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.**

**8.2 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.**

**8.3 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)

8.4 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**

8.5 Regular re-survey and monitoring of Wildlife Sites is essential to ensure the system is effectively protecting the sites and to determine where management effort is most required. 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.

# PART 2

# DETAILED GUIDELINES FOR SELECTION

# HABITAT GUIDELINES

## H1) WOODLANDS

The following should be considered for selection:

- all 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
- semi-natural woodlands, of whatever size, which support an assemblage of ancient woodland indicator species (see Table 1)
- all semi-natural beech and yew woodlands
- all semi-natural upland woodlands
- all semi-natural wet woodlands
- planted/re-planted wet woodland with semi-natural ground flora or other areas of interest such as ditches, pools and marshy areas

'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' below). '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). Many of these woodlands, where greater than 2ha in extent, are identified in the *Ancient Woodland Inventories* for South Wales (Sothern 1986; Lister & Whitbread 1988; Walker & Buckley 1989).

'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 Table 1 is for guidance only and is 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 Local Authority by Local Authority 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.

A number of ancient woodland sites in South Wales have been replanted either with conifers, broadleaved trees or a combination of the two. These may retain some elements of their ancient woodland interest, especially in the ground flora. Ideally the extent and significance of this residual interest should be confirmed by means of detailed survey.

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.

South Wales contains numerous conifer, and mixed plantation woodlands. Whilst not generally considered to be as valuable for nature conservation as semi-natural woodlands, the larger areas especially may nevertheless be significant for fauna, including certain specialist breeding birds such as nightjar for example. The selection of such sites is best carried out with reference to the presence of rare species or significant species-assemblages (see Species Guidelines).

***Context***

Woodland habitats are dealt with under two broad headings in the UK BAP, namely 'Broadleaved, Mixed and Yew Woodlands' and 'Coniferous Woodlands', with 'Priority Habitats' identified as including:

- upland oak woods
- upland mixed ash woodlands
- lowland beech woods
- wet woodlands

The *Welsh Biodiversity Guide* (ALGE 1999) highlights ancient woodlands and other woodlands and plantations as Priority Habitats in the Welsh context. The Welsh Assembly Government's CROW Act 2000 Section 74 *List of Species and Habitats of Principal Importance for the Conservation of Biological Diversity* in Wales (2003) lists Lowland Mixed Deciduous, Lowland Beech & Yew, Upland Oak, Upland Mixed Ash, Upland Birch and Wet Woodlands.

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 following lists of ancient woodland vascular plants 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.

## Table 1. Semi-natural woodland vascular plants

| | Scientific Name | Common Name |
|---|---|---|
| ***Semi-natural woodland vascular plants*** | *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 |

***Semi-natural woodland vascular plants***

| 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 |

## H2) PARKLANDS, ORCHARDS AND VETERAN TREES

The following should be considered for selection:

- parkland sites which are believed to have been derived from ancient woodland and which continue to support large mature trees

- 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.

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

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). South Wales contains numerous remnants of medieval deer parks and pasture-woodland sites. Some of these may be identifiable from sources such as Cantor (1983), old maps etc. Such sites were often created from pre-existing ancient woodland and are today characterised by the presence of large, over-mature (or 'veteran') trees, often of pollard form, which in turn may support characteristic and declining plant and animal communities, including many ancient woodland indicator species.

'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 H14). 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.

Orchards represent a traditional and 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 local species in the UK. Many historic fruit varieties may persist in old orchards and are of potential value to fruit-breeders.

***Context***

Lowland wood pastures and parklands fall within the broad habitat of 'Broadleaved, Mixed and Yew Woodlands' in the UK BAP and are identified as a 'Priority Habitat'. Similarly the *Welsh Biodiversity Guide* (ALGE 1999) highlights wood pasture, parkland and veteran trees as Priority Habitats in the Welsh context, and WAG (2003) lists Wood Pasture & Parkland as a Principle Habitat of Importance for Conservation in Wales in the Section 74 list.

## H3) SCRUB COMMUNITIES

The following should be considered for selection:

- structurally-diverse and species-rich mixed scrub sites
- significant stands of gorse

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 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.

***Context***
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.

## H4) NEUTRAL GRASSLANDS

The following should be considered for selection:

- all examples of:
  meadow foxtail - great burnet grasslands (MG4)
  crested dog's-tail - common knapweed grasslands (MG5)
  red fescue - creeping bent - silverweed grasslands (MG11)
  tall fescue grasslands (MG12)
  creeping bent - marsh foxtail grasslands (MG13)

- all relatively species-rich (as defined below) examples of other neutral grasslands (which could include MG1, MG6 & MG10) of any significant extent.

Neutral (or 'Mesotrophic') grasslands 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*).

In practice it is suggested that 'relatively species-rich' is represented by sites with at least 8 species present from Table 2, a list of species indicative of unimproved neutral grasslands. Whilst qualifying sites will in the main be referable to one or more of the NVC types initially listed above, the threshold species guideline referring to Table 2 may be applied to grasslands of any NVC type, or where an NVC type has not been determined. Some of the Wildlife Sites qualifying under these guidelines will be 'atypical' in NVC terms, for instance some grasslands on roadside verges, woodland edges, post-industrial land or sea walls. Consideration should also be given to grasslands with less than 8 such species present, but where those indicator species present are occurring at a high frequency throughout.

***Context***

The *Welsh Biodiversity Guide* (ALGE 1999) highlights all neutral grasslands as priorities in the region, whilst the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003) includes Neutral Lowland Meadows. The Phase 2 surveys carried out by CCW in the 1990's provide a clear picture of the NVC communities of greatest significance in South 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.

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.

MG5 grassland is a particular feature of South Wales, being especially associated with the edges of the South Wales coalfield. This species-rich community has declined greatly throughout its British and European range, and all remaining examples are therefore of value. The community is characterised by very low levels of rye-grass (*Lolium perenne*) and high frequencies of grasses such as red fescue (*Festuca rubra*), crested dog's-tail (*Cynosurus cristatus*) and common bent-grass (*Agrostis capillaris*), together with high diversity and proportion of forb species which give a characteristic 'flowery' appearance. The latter typically include bird's-foot trefoil (*Lotus*

*corniculatus*), and common knapweed (*Centaurea nigra*), together with, *inter alia*, red clover (*Trifolium pratense*), hawkbits (*Leontodon* spp.), cowslip (*Primula vulgaris*), ox-eye daisy (*Leucanthemum vulgare*) and buttercups (*Ranunculus* spp.). Orchids, including the scarce and declining green-winged orchid (*Orchis morio*), are often present.

MG5 grassland was probably the natural community type for much of the lowland grassland of South Wales in its original, unmodified state. Agricultural improvement has altered huge areas into the less diverse and more widespread MG6 grasslands (here referred to as 'semi-improved neutral grassland'), or to other improved grassland communities of low diversity and value. Nevertheless species-rich examples of MG6 are still comparatively widespread and locally common in Wales, and can be worthy of recognition and conservation. The plant community is generally similar to MG5 but contains much higher frequencies of rye-grass and forbs such as white clover (*Trifolium repens*), common mouse-ear (*Cerastium fontanum*) and daisy (*Bellis perennis*). Species-rich stands may also include species such as common knapweed (*Centaurea nigra)*, meadow vetchling (*Lathyrus pratensis*) and bird's-foot trefoil (*Lotus corniculatus*).

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. Both tend to be scarce and localised in South Wales.

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 widespread but localised in South Wales. 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.

## Table 2. Indicator species for neutral grasslands

| Indicator species for neutral grasslands | 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 |

***Indicator species for neutral grasslands***

| 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 officinalis* | greater burnet |
| *Saxifraga granulata* | meadow saxifrage |
| *Saxifraga tridactylites* | 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 officinalis* | heath speedwell |
| *Vicia cracca* | tufted vetch |
| *Vicia orobus* | wood bitter-vetch |
| *Viola riviniana* | common dog-violet |
| *Vulpia bromoides* | squirreltail fescue |

## H5) CALCAREOUS GRASSLANDS

The following should be considered for selection:

- all examples of unimproved calcareous grassland
- all examples of species-rich semi-improved calcareous grassland

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*).

Calcareous grasslands are better represented in Glamorgan than in Carmarthenshire or Gwent. However it is considered that all relatively diverse calcareous grasslands should be considered for selection as Wildlife Sites, regardless of the part of South Wales in which they are located. 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 a 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.

***Context***
The UK BAP identifies lowland and upland calcareous grasslands Priority Habitat types. The *Welsh Biodiversity Guide* (ALGE 1999) highlights all calcareous grasslands as priorities in the region, as does the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003).

The SSSI selection guidelines (NCC 1989) identify a number of calcareous grassland NVC types as of particular importance. Three of these are very scarce in South Wales – CG6 (downy oat-grass grassland), CG7 (sheep's fescue - mouse-ear hawkweed - thyme grassland) and CG8 (blue moor-grass - small scabious grassland). However three important communities occur widely in South Wales – CG1 (sheep's fescue - carline thistle grassland, CG2 (sheep's fescue - meadow oat-grass grassland) and CG3 (upright brome grassland). One further important community CG10 (sheep's fescue - common bent - thyme grassland), occurs inland in north and western parts of South Wales.

Carboniferous limestone occurs extensively along the edge of the South Wales coalfield, which passes through South Wales, but this is usually overlain by non-calcareous soils supporting circum-neutral grasslands. The occurrence of calcareous grasslands is therefore quite localised and they are seldom extensive, although secondary calcareous grassland on post-industrial land is more scattered in its distribution. The grassland that develops on such 'secondary' sites is often only poorly described by the NVC but may nevertheless be species-rich and of high conservation value.

## Table 3. Indicator species for calcareous grasslands

| Indicator species for calcareous grasslands | Scientific Name | Common Name |
|---|---|---|
| | *Allium vineale* | wild onion |
| | *Aloina aloides* | |
| | *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* | |
| | *Ditrichum gracile* | |
| | *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* | |
| | *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* | |
| | *Leontodon hispidus* | rough hawkbit |

***Indicator species for calcareous grasslands***

| 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* | |
| *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* | |
| *Trichostomum crispulum* | |
| *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 |
| *Weissa controversa* | |
| *Weissa brachycarpa* | |
| *Weissa microstoma* | |

## H6) ACID GRASSLANDS

The following should be considered for selection:

- all examples of unimproved acid grassland
- all examples of semi-improved acid grassland which retain a relatively high diversity of indicator species

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 is given in Table 4. A site should be considered for selection if 7 or more of these species are recorded.

***Context***
The UK BAP identifies lowland dry acid grassland as a Priority Habitat in the UK, as does the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003). The *Welsh Biodiversity Guide* (ALGE 1999) does not refer directly to acid grasslands. 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).

The CCW Phase 2 grassland survey found species-rich U4 grassland to be widespread in lowland South Wales and of high conservation significance. U3 grassland is scarce in South Wales, being more usually confined to the south-west of England, but it does occur in Glamorgan. 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*).

Acid grassland dominates large areas of upland South 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.

## Table 4. Indicator species for acid grasslands

| Indicator species for acid grasslands | Scientific Name | Common Name |
|---|---|---|
| | *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* | |
| | *Erica cinerea* | bell-heather |
| | *Erophila verna* | whitlow grass |
| | *Festuca ovina* | sheep's fescue |
| | *Galium saxatile* | heath bedstraw |
| | *Hieracium spp.* | hawkweed spp. |
| | *Hylocomium splendens* | |
| | *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 |
| | *Pleurosium schreberi* | |
| | *Polygala serpyllifolia* | heath milkwort |
| | *Polytrichum formosum* | |
| | *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 |

## H7) MARSHY GRASSLANDS

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)

'Marshy grassland', and land known colloquially as 'marsh', refers to a diffuse category of wetland habitats where the water table is predominantly below ground level for most of the year. A wide range of soils may be involved, but they do not usually occur on peat deeper than 0.5m. The vegetation is usually grass or rush dominated and may include dense swards of purple moor-grass (*Molinia caerulea*), as well as rush (*Juncus* spp.) or sedge (*Carex* spp.) meadows, and forb-rich wet meadows and pastures.

A list of the vascular plant species indicative of species-rich communities is given in Table 5. A site should be considered species-rich if 12 or more species from this table are recorded.

***Context***
The UK BAP identifies 'Fen, Marsh and Swamp' as a single broad habitat. Within the category here referred to as 'Marshy Grassland', purple moor-grass and rush-pastures are listed as Priority Habitat in the UK and are *Habitats of Principle Importance for Conservation in Wales* (WAG 2003).

Marshy grassland habitats 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. It has been found in Gwent and Glamorgan. 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*).

M23 soft/sharp-flowered rush-marsh bedstraw rush-pasture is more widespread in the north and west of Britain, and is extremely variable in composition and species-richness. Species-rich examples are particularly associated with the edges of the South Wales coalfield, and typically support high frequencies of forb species such as wild angelica (*Angelica sylvestris*), meadowsweet, ragged robin (*Lychnis flos-cuculi*), skullcap (*Scutellaria galericulata*), lesser spearwort (*Ranunculus flammula*), marsh-orchids (*Dactylorhiza* spp.), marsh-marigold (*Caltha palustris*) and purple loosestrife (*Lythrum salicaria*). Species-poor examples dominated by soft rush with few

associates and no uncommon species should not generally be considered good candidates for designation as a Wildlife Site.

M24 purple moor-grass-meadow thistle fen-meadow is rare nationally but reasonably widespread, if localised in South Wales, on moist, nutrient-rich circum-neutral soils, often peaty but with base-rich flushing. 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 Table 5, 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.

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. About 5000ha of these habitats are estimated to occur in Glamorgan alone, representing ~10% of the total UK resource.

The marshy grasslands of South Wales are typically of the M25 and M23 communities, with M25 probably the more extensive overall, especially in the valleys. Marshy grasslands *per se* are scarcer in Monmouthshire and the Vale of Glamorgan, however, and in these areas M23 often predominates. The M24 fen-meadow community is considerably rarer, especially in Gwent, whilst M27 is typically present as small stands only. Unimproved and well-managed examples of these communities may be very species-rich and the M23-M25 communities are important in supporting the rare and protected marsh fritillary butterfly (*Eurodryas aurinia*) and the double-line moth (*Mythimnia turca*), a UK Priority species.

It should be noted that the 'marshy grassland' guidelines should be applied to any marsh in the broadest sense (whilst bearing in mind that separate guidelines apply to fens, flushes, reedbeds and other swamps). Many examples of 'marsh' cannot be readily attributable to a single NVC type, hence the need for application of the species-richness guideline.

## Table 5. Indicator species for marshy grasslands

| Indicator species for marshy grasslands | 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 |
| | *Galium uliginosum* | fen bedstraw |
| | *Genista anglica* | petty whin |

## *Indicator species for marshy grasslands*

| Scientific Name | Common Name |
|---|---|
| *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 |

***Indicator species for marshy grasslands***

| 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 |

## H8) COASTAL AND FLOODPLAIN GRAZING MARSH

The following should be considered for selection:

- examples of 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

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. Well-known examples in the South Wales region include the Gwent Levels (Newport and Monmouthshire) and Margam Moors (Neath Port-Talbot). 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. A few grazing marshes in South Wales are still subject to low-intensity farming practices and consequently retain a rich variety of marshland and wet-meadow plants and invertebrates. Some of the least modified grazing marsh grasslands occur in Glamorgan, within the Swansea, Neath Port Talbot and Rhondda-Cynon-Taff LBAP areas. 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.

***Context***
The UK BAP identifies 'Improved Grassland' as a broad habitat, containing coastal and floodplain grazing marsh as a Priority Habitat. The habitat is also identified as one of *Principle Importance for Conservation in Wales* (WAG 2003).

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*).

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.

## H9) BRACKEN COMMUNITIES

The following should be considered for selection:

- stands of bracken with a species-rich ground flora

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)* for which bracken stands are a very important habitat in South Wales.

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.

***Context***
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.

## H10) HEATHLANDS AND GRASS-HEATH COMMUNITIES

The following should be considered for selection:

- all examples of unmodified 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 examples of unmodified 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

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. Overgrazing, agricultural improvement, afforestation, land reclamation and opencasting have all reduced the extent of upland heathland and grass heath in South Wales, whilst lowland heath is even more restricted in its extent. 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.

***Context***
Heathland habitats are included in the 'Dwarf Shrub Heath' category of the UK BAP, which identifies both upland and lowland heaths as Priority Habitats for conservation. These habitats are also identified in the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003).

The *Welsh Biodiversity Guide* (ALGE 1999) also identifies these categories as priorities in the region. Draft HAPs have been drawn up for lowland heathland in Glamorgan and Gwent.

## H11) FENS, REEDBEDS AND OTHER SWAMPS

The following should be considered for selection:

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

- all examples of reedbed and other tall swamps

'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.

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.

***Context***

The UK BAP identifies 'Fen, Marsh and Swamp' as a single broad habitat. Within this category 'Fen' and 'Reedbed' are listed as Priority Habitats, and also feature on the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003). A wide range of NVC communities may occur in 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).

The *Welsh Biodiversity Guide* (ALGE 1999) highlights reedbeds especially as being a priority for conservation in the region. 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.

## H12) BOG HABITATS AND FLUSHES

The following should be considered for selection:

- all examples of 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

'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.

Lowland raised bog is a scarce habitat in Britain as a whole but appears to be present in the Rhondda Cynon Taff, Caerphilly, Carmarthenshire and Neath-Port Talbot districts of Glamorgan at least, although it can be difficult to differentiate this habitat from related types such as valley mire and basin mire fens. Upland blanket-bog and raised bog are locally extensive in the uplands and most examples are likely to be of value.

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 smaller 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.

***Context***

The UK BAP identifies 'Bogs' as a broad habitat category, within which lowland raised bog and blanket bog are identified as Priority Habitats. These habitats also feature on the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003). These lists do not specifically recognise flushes as an independent habitat type, instead including them within a broader and more complex system of mire classification

## H13) COASTAL HABITATS

The following should be considered for selection:

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

'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.

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

'Unmodified' sand dunes are those that have not been developed, planted with trees or re-seeded, and which support semi-natural habitats typical of, and native to, the location.

- examples of undegraded semi-natural coastal and littoral habitats (including saltmarsh, shingle, open sand and mud, mudflats, gravels and rocks, tubeworm reefs and weed beds etc.)

'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 (or 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.

- all examples of saline lagoons

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

***Context***
The UK BAP identifies the following as Priority Habitats:
- Maritime cliffs & slopes
- Coastal sand-dunes
- Coastal vegetated shingle
- Coastal saltmarsh
- Mudflats
- Saline lagoons

These habitats are also on the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003). The *Welsh Biodiversity Guide* (ALGE 1999) lists sand dunes, estuaries and saltmarsh, sea cliffs and slopes as priorities in the region.

It is clearly the intention of the UK BAP and the emerging LBAPs that all remnants of unmodified semi-natural coastal habitats should be conserved in the region as far as possible. Since these comprise interlinked and co-dependant habitats, it is considered justified to use broad blanket guidelines for the selection of coastal Wildlife Sites which can be modified by expert judgement to

ensure the protection of the widest range of features and the fullest expression of the transitions and successions.

## H14) MARINE HABITATS

Marine habitats are generally out of the scope of Unitary Authority boundaries, on occasions however this is not the case, for example in partnerships such as those involving Coastal Zone Management.

They are excluded from the present study however, pending future consideration by specialists in this field. In the interim, all examples of Priority Habitats as identified by the UK BAP (UK Biodiversity Group 1999) should be considered for selection.

## H15) WATERCOURSES

The following should be considered for selection:

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

- all examples of 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).

'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.

Coastal levels and floodplain grasslands such as the Gwent Levels intimately associated with ditches (or 'reens') support rare plants and aquatic invertebrates. Rare or uncommon species, and assemblages of characteristic commoner species, may be present in such situations. Examples might include uncommon plants associated with periodic cycles of inundation, nesting waders such as snipe and flocks of wintering waders.

***Context***

Under the broad category of 'Rivers and Streams', the UK BAP lists only Chalk Rivers as a Priority Habitat in the UK. However, the *Welsh Biodiversity Guide* (ALGE 1999) lists 'Rivers and Streams' generally as a priority in the region. 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.

## H16) STANDING OPEN WATER

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

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

'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.

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.

***Context***
The UK BAP lists mesotrophic standing waters, eutrophic standing waters and aquifer fed naturally fluctuating water bodies as Priority Habitats. The *Welsh Biodiversity Guide* (ALGE 1999) lists all standing open waters as priorities for conservation in the region.

## H17) HEDGEROWS

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)

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. In South Wales especially, 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.

***Context***
The UK BAP recognises a range of habitats under the category of 'Boundary and Linear Features'. Within this category ancient and/or species-rich hedgerows are listed as a Priority habitat and are also featured in the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003). Similarly the *Welsh Biodiversity Guide* (ALGE 1999) identifies species-rich hedges as priorities for conservation in the region.

## H18) POST-INDUSTRIAL LAND

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

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 2-5) and the following list of characteristic (but not ubiquitous) additional species in Table 6 are present.

A diverse range of post-industrial sites are found throughout South 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, even if none of the habitat elements are of Wildlife Site quality in their own right.

***Context***

This sort of land is covered by the UKBAP broad habitats 'Built up areas and gardens' and 'Inland rock'. It is unfortunate that this worthy document perpetuates the use of the term "waste and derelict ground" as much of what is included here is far from derelict. Some of the older areas of old quarry workings and mine spoil heaps can develop vegetation that is hard to distinguish from semi-natural areas and have developed a diverse flora and associated fauna. It is worthy of note that areas of mine & quarry workings near Merthyr Tydfil have recently been included within a site that has been notified as an SSSI for its vegetation.

## Table 6. Indicator species for post-industrial land

| Indicator species for post-industrial land | 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* | |
| | *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* | |
| | *Lotus corniculatus* | birds-foot trefoil |
| | *Matricaria recutita* | scented mayweed |
| | *Marrubium vulgare* | white horehound |
| | *Mentha arvensis* | corn mint |

***Indicator species for post-industrial land***

| Scientific Name | Common Name |
|---|---|
| *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 cilliare* | |
| *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 |

## H19) SPECIES-RICH TILLAGE FIELDS AND MARGINS

The following should be considered for selection:

- All examples of fields that contain eight or more of the species listed in table 7

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 either 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. The use of the term 'tillage fields' as opposed to 'arable fields' reflects the intended inclusion of root crops in this habitat category.

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*) (Gower, Swansea), and shepherds needle (*Scandix pecten-veneris*) (Vale of Glamorgan), 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. For example, the brown-banded carder bee (*Bombus humilis*), a Priority Species, is widespread in extensive semi-natural coastal habitats in south Wales and populations in the dunes at Kenfig (Bridgend) utilise adjacent agricultural land.

***Context***

'Cereal Field Margins' are identified as a Priority Habitat of the UK BAP and are a *Habitat of Principle Importance for Conservation in Wales* (WAG 2003). Examples should be considered where these support communities of rare and characteristic plants (see below), or which are known to be of special importance in supporting key fauna species such as game birds.

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.

## Table 7. Indicator species for tillage fields and margins (South Wales)

| Indicator species for tillage fields and 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 |

## H20) 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 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. However, it is known that there are large areas of less intensively managed upland remaining in South Wales which contain many individual features of nature conservation value, and which collectively form large expanses of open country supporting a wide range of characteristic species.

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.

## H21) ROCK EXPOSURES

The following should be considered for selection:

- all occurrences of 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)

- inland cliffs, crags and associated screes, where these support species of interest

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. In many cases, these features are likely to fall within mosaics of other surrounding habitats that also qualify for selection.

***Context***
'Limestone Pavement' is a Priority Habitat of the UK BAP and features on the Section 74 *List of Habitats of Principle Importance for Conservation in Wales* (WAG 2003).

## H22) OTHER FEATURES

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

- all examples of areas where there are significant populations of anthills and/or where several are estimated to be in excess of 50 years old

Some linear features include 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 (H4-7) 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.

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.

# SPECIES GUIDELINES

## 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 & c) Regulations 1994.

### 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 UK/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*)
  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:-

- any significant roosting sites including 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 8 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 8 below.

**Table 8. Significance levels for bats recorded in South Wales**

| **Species** ++ (Priority species) + (Species of conservation concern) | | **Maternity Roost** | **Other roost types e.g. hibernation** | **Known to breed in Wales** | **Recorded in S.Wales - single/bat detector** |
|---|---|---|---|---|---|
| **Barbastelle** (*Barbastella barbastellus)* | ++ | Any | Any | | Y |
| **Bechstein's** (*Myotis bechsteinii*) | ++ | Any | Any | | |
| **Brandt's** (*Myotis brandti*) | + | 10 | 5 | Y | |
| **Brown long-eared** (*Plecotus auritus*) | + | 25 | 5 | Y | |
| **Common pipistrelle** (*Pipistrellus pipistrellus*) | ++ | 50 | 5 | Y | |
| **Daubenton's** (Myotis daubentoni) | + | Any | Any | Y | |
| **Greater horseshoe** (*Rhinolophus ferrumequinum)* | ++ | Any | Any | Y | |
| **Leislers** (*Nyctalus leisleri)* | + | Any | Any | | Y |
| **Lesser horseshoe** *(Rhinolophus hipposideros)* | ++ | Any | Any | Y | |
| **Nathusius' pipistrelle** (*Pipistrellus nathusii*) | + | Any | Any | | |
| **Natterer's** (*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** (*Myotis mystacinus*) | + | 10 | 5 | Y | |

## S2) BIRDS

Tables 9 & 10 below set out an assessment of those bird species, which are considered to be of conservation significance in the study area. Two lists have been created, namely "Breeding Birds of Conservation Significance in Gwent, Glamorgan and Carmarthenshire" and "Wintering and Passage Birds of Conservation Significance in Gwent, Glamorgan and Carmarthenshire". Each of these lists has been split into two, indicating those species which would be of such significance to allow the designation of a Wildlife Site (on the A list), and those which would contribute to that designation (on the B list).

Selection was based on each species' status within the region using: 'Red' or 'Amber' listing, the Welsh Assembly Government's CROW Act 2000 Section 74 *List of Species and Habitats of Principal Importance for the Conservation of Biological Diversity in Wales* (2003), 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 habitats. 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 precies details of numbers, and any additional species, should be agreed at LBAP partnership level. A 'species diversity' element is also included in these guidelines.

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 9
- sites supporting wintering or passage refuelling populations, of any size, of species marked with an A in Table 10
- sites supporting a predetermined number (to be agreed by the LBAP partnerships) of those species that are marked B in Tables 9 & 10, 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 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 9. Breeding Birds of Conservation Significance in Gwent, Glamorgan and Carmarthenshire**

| Species | National status | | | Local Status<br>**A** = Designates<br>B = Contributes |
|---|---|---|---|---|
| | W&CA 1 | Red/Amber | Section 74 | |
| Avocet | X | | | **A** |
| Bunting, Corn | | R | X | **A** |
| Buzzard, Honey | | A | | **A** |
| Chough | X | A | X | **A** |
| Cormorant | | A | | **A** |
| Curlew | | R | X | **A** |
| Dove, Turtle | | R | X | **A** |
| Egret, Little | | A | | **A** |
| Falcon, Peregrine | X | A | | **A** |
| Firecrest | X | A | | **A** |
| Gadwall | | A | | **A** |
| Garganey | X | A | | **A** |
| Grouse, Red | | R | | **A** |
| Gull, Black-headed | | A | | **A** |
| Gull, Great Black-backed | | A | | **A** |
| Harrier, Hen | X | R | X | **A** |
| Hobby | X | A | | **A** |
| Kite, Red | | A | | **A** |
| Kittiwake | | A | | **A** |
| Lapwing | | R | X | **A** |
| Merlin | X | A | | **A** |
| Nightjar | | A | X | **A** |
| Ouzel, Ring | | R | | **A** |
| Owl, Long-eared | | A | | **A** |
| Owl, Short-eared | | A | | **A** |
| Partridge, Grey | | R | X | **A** |
| Plover, Golden | | R | X | **A** |
| Plover, Little-ringed | X | - | | **A** |
| Plover, Ringed | | R | | **A** |
| Rail, Water | | A | | **A** |
| Redshank | | A | | **A** |
| Shelduck | | A | | **A** |
| Shoveler | | A | | **A** |
| Snipe, Common | | A | | **A** |
| Sparrow, Tree | | R | X | **A** |
| Teal, Eurasian | | A | | **A** |
| Tit, Marsh | | R | | **A** |
| Tit, Willow | | R | | **A** |
| Wagtail, Yellow | | A | | **A** |
| Warbler, Cetti's | X | - | | **A** |
| Warbler, Dartford | X | A | | **A** |
| Woodpecker, Lesser-spotted | | R | | **A** |
| Yellowhammer | | R | X | **A** |
| | | | | |
| Bullfinch | | R | X | B |
| Bunting, Reed | | A | X | B |
| Crossbill, Common | X | - | | B |
| Dove, Stock | | A | | B |
| Flycatcher, Spotted | | A | X | B |
| Goshawk | X | | | B |
| Gull, Herring | | A | | B |
| Gull, Lesser black-backed | | A | | B |

| Species | National status | | | Local Status<br>**A** = Designates<br>B = Contributes |
|---|---|---|---|---|
| | **W&CA 1** | **Red/Amber** | **Section 74** | |
| Kestrel | | A | | B |
| Kingfisher | X | A | | B |
| Linnet | | A | X | B |
| Martin, Sand | | A | | B |
| Owl, Barn | X | A | | B |
| Oystercatcher | | A | | B |
| Pintail | | A | | B |
| Redstart | | A | | B |
| Skylark | | A | X | B |
| Sparrow, House | | A | | B |
| Starling | | R | | B |
| Stonechat | | A | | B |
| Thrush, Song | | A | X | B |
| Warbler, Grasshopper | | R | | B |
| Woodcock | | A | | B |
| Woodpecker, Green | | A | | B |

W&CA1 : Wildlife & Countryside Act 1981, Sch 1
Red/Amber : Red List (High Concern); Amber List (Medium Concern) Thorpe, R.I. & Young, A (2003)
Sec 74 : WAG's Section 74 List of 'Species and Habitats of Principle Importance for the Conservation of Biodiversity in Wales'

**Table 10. Wintering and Passage Birds of Conservation Significance in Gwent, Glamorgan and Carmarthenshire**

| Species | National Status | | | Local Status<br>**A** = Designates<br>B = Contributes |
|---|---|---|---|---|
| | W&CA 1 | Red/Amber | Section 74 | |
| Avocet | X | | | **A** |
| Bittern | | R | | **A** |
| Bunting, Corn | | R | | **A** |
| Chough | X | A | | **A** |
| Dove, Turtle | | R | | **A** |
| Egret, Little | | A | | **A** |
| Grouse, Red | | R | | **A** |
| Harrier, Marsh | X | - | | **A** |
| Harrier, Hen | X | R | | **A** |
| Owl, Long-eared | | A | | **A** |
| Owl, Short-eared | | A | | **A** |
| Partridge, Grey | | R | X | **A** |
| Rail, Water | | A | | **A** |
| Sparrow, Tree | | R | X | **A** |
| Swan, Bewick's | | A | | **A** |
| Tern, Little | | R | | **A** |
| Tit, Bearded | X | - | | **A** |
| Warbler, Aquatic | | - | X | **A** |
| Warbler, Cetti's | X | - | | **A** |
| Warbler, Dartford | X | A | | **A** |
| | | | | |
| Bullfinch | | R | X | B |
| Bunting, Reed | | A | X | B |
| Cormorant, Great (roosts) | | A | | B |
| Curlew | | R | | B |
| Diver, Red-throated | | A | | B |
| Dove, Stock | | A | | B |
| Dunlin | | A | | B |
| Falcon, Peregrine | X | A | | B |
| Firecrest | X | A | | B |
| Gadwall | | A | | B |
| Godwit, Bar-tailed | | R | | B |
| Godwit, Black-tailed | | A | | B |
| Goose, Brent | | A | | B |
| Goose, White-fronted | | R | | B |
| Gull, Great Black-backed | | A | | B |
| Kestrel | | A | | B |
| Kingfisher | X | A | | B |
| Knot | | R | | B |
| Lapwing | | R | | B |
| Linnet | | A | X | B |
| Merlin | X | A | | B |
| Owl, Barn | X | A | | B |
| Oystercatcher | | A | | B |
| Pintail | | A | | B |
| Plover, Golden | | R | | B |
| Plover, Grey | | A | | B |
| Plover, Ringed | | R | | B |
| Redshank | | A | | B |
| Scaup | | A | | B |
| Scoter, Common | | A | | B |

| Species | National Status | | | Local Status<br>**A** = Designates<br>B = Contributes |
|---|---|---|---|---|
| | **W&CA 1** | **Red/Amber** | **Section 74** | |
| Shelduck | | A | | B |
| Shoveler | | A | | B |
| Skylark | | A | X | B |
| Snipe, Common | | A | | B |
| Sparrow, House | | A | | B |
| Starling (roosts) | | R | | B |
| Stonechat | | A | | B |
| Teal, Eurasian | | A | | B |
| Tern, Arctic | | A | | B |
| Tern, Common | | A | | B |
| Tern, Sandwich | | A | | B |
| Thrush, Song | | A | X | B |
| Tit, Marsh | | R | | B |
| Tit, Willow | | R | | B |
| Turnstone | | A | | B |
| Wagtail, Yellow | | A | | B |
| Whimbrel | | A | | B |
| Wigeon | | A | | B |
| Woodcock | | A | | B |
| Woodpecker, Green | | A | | B |
| Woodpecker, Lesser-spotted | | R | | B |
| Yellowhammer | | R | X | B |

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

Red/Amber : Red List (High Concern); Amber List (Medium Concern) Thorpe, R.I. & Young, A (2003)

Sec 74 : WAG's Section 74 List of 'Species and Habitats of Principle Importance for the Conservation of Biodiversity in Wales'

## S3) REPTILES

Four species of reptile occur in South Wales (Arnold 1995) all of which are partially protected under Schedule 5 of the Wildlife & Countryside Act 1981. These are slow-worm, common lizard, adder and grass snake. The UK's two rarest reptile species (smooth snake and sand lizard) do not occur in South Wales.

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).

***Context***
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.

## S4) AMPHIBIANS

Five species of amphibian occur in South Wales (only four in Carmarthenshire) (Arnold 1995). These are common frog, common toad, smooth newt and palmate newt. Great crested newt occurs in Gwent and Glamorgan only. Of these, only great crested newt is listed as fully protected under Schedule 5 of the Wildlife & Countryside Act 1981. The UK's rarest amphibian (natterjack toad) does not occur in South Wales.

General Guidelines
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.

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.

***Context***
The SSSI criteria suggest selection of sites which have an 'amphibian score' of 5 or more, which in South Wales would require either the presence of great crested newt or 'good' or 'exceptional' populations of two or more other species. 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).

## Great Crested Newts

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

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).

***Context***

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.

## S5) FISH

About 38 native fish species occur in Britain, including estuarine and inshore species, two of which (burbot and houting) are probably now extinct. Of these about 28 species occur in South Wales. 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 South Wales (based on Grice 1994; Maitland & Campbell 1992):

Table 11. Freshwater fish of conservation significance in South Wales (provisional)

| Species | Type | Sec 74 | W&CA | IUCN | Bern | EC | BAP |
|---|---|---|---|---|---|---|---|
| **Nationally/Internationally significant** | | | | | | | |
| Sea Lamprey | Ea | | | | X | X | |
| River Lamprey | Ea | | | | X | X | |
| Brook Lamprey | E | | | | X | X | |
| Sturgeon | Ea | | X | X | X | X | X |
| Allis Shad | Ea | X | X | | X | X | X |
| Twaite Shad | Ea | X | | | X | X | X |
| Atlantic Salmon | Ea | | | | X | X | |
| Grayling | S | | | | X | | |
| Common Goby | E | | | | | | |
| Bullhead | S | | | | | X | |
| **Regionally significant** | | | | | | | |
| Bleak | S | | | | | | |
| Smelt | Ea | | | | | | |
| Brown Trout | S | | | | | | |
| Sea Trout (Sewin) | Ea | | | | | | |

Type : E = Euryhaline (lives in both salt and freshwater)
S = Stenohaline (freshwater only)
a = Anadromous (matures in sea, migrates into freshwater to spawn)
Sec 74 : Section 74 'List of Species and Habitats of Principle Importance' (WAG 2003)
W&CA : Wildlife & Countryside Act Sch 5 (fully protected)
IUCN : IUCN Red Data Book, 'Endangered'
Bern : Bern Convention Sch III; Migratory species requiring conservation
EC : European Habitats Directive (1992) Sch II or IV; Species requiring conservation
BAP : UK Biodiversity Action Plan 'Priority Species'

The following should be considered for selection:

- waterbodies supporting resident populations of any species listed in Table 11 above
- watercourses regularly used as migratory routes by anadromous species listed in Table 11 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. Dace, common bream and chub are all restricted to the east of South Wales, but would be significant if found naturally occurring in Carmarthenshire.

## S6) 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 experts 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 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 a species, which is listed in the UK Red Data Book, or the "Section 74 List" (WAG 2003).

- 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 support 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.**

### *Lepidoptera* (Butterflies and Moths)

### 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.**

The following should be considered for selection:

- any site which supports a species which fulfils the criteria for a High Priority Species (in Britain or Wales) in Butterfly Conservation's *National Action Plan for Wales* (1998). These species form list 'A' in Table 12a (see below).

- sites which support significant populations or assemblages of species which fulfil the criteria for Medium Priority Species (in Britain or Wales) in Butterfly Conservation's *National Action Plan for Wales* (1998). These species form list 'B' in Table 12a (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 12a. Butterflies of conservation significance**

| List 'A' | List 'B' |
|---|---|
| **Grizzled Skipper (*Pyrgus malvae)*** | Dingy Skipper (*Erynnis tages)* |
| Brown Hairstreak (*Thecla betulae)* | Wood White (*Lepidea sinapsis)* |
| **Silver-studded Blue (*Plebius argus)*** | White-letter Hairstreak (*Satyrium w-album)* |
| **Small Blue (*Cupido minimus)*** | Silver-washed Fritillary (*Argynnis paphia)* |
| High Brown Fritillary (*Argynnis adippe)* | Dark Green Fritillary (*Argynnis aglaja)* |
| Marsh Fritillary (*Euphydryas aurinia)* | Small Pearl-bordered Fritillary (*Bolaria selene)* |
| Pearl-bordered Fritillary (*Bolaria euphrosyne)* | Grayling (*Hipparchia semele)* |

### Moths

**The following guidelines apply to macro-moths. Micro-moths should be considered under the General Invertebrate Guidelines. There is a considerable volume of data on moths, especially in Glamorgan. 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:

- any site which supports a species which fulfils the criteria for a High Priority Species (in Britain or Wales) in Butterfly Conservation's *National Action Plan for Wales* (1998). These species are listed in Table 12b (see below).

- sites which support significant populations or assemblages of species which fulfil the criteria for Medium Priority Species (in Britain or Wales) in Butterfly Conservation's *National Action Plan for Wales* (1998), or are considered to be of conservation importance in South-east Wales. These species are listed in the Appendix (Glamorgan Moth Recording Group 2003) and are based on status within Glamorgan VC 41. 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 Butterfly Conservation and the appropriate Vice-County recorders.

**Table 12b. Macro-moths of conservation significance**

| |
|---|
| Welsh Clearwing (*Synanthedon scoliaeformis)* |
| Silky Wave (*Idaea dilutaria)* |
| Belted Beauty (*Lycia zonaria)* |
| White-spotted Pinion (*Cosmia diffinis)* |
| The Silurian (*Eriopygodes imbecilla)* |
| Orange Upperwing (*Jodia croceago)* |

***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.

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 13 (see below)

- sites which support significant populations or assemblages of species in list 'B' of Table 13 (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 13. Dragonflies and Damselflies of conservation significance

| List 'A' | List 'B' |
|---|---|
| White-legged Damselfly (*Platycnemis pennipes)* | Beautiful Demoiselle (*Calopteryx virgo)* |
| Small Red Damselfly (*Ceriagrion tenellum)* | Banded Demoiselle (*Calopteryx splendens)* |
| Southern Damselfly (*Coenagrion mercuriale)* | Emerald Damselfly (*Lestes sponsa)* |
| Variable Damselfly (*Coenagrion pulchellum)* | Scarce Blue-tailed Damselfly (*Ischnura pumilio)* |
| Red-eyed Damselfly (*Erythromma najas)* | Brown Hawker (*Aeshna grandis)* |

| List 'A' | List 'B' |
|---|---|
| Hairy Dragonfly (*Brachytron pratense)* | Golden-ringed Dragonfly (*Cordulegaster boltonii)* |
| Club-tailed Dragonfly (*Gomphus vulgatissimus)* | Black-tailed Skimmer (*Orthetrum cancellatum)* |
| Downy Emerald (*Cordulia aenea)* | Black Darter (*Sympetrum danae)* |
| Ruddy Darter (*Sympetrum sanguineum)* | |
| Keeled Skimmer (*Orthetrum coerulescens)* | |

### *Orthoptera* (Grasshoppers and allied insects)

Some species are probably under-recorded in South Wales and others are currently expanding their range. It will therefore be necessary to review the status of some species in the light of new data in the future.

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 14 (see below).
- sites which support significant populations or assemblages of species in list 'B' of Table 14 (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 14. Grasshoppers and allied insects of conservation significance

| List 'A' | List 'B' |
|---|---|
| Great Green Bushcricket (*Tettigonia viridissima)* | Oak Bushcricket (*Meconaema thalassinum)* |
| Grey Bushcricket (*Platycleis albopunctata)* | Short-winged Conehead (*Conocephalus dorsalis)* |
| Bog Bushcricket (*Metrioptera brachyptera)* | Speckled Bushcricket (*Leptophytes punctatissima)* |
| Roesel's Bushcricket (*Metrioptera roeseli)* | Slender Groundhopper (*Tetrix subulata)* |
| Long-winged Conehead (*Conocephalus discolor)* | Lesser Marsh Grasshopper (*Chorthipus albomarginatus)* |
| House Cricket (*Acheta domesticus)* | Mottled Grasshopper (*Myrmeleotettix maculates)* |
| Scaly Cricket (*Pseudomogoplistes squamiger)* | Lesne's Earwig (*Forficula lesnei)* |
| Cepero's Groundhopper (*Tetrix ceperoi)* | |
| Tawny Cockroach (*Ectobius pallidus)* | |

## S7) VASCULAR PLANTS

A great many rare and notable plant species have been recorded at various times, often as casuals or introduced aliens occuring, for example, in the docks area of Barry, Cardiff and Newport or on former tips and industrial sites. In other cases plants which are known to be rare natives elewhere in the UK have been deliberately planted or otherwise introduced in the past, particularly in popular woodland sites.

Tables 15 & 16 have been drawn from the New Atlas of the British and Irish Flora (2002). Two lists have been composed, the first is a primary list containing species that are recorded in 15 or fewer 10 km squares (mostly). The second, a contributory list, contains species recorded in 30 or fewer 10km squares. There are 371 primary species and 218 contributory species. Some subjective judgement was made so that declining species within UK and Europe were also included. All of the listed species are native or archeophytes and most were recorded in the most recent time period, 1987-1999. A site in this context can be considered as a 'Wells site' i.e any movable 1km square.

On this basis the following should be considered for selection;

- any site with one or more primary species present
- any site with 5 or more contributory species present
- any site that supports a species listed in either the Red Data Books (NCC, 1987) or the "Section 74 List" (WAG 2003), or is recorded as Nationally Scarce
- any 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.

***Context***

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 lists fit into one or more of these categories. Many though can be loosely considered as locally or regionally rare. No attempt was made to try to categorise all the species listed due to the amount of time this would take.

The 'total 10km square' column refers to the total number of squares a species has been recorded in the South Wales area (Monmouthshire VC35, Glamorgan VC41 and Carmarthenshire VC44). The status column refers to the categories used in the 'New Atlas of the British & Irish Flora' (Preston *et al*, 2002) to define whether a plant is native in that locality.

## Table 15. Rare, scarce & declining species in Monmouthshire, Glamorgan and Carmarthenshire

| Primary species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Aconitum napellus sens. lat.* (monk's hood) | 1987-1999 | Native | 15 |
| *Adiantum capillus-veneris* (maidenhair fern) | 1987-1999 | Native | 5 |
| *Agrostemma githago* (corncockle) | 1987-1999 | Alien | 1 |
| *Agrostis curtisii* (bristle bent) | 1987-1999 | Native | 13 |
| *Alchemilla filicaulis subsp. filicaulis* (Ladies mantle) | 1987-1999 | Native | 5 |
| *Alisma lanceolatum* (narrow-leaved water-plantain) | 1987-1999 | Native | 13 |
| *Allium ampeloprasum* (wild leek) | 1987-1999 | Alien | 1 |
| *Allium schoenoprasum* (chives) | 1987-1999 | Native | 1 |
| *Alopecurus aequalis* (orange foxtail) | 1987-1999 | Native | 5 |
| *Alopecurus bulbosus* (bulbous foxtail) | 1987-1999 | Native | 14 |
| *Althaea hirsuta* (rough marsh mallow) | 1987-1999 | Alien | 1 |
| *Anagallis arvensis subsp. foemina* (blue pimpernel) | 1987-1999 | Alien | 2 |
| *Anagallis minima* (chaffweed) | 1987-1999 | Native | 2 |
| *Andromeda polifolia* (bog rosemary) | 1987-1999 | Native | 4 |
| *Antennaria dioica* (mountain everlasting) | 1987-1999 | Native | 6 |
| *Anthemis arvensis* (corn chamomile) | 1987-1999 | Alien | 2 |
| *Anthriscus caucalis* (bur-chervil) | 1987-1999 | Native | 3 |
| *Arabis glabra* (Tower mustard) | Pre-1970 | Native | 1 |
| *Artemisia campestris* (Field wormwood) | 1987-1999 | Alien | 1 |
| *Arum italicum subsp. neglectum* (Italian cuckoopint) | 1987-1999 | Native | 1 |
| *Asparagus officinalis subsp. prostratus* | 1987-1999 | Native | 2 |
| *Asperula cynanchica* (squinancywort) | 1987-1999 | Native | 13 |
| *Asplenium obovatum* (lanceolate spleewort) | 1987-1999 | Native | 2 |
| *Asplenium viride* (green spleenwort) | 1987-1999 | Native | 12 |
| *Aster linosyris* (goldilocks aster) | 1987-1999 | Native | 1 |
| *Astragalus glycophyllos* (wild liquorice) | 1987-1999 | Native | 5 |
| *Atriplex longipes* (long-stalked orache) | 1987-1999 | Native | 6 |
| *Atropa belladonna* (deadly nightshade) | 1987-1999 | Native | 2 |
| *Baldellia ranunculoides* (lesser water-plantain) | 1987-1999 | Native | 8 |
| *Blysmus compressus* (flat sedge) | 1987-1999 | Native | 1 |
| *Blysmus rufus* (saltmarsh flat sedge) | 1987-1999 | Native | 1 |
| *Brachypodium pinnatum* (tor-grass) | 1987-1999 | Native | 6 |
| *Brassica oleracea* (wild cabbage) | 1987-1999 | Native | 8 |
| *Bromus hordeaceus subsp. ferronii* (soft brome) | 1987-1999 | Native | 7 |
| *Bromus hordeaceus subsp. thominei* (soft brome) | 1987-1999 | Native | 5 |
| *Bromus hordeaceus x B. lepidus* (soft brome) | 1987-1999 | Alien | 9 |
| *Bromus secalinus* (rye brome) | 1987-1999 | Alien | 3 |
| *Bupleurum tenuissimum* (slender hare's-ear) | 1987-1999 | Native | 5 |
| *Butomus umbellatus* (flowering rush) | 1987-1999 | Native | 9 |
| *Callitriche brutia* (pedunculate water-starwort) | 1987-1999 | Native | 11 |
| *Campanula glomerata* (clustered bellflower) | 1987-1999 | Native | 3 |
| *Campanula latifolia* (giant bellflower) | 1987-1999 | Native | 12 |
| *Campanula patula* (spreading bellflower) | 1987-1999 | Native | 7 |
| *Campanula trachelium* (nettle-leaved bellflower) | 1987-1999 | Native | 11 |
| *Carex acuta* (slender tufted-sedge) | 1987-1999 | Native | 7 |
| *Carex aquatilis* (water sedge) | 1987-1999 | Native | 6 |
| *Carex diandra* (lesser tussock sedge) | Pre-1970 | Native | 2 |
| *Carex digitata* (fingered sedge) | 1987-1999 | Native | 3 |
| *Carex dioica* (dioecious sedge) | 1987-1999 | Native | 7 |
| *Carex distans* (distant sedge) | 1987-1999 | Native | 11 |
| *Carex divisa* (divided sedge) | 1987-1999 | Native | 1 |
| *Carex divulsa subsp. leersii* (grey sedge) | 1987-1999 | Native | 3 |
| *Carex elata* (tufted sedge) | 1987-1999 | Native | 3 |

| Primary species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Carex elongata* (elongated sedge) | 1987-1999 | Native | 1 |
| *Carex humilis* (dwarf sedge) | 1987-1999 | Native | 1 |
| *Carex lasiocarpa* (slender sedge) | 1987-1999 | Native | 1 |
| *Carex limosa* (bog sedge) | 1987-1999 | Native | 2 |
| *Carex punctata* (dotted sedge) | 1987-1999 | Native | 3 |
| *Carex rostrata x C. vesicaria* (bottle sedge) | 1987-1999 | Native | 2 |
| *Carex viridula subsp. viridula* (small fruited yellow sedge) | 1987-1999 | Native | 8 |
| *Catabrosa aquatica* (whorl-grass) | 1987-1999 | Native | 9 |
| *Centaurium littorale* (seaside centaury) | 1987-1999 | Native | 4 |
| *Cephalanthera damasonium* (white helleborine) | 1987-1999 | Native | 2 |
| *Cephalanthera longifolia* (narrow-leaved helleborine) | 1987-1999 | Native | 1 |
| *Ceratophyllum submersum* (soft hornwort) | 1987-1999 | Native | 8 |
| *Chamaemelum nobile* (chamomile) | 1987-1999 | Native | 3 |
| *Chenopodium glaucum* (oak-leaved goosefoot) | 1987-1999 | Alien | 1 |
| *Chenopodium hybridum* (maple-leaved goosefoot) | 1987-1999 | Alien | 3 |
| *Chenopodium murale* (nettle-leaved goosefoot) | 1987-1999 | Alien | 3 |
| *Circaea alpina* (alpine enchanters-nightshade) | 1987-1999 | Native | 1 |
| *Cirsium tuberosum* (tuberous thistle) | 1987-1999 | Native | 3 |
| *Cladium mariscus* (great fen-sedge) | 1987-1999 | Native | 3 |
| *Clinopodium acinos* (basil thyme) | 1987-1999 | Native | 6 |
| *Clinopodium ascendens* (common calamint) | 1987-1999 | Native | 12 |
| *Clinopodium calamintha* (lesser calamint) | 1987-1999 | Native | 3 |
| *Coeloglossum viride* (frog orchid) | 1987-1999 | Native | 6 |
| *Coincya monensis subsp. monensis* (Isle of Man cabbage) | 1987-1999 | Native | 2 |
| *Colchicum autumnale* (meadow saffron) | 1987-1999 | Native | 12 |
| *Convallaria majalis* (lily-of-the-valley) | 1987-1999 | Native | 9 |
| *Crataegus laevigata* (Midland hawthorn) | 1987-1999 | Native | 1 |
| *Crepis biennis* (rough hawk's-bit) | 1987-1999 | Native | 1 |
| *Crepis paludosa* (marsh hawk's-beard) | 1987-1999 | Native | 4 |
| *Cryptogramma crispa* (parsley fern) | 1987-1999 | Native | 7 |
| *Cuscuta epithymum* (dodder) | Pre-1970 | Native | 5 |
| *Cynoglossum germanicum* (green hound's-tongue) | Pre-1970 | Native | 2 |
| *Cynoglossum officinale* (hound's tongue) | 1987-1999 | Native | 13 |
| *Cyperus longus* (galingale) | 1987-1999 | Native | 1 |
| *Daphne mezereum* (mezereon) | 1987-1999 | Native | 2 |
| *Descurainia sophia* (flixweed) | 1987-1999 | Alien | 3 |
| *Dianthus armeria* (Deptford pink) | 1987-1999 | Native | 3 |
| *Diphasiastrum alpinum* (alpine club-moss) | 1987-1999 | Native | 2 |
| *Dipsacus pilosus* (small teasel) | 1987-1999 | Native | 8 |
| *Draba aizoides* (yellow whitlowgrass) | 1987-1999 | Native | 2 |
| *Drosera anglica* (great sundew) | Pre-1970 | Native | 1 |
| *Drosera intermedia* (oblong-leaved sundew) | 1987-1999 | Native | 6 |
| *Dryopteris aemula* (hay-scented buckler-fern) | 1987-1999 | Native | 12 |
| *Dryopteris expansa* (northern buckler-fern) | 1970-1986 | Native | 1 |
| *Dryopteris oreades* (mountain male-fern) | 1987-1999 | Native | 5 |
| *Dryopteris submontana* (rigid buckler-fern) | 1970-1986 | Native | 1 |
| *Elatine hexandra* (six-stamened waterwort) | 1987-1999 | Native | 4 |
| *Eleocharis acicularis* (needle spike rush) | 1970-1986 | Native | 1 |
| *Eleocharis uniglumis* (slender spike-rush) | 1987-1999 | Native | 16 |
| *Epilobium montanum x E. obscurum* | 1987-1999 | Native | 1 |
| *Epilobium montanum x E. parviflorum* | 1987-1999 | Native | 1 |
| *Epipactis leptochila* (narrow-lipped helleborine) | 1987-1999 | Native | 2 |
| *Epipactis phyllanthes* (green-flowered helleborine) | 1987-1999 | Native | 3 |
| *Equisetum arvense x E. fluviatile* | 1987-1999 | Native | 9 |
| *Equisetum hyemale* (rough horsetail) | 1987-1999 | Native | 7 |
| *Eriophorum gracile* (slender cotton-sedge) | 1987-1999 | Native | 2 |

| Primary species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Eriophorum latifolium* (broad-leaved cotton-sedge) | 1987-1999 | Native | 14 |
| *Erodium lebelii* (sticky stork's bill) | 1987-1999 | Native | 4 |
| *Erodium moschatum* (musk stork's-bill) | 1987-1999 | Alien | 7 |
| *Erophila glabrescens* (whitlow grass) | 1987-1999 | Native | 6 |
| *Erophila majuscula* (hairy whitlow grass) | 1987-1999 | Native | 2 |
| *Erysimum cheiranthoides* (treacle mustard) | 1987-1999 | Alien | 11 |
| *Euphorbia platyphyllos* (broad-leaved spurge) | 1970-1986 | Alien | 2 |
| *Euphorbia serrulata* (upright spurge) | 1987-1999 | Native | 6 |
| *Euphrasia arctica x E. confusa* | 1987-1999 | Native | 2 |
| *Euphrasia confusa x E. nemorosa* | 1987-1999 | Native | 12 |
| *Euphrasia confusa x E. scottica* | 1987-1999 | Native | 5 |
| *Euphrasia micrantha* (an eyebright) | 1987-1999 | Native | 5 |
| *Euphrasia pseudokerneri* (an eyebright) | 1987-1999 | Native | 1 |
| *Euphrasia rostkoviana subsp. Montana* (an eyebright) | 1987-1999 | Native | 2 |
| *Euphrasia scottica* (an eyebright) | 1987-1999 | Native | 5 |
| *Euphrasia tetraquetra* (an eyebright) | 1987-1999 | Native | 11 |
| *Festuca altissima* (wood fescue) | 1987-1999 | Native | 6 |
| *Festuca arenaria* (rush-leaved fescue) | 1987-1999 | Native | 3 |
| *Festuca filiformis* (fine-leaved sheep's-fescue) | 1987-1999 | Native | 3 |
| *Festuca lemanii* (confused fescue) | 1987-1999 | Native | 1 |
| *Festuca vivipara* (viviparous sheep's-fescue) | 1987-1999 | Native | 1 |
| *Filago vulgaris* (common cudweed) | 1987-1999 | Native | 9 |
| *Filipendula vulgaris* (dropwort) | 1987-1999 | Native | 3 |
| *Frankenia laevis* (sea-heath) | 1987-1999 | Alien | 2 |
| *Fumaria purpurea* (purple ramping-fumitory) | 1987-1999 | Native | 1 |
| *Fumaria vaillantii* (few flowered fumitory) | 1987-1999 | Alien | 1 |
| *Gagea lutea* (yellow star-of-Bethlehem) | 1987-1999 | Native | 1 |
| *Galeopsis angustifolia* (narrow-leaved hemp-nettle) | 1987-1999 | Alien | 2 |
| *Galium mollugo x G. verum* | 1987-1999 | Native | 1 |
| *Galium parisiense* (wall bedstraw) | Pre-1970 | Native | 1 |
| *Galium sterneri* (limestone bedstraw) | 1987-1999 | Native | 6 |
| *Gastridium ventricosum* (nit-grass) | 1987-1999 | Native | 3 |
| *Gaudinia fragilis* (French oat-grass) | 1987-1999 | Native | 1 |
| *Genista pilosa* (hairy greenweed) | 1987-1999 | Native | 1 |
| *Gentianella anglica* (early gentian) | Pre-1970 | Native | 1 |
| *Gentianella campestris* (field gentian) | 1970-1986 | Native | 1 |
| *Gentianella uliginosa* (dune gentian) | 1987-1999 | Native | 4 |
| *Geranium purpureum* (little robin) | Pre-1970 | Native | 2 |
| *Geranium sanguineum* (bloody crane's-bill) | 1987-1999 | Native | 11 |
| *Geranium sylvaticum* (wood crane's-bill) | 1987-1999 | Alien | 2 |
| *Geum rivale x G. urbanum* | 1987-1999 | Native | 14 |
| *Gnaphalium sylvaticum* (heath cudweed) | 1987-1999 | Native | 2 |
| *Groenlandia densa* (opposite-leaved pondweed) | 1970-1986? | Native | 2 |
| *Gymnocarpium robertianum* (limestone fern) | 1987-1999 | Native | 8 |
| *Hammarbya paludosa* (bog orchid) | 1987-1999 | Native | 2 |
| *Helianthemum oelandicum* (hoary rock-rose) | 1987-1999 | Native | 4 |
| *Helictotrichon pratense* (meadow oat-grass) | 1987-1999 | Native | 7 |
| *Herminium monorchis* (musk orchid) | Pre-1970 | Native | 2 |
| *Hieracium radycense* (Radyr hawkweed) | 1987-1999 | Native | 1 |
| *Hippocrepis comosa* (horseshoe vetch) | 1987-1999 | Native | 7 |
| *Hordelymus europaeus* (wood barley) | 1987-1999 | Native | 4 |
| *Hordeum marinum* (sea barley) | 1987-1999 | Native | 6 |
| *Hornungia petraea* (hutchinsia) | 1987-1999 | Native | 11 |
| *Hottonia palustris* (water violet) | 1987-1999 | Native | 1 |
| *Huperzia selago* (fir clubmoss) | 1987-1999 | Native | 12 |
| *Hydrocharis morsus-ranae* (frogbit) | 1987-1999 | Native | 8 |

| Primary species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Hymenophyllum tunbrigense* (Tonbridge filmy-fern) | 1987-1999 | Native | 5 |
| *Hymenophyllum wilsonii* (Wilson's filmy-fern) | 1987-1999 | Native | 11 |
| *Hyoscyamus niger* (henbane) | 1987-1999 | Alien | 8 |
| *Hypericum montanum* (pale St John's-wort) | 1987-1999 | Native | 8 |
| *Hypochoeris glabra* (smooth cat's-ear) | 1987-1999 | Native | 3 |
| *Isoetes lacustris* (quillwort) | 1987-1999 | Native | 2 |
| *Juncus ambiguus* (frog rush) | 1987-1999 | Native | 6 |
| *Juncus compressus* (round-fruited rush) | 1987-1999 | Native | 2 |
| *Juniperus communis* (common juniper) | 1987-1999 | Native | 3 |
| *Kickxia spuria* (round-leaved fluellen) | 1987-1999 | Alien | 5 |
| *Lactuca virosa* (great lettuce) | 1987-1999 | Native | 9 |
| *Lathyrus aphaca* (yellow vetchling) | Pre-1970 | Native | 1 |
| *Lathyrus japonicus* (sea pea) | Pre-1970 | Native | 1 |
| *Lathyrus palustris* (marsh pea) | 1987-1999 | Native | 2 |
| *Lepidium latifolium* (dittander) | 1987-1999 | Native | 1 |
| *Limonium humile* (lax-flowered sea lavender) | 1987-1999 | Native | 1 |
| *Limonium procerum subsp. Procerum* (rock sea lavender) | 1987-1999 | Native | 1 |
| *Limosella aquatica* (mudwort) | Pre-1970 | Native | 4 |
| *Limosella australis* (Welsh mudwort) | Pre-1970 | Native | 1 |
| *Liparis loeselii* (fen orchid) | 1987-1999 | Native | 4 |
| *Lithospermum arvense* (field gromwell) | 1987-1999 | Alien | 2 |
| *Lithospermum purpurocaeruleum* (purple gromwell) | 1987-1999 | Native | 3 |
| *Lobelia dortmanna* (water lobelia) | 1987-1999 | Native | 1 |
| *Lobelia urens* (heath lobelia) | Pre-1970 | Native | 1 |
| *Lolium temulentum* (darnel) | 1987-1999 | Alien | 3 |
| *Lotus glaber* (narrow-leaved bird's-foot trefoil) | 1987-1999 | Native | 5 |
| *Luronium natans* (floating water-plantain) | 1970-1986 | Native | 1 |
| *Luzula forsteri* (southern wood rush) | 1987-1999 | Native | 9 |
| *Luzula forsteri x L. pilosa* | 1987-1999 | Native | 1 |
| *Lycopodium clavatum* (stag's-horn club-moss) | 1987-1999 | Native | 6 |
| *Lysimachia thryssifolia* (tufted loosestrife) | 1987-1999 | Native? | 1 |
| *Lythrum hyssopifolia* (grass-poly) | 1987-1999 | Alien | 1 |
| *Marrubium vulgare* (white horehound) | 1987-1999 | Native | 6 |
| *Matthiola sinuata* (sea stock) | 1987-1999 | Native | 6 |
| *Mecanopsis cambrica* (Welsh poppy) | 1987-1999 | Native | 7 |
| *Medicago polymorpha* (toothed medick) | 1987-1999 | Native | 1 |
| *Melica nutans* (mountain melic) | 1987-1999 | Native | 6 |
| *Melittis melissophyllum* (bastard balm) | 1987-1999 | Native | 2 |
| *Mentha pulegium* (pennyroyal) | 1987-1999 | Alien | 3 |
| *Mibora minima* (early sand-grass) | 1987-1999 | Native | 1 |
| *Minuartia hybrida* (fine-leaved sandwort) | 1987-1999 | Native | 1 |
| *Misopates orontium* (weasel's-snout) | 1987-1999 | Alien | 8 |
| *Moenchia erecta* (upright chickweed) | 1987-1999 | Native | 7 |
| *Monotropa hypopitys* (yellow bird's-nest) | 1987-1999 | Native | 8 |
| *Myrica gale* (bog myrtle) | 1987-1999 | Native | 12 |
| *Myriophyllum verticillatum* (whorled water-milfoil) | 1987-1999 | Native | 1 |
| *Oenanthe aquatica* (fine-leaved water-dropwort) | 1987-1999 | Native | 9 |
| *Oenanthe pimpinelloides* (corky-fruited water-dropwort) | 1987-1999 | Native | 1 |
| *Ononis reclinata* (small restharrow) | 1987-1999 | Native | 2 |
| *Ophrys insectifera* (fly orchid) | 1987-1999 | Native | 1 |
| *Orchis ustulata* (burnt orchid) | 1987-1999 | Native | 1 |
| *Ornithogalum pyranaicum* (spiked star-of-Bethlehem) | 1987-1999 | Alien | 1 |
| *Orobanche elatior* (knapweed broomrape) | Pre-1970 | Native | 5 |
| *Orobanche purpurea* (yarrow broomrape) | Pre-1970 | Native | 1 |
| *Orobanche rapum-genistae* (greater broomrape) | 1987-1999 | Native | 9 |
| *Orthilia secunda* (serrated wintergreen) | Pre-1970 | Native | 2 |

| Primary species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Paeonia mascula* (peony) | 1987-1999 | Alien | 1 |
| *Papaver argemone* (prickly poppy) | 1987-1999 | Alien | 2 |
| *Papaver hybridum* (rough poppy) | 1987-1999 | Alien | 1 |
| *Parapholis incurva* (curved hard-grass) | 1987-1999 | Native | 1 |
| *Parentucellia viscosa* (yellow bartsia) | 1987-1999 | Native | 4 |
| *Parnassia palustris* (grass of Parnassus) | Pre-1970 | Native | 2 |
| *Persicaria minor* (small water-pepper) | 1987-1999 | Native | 3 |
| *Persicaria mitis* (tasteless water-pepper) | 1987-1999 | Native | 1 |
| *Petrorhagia nanteuilii* (childing pink) | 1987-1999 | Alien | 1 |
| *Pilularia globulifera* (pillwort) | 1987-1999 | Native | 1 |
| *Pimpinella major* (greater burnet-saxifrage) | 1970-1986 | Native | 1 |
| *Platanthera bifolia* (lesser butterfly-orchid) | 1987-1999 | Native | 16 |
| *Poa angustifolia* (narrow-leaved meadow-grass) | 1987-1999 | Native | 8 |
| *Poa bulbosa* (bulbous meadow-grass) | 1987-1999 | Native | 2 |
| *Polygonatum multiflorum* (Solomon's-seal) | 1987-1999 | Native | 12 |
| *Polygonatum odoratum* (angular Solomon's-seal) | 1987-1999 | Native | 2 |
| *Polygonum oxyspermum* (Ray's knotgrass) | 1987-1999 | Native | 6 |
| *Potamogeton alpinus* (red pondweed) | 1987-1999 | Native | 1 |
| *Potamogeton coloratus* (fen pondweed) | 1987-1999 | Native | 1 |
| *Potamogeton gramineus* (various leaved pondweed) | 1987-1999 | Native | 1 |
| *Potamogeton gramineus x P. lucens* | 1987-1999 | Native | 1 |
| *Potamogeton gramineus x P. perfoliatus* | 1987-1999 | Native | 1 |
| *Potamogeton lucens* (shining pondweed) | 1987-1999 | Native | 2 |
| *Potamogeton lucens x P. perfoliatus* | Pre-1970 | Native | 1 |
| *Potamogeton obtusifolius* (blunt-leaved pondweed) | 1987-1999 | Native | 6 |
| *Potamogeton perfoliatus* (perfoliate pondweed) | 1987-1999 | Native | 8 |
| *Potamogeton trichoides* (hairlike pondweed) | 1987-1999 | Native | 6 |
| *Potentilla argentea* (hoary cinquefoil) | 1987-1999 | Native | 1 |
| *Potentilla neumanniana* (spring cinquefoil) | 1987-1999 | Native | 3 |
| *Pseudorchis albida* (small white orchid) | 1987-1999 | Native | 1 |
| *Puccinellia fasciculata* (Borrer's saltmarsh-grass) | Pre-1970 | Native | 2 |
| *Puccinellia rupestris* (stiff saltmarsh-grass) | 1987-1999 | Native | 6 |
| *Pulicaria vulgaris* (small fleabane) | Pre-1970 | Native | 1 |
| *Pyrola minor* (common winter green) | 1987-1999 | Native | 4 |
| *Pyrus cordata* (Plymouth pear) | Pre-1970 | Native | 1 |
| *Radiola linoides* (allseed) | 1987-1999 | Native | 1 |
| *Ranunculus arvensis* (corn buttercup) | 1987-1999 | Alien | 1 |
| *Ranunculus baudotii* (brackish water crowfoot) | 1987-1999 | Native | 13 |
| *Ranunculus circinatus* (fan leaved water crowfoot) | 1987-1999 | Native | 6 |
| *Ranunculus fluitans* (river water crowfoot) | 1987-1999 | Native | 8 |
| *Ranunculus lingua* (greater spearwort) | 1987-1999 | Native | 6 |
| *Ranunculus parviflorus* (small-flowered buttercup) | 1987-1999 | Native | 10 |
| *Ranunculus penicillatus subsp.pseudofl.* | 1987-1999 | Native | 8 |
| *Ranunculus tripartitus* (three-lobed water-crowfoot) | 1987-1999 | Native | 2 |
| *Rhynchospora alba* (white beak-sedge) | 1987-1999 | Native | 12 |
| *Rhynchospora fusca* (brown beak-sedge) | Pre-1970 | Native | 1 |
| *Rorippa amphibia* (great yellow-cress) | 1987-1999 | Native | 6 |
| *Rorippa amphibia x R. sylvestris* | 1987-1999 | Native | 1 |
| *Rorippa islandica* (Northern yellow-cress) | 1987-1999 | Native | 13 |
| *Rosa arvensis x R. canina* | 1987-1999 | Native | 5 |
| *Rosa caesia subsp. Caesia* (hairy dog-rose) | 1970-1986 | Native | 2 |
| *Rosa canina x R. obtusifolia* | 1987-1999 | Native | 3 |
| *Rosa canina x R. rubiginosa* | 1987-1999 | Native | 1 |
| *Rosa canina x R. sherardii* | 1987-1999 | Native | 5 |
| *Rosa canina x R. tomentosa* | 1987-1999 | Native | 4 |
| *Rosa micrantha* (small-flowered sweet-briar) | 1987-1999 | Native | 11 |

| Primary species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Rosa mollis* (soft downy-rose) | 1987-1999 | Native | 7 |
| *Rosa obtusifolia* (round-leaved dog-rose) | 1987-1999 | Native | 1 |
| *Rosa pimpinellifolia x R. sherardii* | 1987-1999 | Native | 1 |
| *Rosa rubiginosa* (sweet briar) | 1987-1999 | Native | 7 |
| *Rosa tomentosa (*harsh downy rose) | 1987-1999 | Native | 12 |
| *Rubus saxatilis* (stone bramble) | 1987-1999 | Native | 8 |
| *Rumex maritimus* (golden dock) | 1987-1999 | Native | 2 |
| *Rumex palustris* (marsh dock) | 1987-1999 | Native | 3 |
| *Rumex pulcher* (fiddle dock) | 1987-1999 | Native | 3 |
| *Rumex rupestris* (shore dock) | 1987-1999 | Native | 1 |
| *Ruppia cirrhosa* (spiral tasselweed) | Pre-1970 | Native | 1 |
| *Ruppia maritima* (beaked tasselweed) | 1987-1999 | Native | 4 |
| *Ruscus aculeatus* (butcher's-broom) | 1987-1999 | Native | 2 |
| *Sagina subulata* (heath pearlwort) | 1987-1999 | Native | 5 |
| *Sagittaria sagittifolia* (arrowhead) | 1987-1999 | Native | 5 |
| *Salicornia europaea* (common glasswort) | 1987-1999 | Native | 7 |
| *Salicornia fragilis* (yellow glasswort) | 1987-1999 | Native | 5 |
| *Salicornia nitens* (shiny glasswort) | Pre-1970 | Native | 1 |
| *Salicornia obscura* (glaucous glasswort) | 1987-1999 | Native | 1 |
| *Salicornia pusilla* (one-flowered glasswort) | 1987-1999 | Native | 8 |
| *Salix aurita x S. repens* | 1987-1999 | Native | 1 |
| *Salix cinerea subsp.cinerea* (grey willow) | 1987-1999 | Native | 3 |
| *Salix cinerea x S.purpurea x S.viminalis* | 1987-1999 | Native | 1 |
| *Salix herbacea* (dwarf willow) | 1970-1986 | Native | 3 |
| *Salix pentandra* (bay willow) | 1987-1999 | Native | 3 |
| *Salix purpurea x S. viminalis* | 1987-1999 | Native | 1 |
| *Salvia pratensis* (meadow clary) | 1987-1999 | Native | 1 |
| *Saxifraga hypnoides* (mossy saxifrage) | 1987-1999 | Native | 11 |
| *Saxifraga oppositifolia (*purple saxifrage) | 1970-1986 | Native | 1 |
| *Scandix pecten-veneris* (shepherd's-needle) | 1987-1999 | Alien | 1 |
| *Schoenus nigricans* (black bog rush) | 1987-1999 | Native | 3 |
| *Scilla autumnalis* (Autumn squill) | Pre-1970 | Native | 1 |
| *Scirpoides holoschoenus* (round-headed club-rush) | 1987-1999 | Alien | 5 |
| *Scleranthus annuus* (annual knawel) | 1987-1999 | Native | 5 |
| *Scorzonera humilis* (viper's-grass) | 1987-1999 | Native | 2 |
| *Scrophularia umbrosa* (green figwort) | Pre-1970 | Native | 1 |
| *Sedum forsterianum* (rock stonecrop) | 1987-1999 | Native | 5 |
| *Sedum roseum* (roseroot) | 1987-1999 | Native | 3 |
| *Selaginella selaginoides* (lesser club-moss) | 1987-1999 | Native | 1 |
| *Sibthorpia europea* (Cornish moneywort) | 1987-1999 | Native | 13 |
| *Silene conica* (sand catchfly) | 1987-1999 | Native | 2 |
| *Silene gallica* (small-flowered catchfly) | 1987-1999 | Alien | 5 |
| *Silene noctiflora* (night-flowering catchfly) | 1987-1999 | Alien | 1 |
| *Silene nutans (*Nottingham catchfly) | 1987-1999 | Native | 1 |
| *Sium latifolium* (greater water-parsnip) | Pre-1970 | Native | 1 |
| *Sorbus anglica* (a whitebeam) | 1987-1999 | Native | 4 |
| *Sorbus domestica* (true service tree) | 1987-1999 | Native | 2 |
| *Sorbus eminens* (a whitebeam) | 1987-1999 | Native | 2 |
| *Sorbus leptophylla* (a whitebeam) | 1987-1999 | Native | 2 |
| *Sorbus leyana* (a whitebeam) | 1987-1999 | Native | 2 |
| *Sorbus minima* (a whitebeam) | 1987-1999 | Native | 1 |
| *Sorbus porrigentiformis* (green-leaved whitebeam) | 1987-1999 | Native | 14 |
| *Sorbus rupicola* (rock whitebeam) | 1987-1999 | Native | 5 |
| *Sparganium angustifolium* (floating bur-reed) | 1987-1999 | Native | 4 |
| *Sparganium natans* (least bur-reed) | 1987-1999 | Native | 1 |
| *Spartina alterniflora x S. maritima* | 1987-1999 | Native | 1 |

| Primary species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Spergularia rupicola* (rock sea-spurrey) | 1987-1999 | Native | 9 |
| *Stellaria nemorum* (incl. ssp nemorum) (wood-stitchwort) | 1987-1999 | Native | 7 |
| *Stellaria pallida* (lesser chickweed) | 1987-1999 | Native | 11 |
| *Stellaria palustris* (marshy stichwort) | Pre-1970 | Native | 1 |
| *Subularia aquatica* (awlwort) | Pre-1970 | Native | 1 |
| *Thalictrum flavum* (meadow rue) | 1987-1999 | Native | 8 |
| *Thalictrum minus* (lesser meadow-rue) | 1987-1999 | Native | 11 |
| *Thelypteris palustris* (marsh fern) | 1987-1999 | Native | 3 |
| *Thymus pulegioides* (large thyme) | 1987-1999 | Native | 8 |
| *Tilia platyphyllos* (large-leaved lime) | 1987-1999 | Native | 7 |
| *Trichomanes speciosum* (gametophyte) (Killarney fern) | 1987-1999 | Native | 9 |
| *Trichomanes speciosum* (sporophyte) | 1987-1999 | Native | 1 |
| *Trifolium glomeratum* (clustered clover) | Pre-1970 | Native | 2 |
| *Trifolium ornithopodioides* (bird's-foot clover) | 1987-1999 | Native | 10 |
| *Trifolium squamosum* (sea clover) | 1987-1999 | Native | 8 |
| *Trifolium subterraneum* (subterraneum clover) | 1987-1999 | Native | 6 |
| *Trollius europaeus* (globe-flower) | 1987-1999 | Native | 12 |
| *Typha angustifolia* (lesser bulrush) | 1987-1999 | Native | 8 |
| *Typha angustifolia x T. latifolia* | 1987-1999 | Native | 1 |
| *Ulmus plotii* (plot's elm) | Pre-1970 | Native | 1 |
| *Utricularia australis* (bladderwort) | 1987-1999 | Native | 6 |
| *Utricularia minor* (lesser bladderwort) | 1987-1999 | Native | 7 |
| *Utricularia vulgaris sens. str*. (greater bladderwort) | 1987-1999 | Native | 1 |
| *Vaccinium vitis-idaea* (cowberry) | 1987-1999 | Native | 9 |
| *Valerianella dentata* (narrow-fruited corn-salad) | 1987-1999 | Alien | 2 |
| *Valerianella rimosa* (broad-fruited cornsalad) | Pre-1970 | Alien | 2 |
| *Verbascum lychnitis* (white mullein) | 1987-1999 | Alien | 3 |
| *Verbascum nigrum* (black mullein) | 1987-1999 | Native | 4 |
| *Verbascum virgatum* (twiggy mullein) | 1987-1999 | Alien | 12 |
| *Veronica spicata* (spiked speedwell) | 1987-1999 | Native | 2 |
| *Vicia lathyroides* (spring vetch) | 1987-1999 | Native | 8 |
| *Vicia orobus* (wood bitter-vetch) | 1987-1999 | Native | 20 |
| *Vicia sylvatica* (wood vetch) | 1987-1999 | Native | 9 |
| *Viola lactea* (pale dog-violet) | 1987-1999 | Native | 6 |
| *Viola lutea* (mountain pansy) | 1987-1999 | Native | 10 |
| *Vulpia ciliata* (bearded fescue) | 1987-1999 | Native | 1 |
| *Wolffia arhiza* (rootless duckweed) | 1987-1999 | Native | 1 |
| *Zostera angustifolia* (narrow-leaved eelgrass) | 1987-1999 | Native | 1 |
| *Zostera marina* (eelgrass) | 1987-1999 | Native | 2 |
| *Zostera noltii* (dwarf eelgrass) | 1987-1999 | Native | 1 |

**Table 16. Contributory Species from Monmouthshire, Glamorgan and Carmarthenshire**

| Contributory species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Agrimonia procera* (fragrant agrimony) | 1987-1999 | Native | 34 |
| *Alchemilla glabra* (a lady's-mantle) | 1987-1999 | Native | 34 |
| *Alchemilla xanthochlora* (a lady's-mantle) | 1987-1999 | Native | 27 |
| *Althea officinalis* (marsh-mallow) | 1987-1999 | Native | 15 |
| *Anacamptis pyramidalis* (pyramidal orchid) | 1987-1999 | Native | 27 |
| *Anchusa arvensis* (bugloss) | 1987-1999 | Alien | 18 |
| *Anthemis cotula* (stinking chamomile) | 1987-1999 | Alien | 20 |
| *Apium graveolens* (wild celery) | 1987-1999 | Native | 23 |
| *Apium inundatum* (lesser marshwort) | 1987-1999 | Native | 16 |
| *Arenaria serpyllifolia subsp.leptoclad.* (thyme-lvd sandwort) | 1987-1999 | Native | 36 |
| *Asplenium marinum* (sea spleenwort) | 1987-1999 | Native | 11 |
| *Asplenium trichomanes subsp.trichomanes* (mdnhair splnwrt) | 1987-1999 | Native | 17 |
| *Atriplex glabriuscula* (Babington's orache) | 1987-1999 | Native | 15 |
| *Atriplex laciniata* (frosted orache) | 1987-1999 | Native | 11 |
| *Atriplex littoralis* (grass-leaved orache) | 1987-1999 | Native | 12 |
| *Atriplex portulacoides* (sea-purslane) | 1987-1999 | Native | 18 |
| *Ballota nigra* (black horehound) | 1987-1999 | Alien | 32 |
| *Berberis vulgaris* (barberry) | 1987-1999 | Native | 17 |
| *Bidens cernua* (nodding bur-marigold) | 1987-1999 | Native | 25 |
| *Blackstonia perfoliata* (yellow-wort) | 1987-1999 | Native | 32 |
| *Botrichium lunaria* (moonwort) | 1987-1999 | Native | 25 |
| *Bromopsis erecta* (upright brome) | 1987-1999 | Native | 24 |
| *Bromus commutatus* (meadow brome) | 1987-1999 | Native | 17 |
| *Bromus racemosus* (smooth brome) | 1987-1999 | Native | 27 |
| *Bryonia dioica* (white bryony) | 1987-1999 | Native | 23 |
| *Cakile maritima* (sea rocket) | 1987-1999 | Native | 14 |
| *Callitriche obtusangula* (blunt-fruited water-satrwort) | 1987-1999 | Native | 22 |
| *Callitriche platycarpa* (various-leaved water-starwort) | 1987-1999 | Native | 25 |
| *Calystegia soldanella* (sea bindweed) | 1987-1999 | Native | 13 |
| *Carduus tenuiflorus* (slender thistle) | 1987-1999 | Native | 17 |
| *Carex disticha* (brown sedge) | 1987-1999 | Native | 22 |
| *Carex extensa* (long-bracted sedge) | 1987-1999 | Native | 15 |
| *Carex montana* (soft-leaved sedge) | 1987-1999 | Native | 18 |
| *Carex pseudocyperus* (cyperus sedge) | 1987-1999 | Native | 14 |
| *Carex strigosa* (thin-spiked sedge) | 1987-1999 | Native | 21 |
| *Carex vesicaria* (bladder sedge) | 1987-1999 | Native | 26 |
| *Carex viridula subsp. brachyrrhyncha* | 1987-1999 | Native | 19 |
| *Centaurea scabiosa* (greater knapweed) | 1987-1999 | Native | 38 |
| *Centaurium pulchellum* (lesser centaury) | 1987-1999 | Native | 14 |
| *Ceratocapnos claviculata* (climbing corydalis) | 1987-1999 | Native | 37 |
| *Ceratophyllum demersum* (rigid hornwort) | 1987-1999 | Native | 21 |
| *Chenopodium bonus-henricus* (good-king-Henry) | 1987-1999 | Alien | 22 |
| *Chrysanthemum segetum* (corn marigold) | 1987-1999 | Alien | 36 |
| *Chrysosplenium alternifolium* (alt.-leaved golden-saxifrage) | 1987-1999 | Native | 24 |
| *Circaea alpina x C. lutetiana* | 1987-1999 | Native | 15 |
| *Cirsium acaule* (dwarf thistle) | 1987-1999 | Native | 18 |
| *Cirsium eriophorum* (woolly thistle) | 1987-1999 | Native | 16 |
| *Crambe maritima* (sea-kale) | Pre-1970 | Native | 9 |
| *Cystopteris fragilis* (brittle bladder-fern) | 1987-1999 | Native | 25 |
| *Dactylorhiza incarnata* (early marsh-orchid) | 1987-1999 | Native | 27 |
| *Dactylorhiza purpurella* (northern marsh-orchid) | 1987-1999 | Native | 17 |
| *Daphne laureola* (spurge laurel) | 1987-1999 | Native | 16 |
| *Daucus carota subsp. gummifer* (sea carrot) | 1987-1999 | Native | 8 |
| *Diplotaxis tenuifolia* (perennial wall-rocket) | 1987-1999 | Alien | 24 |

| Contributory species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Echium vulgare* (viper's bugloss) | 1987-1999 | Native | 36 |
| *Eleocharis multicaulis* (many-stalked spike-rush) | 1987-1999 | Native | 29 |
| *Eleocharis quinqueflora* (few-flowered spike-rush) | 1987-1999 | Native | 26 |
| *Eleogiton fluitans* (floating club-rush) | 1987-1999 | Native | 19 |
| *Elytrigia juncea* (sand couch) | 1987-1999 | Native | 18 |
| *Elytrigia juncea x E. repens* | 1987-1999 | Native | 2 |
| *Empetrum nigrum* (crowberry) | 1987-1999 | Native | 26 |
| *Epipactis palustris* (marsh helleborine) | 1987-1999 | Native | 23 |
| *Equisetum variegatum* (variegated horsetail) | 1987-1999 | Native | 12 |
| *Erodium maritimum* (sea stork's-bill) | 1987-1999 | Native | 13 |
| *Eryngium maritimum* (sea-holly) | 1987-1999 | Native | 13 |
| *Euphorbia amygdaloides* (wood spurge) | 1987-1999 | Native | 31 |
| *Euphorbia exigua* (dwarf spurge) | 1987-1999 | Alien | 13 |
| *Euphorbia paralias* (sea spurge) | 1987-1999 | Native | 14 |
| *Euphorbia portlandica* (portland spurge) | 1987-1999 | Native | 14 |
| *Euphrasia anglica* (an eyebright) | 1987-1999 | Native | 19 |
| *Euphrasia arctica subsp. borealis* (an eyebright) | 1987-1999 | Native | 20 |
| *Euphrasia confusa* (an eyebright) | 1987-1999 | Native | 22 |
| *Euphrasia rostkoviana subsp.rostkoviana* (tall eyebright) | 1987-1999 | Native | 26 |
| *Filago minima* (small cudweed) | 1987-1999 | Native | 30 |
| *Frangula alnus* (alder buckthorn) | 1987-1999 | Native | 31 |
| *Fumaria bastardii* (tall ramping-fumitory) | 1987-1999 | Native | 17 |
| *Fumaria capreolata babbingtonii* (white ramping-fumitory) | 1987-1999 | Native | 15 |
| *Galium uliginosum* (fen bedstraw) | 1987-1999 | Native | 31 |
| *Gentianella amarella* (autumn gentian) | 1987-1999 | Native | 23 |
| *Geranium pratense* (meadow crane's-bill) | 1987-1999 | Native | 30 |
| *Geranium pusillum* (small-flowered crane's-bill) | 1987-1999 | Native | 23 |
| *Geranium rotundifolium* (round-leaved crane's-bill) | 1987-1999 | Native | 11 |
| *Geum rivale* (water avens) | 1987-1999 | Native | 31 |
| *Glaucium flavum* (yellow horned-poppy) | 1987-1999 | Native | 9 |
| *Gymnadenia conopsea* (fragrant orchid) | 1987-1999 | Native | 20 |
| *Gymnocarpium dryopteris* (oak fern) | 1987-1999 | Native | 14 |
| *Helianthemum nummularium* (rock-rose) | 1987-1999 | Native | 23 |
| *Helleborus foetidus* (stinking hellebore) | 1987-1999 | Native | 9 |
| *Helleborus viridis (*green hellebore) | 1987-1999 | Native | 8 |
| *Hippuris vulgaris* (mare's-tail) | 1987-1999 | Native | 14 |
| *Honkenya peploides* (sea sandwort) | 1987-1999 | Native | 16 |
| *Hordeum secalinum* (meadow barley) | 1987-1999 | Native | 31 |
| *Hypericum hirsutum* (hairy st John's-wort) | 1987-1999 | Native | 26 |
| *Inula crithmoides* (golden samphire) | 1987-1999 | Native | 13 |
| *Inula helenium* (elecampane) | 1987-1999 | Native | 21 |
| *Iris foetidissima* (stinking iris) | 1987-1999 | Native | 27 |
| *Isoetes echinospora* (spring quillwort) | 1987-1999 | Native | 2 |
| *Isolepis cernua (*slender club-rush) | 1987-1999 | Native | 14 |
| *Juncus acutus* (sharp rush) | 1987-1999 | Native | 11 |
| *Juncus foliosus* (leafy rush) | 1987-1999 | Native | 9 |
| *Juncus subnodulosus* (blunt-flowered rush) | 1987-1999 | Native | 22 |
| *Kickxia elatine* (sharp-leaved fluellen) | 1987-1999 | Alien | 26 |
| *Koeleria macrantha* (crested hair-grass) | 1987-1999 | Native | 20 |
| *Lamium amplexicaule* (henbit dead-nettle) | 1987-1999 | Alien | 13 |
| *Lamium hybridum* (cut-leaved dead-nettle) | 1987-1999 | Alien | 12 |
| *Lathraea squamaria* (toothwort) | 1987-1999 | Native | 24 |
| *Lathyrus nissolia* (grass vetchling) | 1987-1999 | Native | 15 |
| *Lathyrus sylvestris* (narrow-leaved everlasting-pea) | 1987-1999 | Native | 20 |
| *Lavatera arborea (*tree-mallow) | 1987-1999 | Native | 11 |

| Contributory species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Lemna gibba* (fat duckweed) | 1987-1999 | Native | 11 |
| *Lemna trisulca* (ivy-leaved duckweed) | 1987-1999 | Native | 18 |
| *Lepidium heterophyllum* (Smith's pepperwort) | 1987-1999 | Native | 36 |
| *Leymus arenarius* (lyme-grass) | 1987-1999 | Native | 9 |
| *Limonium binervosum agg.* (rock sea-lavender) | 1987-1999 | Native | 19 |
| *Limonium vulgare* (common sea-lavender) | 1987-1999 | Native | 14 |
| *Linum bienne* (pale flax) | 1987-1999 | Native | 18 |
| *Lithospermum officinalis* (gromwell) | 1987-1999 | Native | 15 |
| *Littorella uniflora* (shoreweed) | 1987-1999 | Native | 17 |
| *Malva neglecta* (dwarf mallow) | 1987-1999 | Alien | 20 |
| *Medicago arabica* (spotted medick) | 1987-1999 | Native | 23 |
| *Mentha suaveolens* (round-leaved mint) | 1987-1999 | Native | 7 |
| *Mercurialis annua* (annual mercury) | 1987-1999 | Alien | 19 |
| *Myosotis ramosissima* (changing forget-me-not) | 1987-1999 | Native | 31 |
| *Myosoton aquaticum* (water chickweed) | 1987-1999 | Native | 24 |
| *Myriophyllum alternifolium* (alternate water-milfoil) | 1987-1999 | Native | 28 |
| *Myriophyllum spicatum* (spiked water-milfoil) | 1987-1999 | Native | 28 |
| *Narcissus pseudonarcissus subsp. pseud.* (wild daffodil) | 1987-1999 | Native | 21 |
| *Neottia nidus-avis* (bird's-nest orchid) | 1987-1999 | Native | 17 |
| *Nuphar lutea* (yellow water-lily) | 1987-1999 | Native | 15 |
| *Nymphaea alba* (white waterlily) | 1987-1999 | Native | 31 |
| *Oenanthe fistulosa* (tubular water-dropwort) | 1987-1999 | Native | 18 |
| *Oenanthe lachenallii* (parsley water-dropwort) | 1987-1999 | Native | 25 |
| *Ononis spinosa* (prickly restharrow) | 1987-1999 | Native | 12 |
| *Ophrys apifera* (bee orchid) | 1987-1999 | Native | 28 |
| *Orchis morio* (green-winged orchid) | 1987-1999 | Native | 27 |
| *Ornithopus purpusillus* (bird's-foot) | 1987-1999 | Native | 29 |
| *Orobanche hederae* (ivy broomrape) | 1987-1999 | Native | 16 |
| *Orobanche minor* (carrot broomrape) | 1987-1999 | Native | 30 |
| *Osmunda regalis* (royal fern) | 1987-1999 | Native | 37 |
| *Papaver dubium subsp. lecoqii* (long-headed poppy) | 1987-1999 | Alien | 11 |
| *Parapholis strigosa* (hard-grass) | 1987-1999 | Native | 18 |
| *Paris quadrifolia* (herb paris) | 1987-1999 | Native | 26 |
| *Pedicularis sylvatica subsp. hibernica* (lousewort) | 1987-1999 | Native | 15 |
| *Petroselinum segetum* (corn parsley) | 1987-1999 | Native | 10 |
| *Phegopteris connectilis* (beech fern) | 1987-1999 | Native | 22 |
| *Phleum arenarium* (sand cat's-tail) | 1987-1999 | Native | 16 |
| *Picris hieracioides* (hawkweed oxtongue) | 1987-1999 | Native | 38 |
| *Pinguicula vulgaris* (butterwort) | 1987-1999 | Native | 31 |
| *Plantago media* (hoary plantain) | 1987-1999 | Native | 25 |
| *Platanthera chlorantha* (greater butterfly-orchid) | 1987-1999 | Native | 32 |
| *Polypodium cambricum* (southern polypody) | 1987-1999 | Native | 25 |
| *Populus nigra subsp. betulifolia* | 1987-1999 | Native | 22 |
| *Potamogeton pectinatus* (fennel pondweed) | 1987-1999 | Native | 17 |
| *Potamogeton pusillus* (lesser pondweed) | 1987-1999 | Native | 13 |
| *Potentilla erecta subsp. strictissima* (tormentil) | 1987-1999 | Native | 7 |
| *Prunus padus* (bird cherry) | 1987-1999 | Native | 26 |
| *Puccinellia distans* (reflexed saltmarsh-grass) | 1987-1999 | Native | 12 |
| *Pyrola rotundifolia subsp. maritima* | 1987-1999 | Native | 8 |
| *Ranunculus auricomus* (goldilocks buttercup) | 1987-1999 | Native | 20 |
| *Ranunculus sardous* (hairy buttercup) | 1987-1999 | Native | 14 |
| *Ranunculus trichophyllos* (thread-leaved water-crowfoot) | 1987-1999 | Native | 16 |
| *Reseda lutea* (wild mignonette) | 1987-1999 | Native | 34 |
| *Rhamnus catharticus* (buckthorn) | 1987-1999 | Native | 19 |
| *Rhinanthus minor subsp. stenophyllus* (yellow rattle) | 1987-1999 | Native | 7 |

| Contributory species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Rorippa microphylla* (narrow-fruited watercress) | 1987-1999 | Native | 14 |
| *Rorippa microphylla x R. nasturtium-aq.* | 1987-1999 | Native | 18 |
| *Rosa caesia subsp. glauca* (glaucous dog-rose) | 1987-1999 | Native | 14 |
| Ros*a caesia x R. canina* (*R. x dumalis*) | 1987-1999 | Native | 21 |
| *Rosa canina x R. stylosa* | 1987-1999 | Native | 11 |
| *Rosa pimpinellifolia* (burnet rose) | 1987-1999 | Native | 19 |
| *Rosa stylosa* (short-styled field-rose) | 1987-1999 | Native | 17 |
| *Rubia peregrina* (madder) | 1987-1999 | Native | 23 |
| *Rumex hydralopathum* (water dock) | 1987-1999 | Native | 29 |
| *Sagina mariti*ma (sea pearlwort) | 1987-1999 | Native | 13 |
| *Sagina nodosa* (knotted pearlwort) | 1987-1999 | Native | 21 |
| *Salicornia dolichostachya* (long-spiked glasswort) | 1987-1999 | Native | 10 |
| *Salicornia ramosissima* (purple glasswort) | 1987-1999 | Native | 13 |
| *Salix purpurea* (purple willow) | 1987-1999 | Native | 16 |
| *Salix trandra* (almond willow) | 1987-1999 | Native | 17 |
| *Salsola kali subsp. kali* (prickle saltwort) | 1987-1999 | Native | 12 |
| *Salvia verbenaca* (wild clary) | 1987-1999 | Native | 8 |
| *Sambucus ebulus* (dwarf elder) | 1987-1999 | Alien | 24 |
| *Samolus valerandi* (brookweed) | 1987-1999 | Native | 24 |
| *Saxifraga granulata* (meadow saxifrage) | 1987-1999 | Native | 22 |
| *Scabiosa columbaria* (small scabious) | 1987-1999 | Native | 14 |
| *Schoenoplectus lacustris* (common club-rush) | 1987-1999 | Native | 11 |
| *Schoenoplectus tabernaemontani* (grey club-rush) | 1987-1999 | Native | 17 |
| *Scilla verna (*Spring squill*)* | 1987-1999 | Native | 10 |
| *Scirpus sylvaticus* (wood club-rush) | 1987-1999 | Native | 25 |
| *Senecio aquaticus x S. jacobaea* | 1987-1999 | Native | 4 |
| *Seriphidium maritimum* (sea wormwood) | 1987-1999 | Native | 15 |
| *Silaum silaus* (pepper-saxifrage) | 1987-1999 | Native | 21 |
| *Silene uniflora* (sea campion) | 1987-1999 | Native | 20 |
| *Sison amomum* (stone parsley) | 1987-1999 | Native | 19 |
| *Sorbus torminalis* (wild service) | 1987-1999 | Native | 22 |
| *Sparganium emersum* (unbranched bur-reed) | 1987-1999 | Native | 29 |
| *Spergularia marina* (lesser sea-spurrey) | 1987-1999 | Native | 19 |
| *Spergularia media* (greater sea-spurrey) | 1987-1999 | Native | 22 |
| *Spiranthes spiralis* (autumn lady's-tresses) | 1987-1999 | Native | 17 |
| *Spirodela polyrhiza* (greater duckweed) | 1987-1999 | Native | 16 |
| *Stachys palustris x S. sylvatica* | 1987-1999 | Native | 16 |
| *Torilis nodosa* (knotted hedge-parlsey) | 1987-1999 | Native | 14 |
| *Trifolium fragiferum* (strawberry clover) | 1987-1999 | Native | 20 |
| *Trifolium scabrum* (rough clover) | 1987-1999 | Native | 24 |
| *Trifolium striatum* (knotted clover) | 1987-1999 | Native | 25 |
| *Ulex europaeus x U. gallii* | 1987-1999 | Native | 1 |
| *Ulmus minor* (small-leaved elm) | 1987-1999 | Native | 19 |
| *Urtica urens* (small nettle) | 1987-1999 | Alien | 26 |
| *Vaccinium oxycoccus* (cranberry) | 1987-1999 | Native | 28 |
| *Valarienella carinata* (keel-fruited corn-salad) | 1987-1999 | Alien | 24 |
| *Veronica agrestis* (green field-speedwell) | 1987-1999 | Alien | 50 |
| *Veronica anagallis-aquatica* (blue water-speedwell) | 1987-1999 | Native | 16 |
| *Veronica catenata* (pink water speedwell) | 1987-1999 | Native | 22 |
| *Veronica polita* (grey field-speedwell) | 1987-1999 | Alien | 45 |
| *Viburnum lantana* (wayfaring tree) | 1987-1999 | Native | 24 |
| *Viola canina* (heath dog-violet) | 1987-1999 | Native | 15 |
| *Viola hirta* (hairy dog-violet) | 1987-1999 | Native | 24 |
| *Viola palustris subsp. juressi* (marsh violet) | 1987-1999 | Native | 10 |
| *Viola tricolor* (wild pansy) | 1987-1999 | Native | 27 |

| Contributory species | Date class | Status | Total 10km Squares |
|---|---|---|---|
| *Viola tricolor subsp. curtisii* (wild pansy) | 1987-1999 | Native | 10 |
| *Viscum album* (mistletoe) | 1987-1999 | Native | 27 |
| *Vulpia fasciculata* (dune fescue) | 1987-1999 | Native | 14 |
| *Zannichellia palustris* (horned pondweed) | 1987-1999 | Native | 21 |

## S8) FUNGI

The following should be considered for selection:

- all grassland sites suporting 8 or more species of waxcap (*Hygrocybe* spp.)
- any site which supports a species, which is listed in the UK Red Data Book (NCC, 1987) or in the "Section 74 List" (WAG 2003).
- 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 which is recorded from 3 or fewer sites within a Watsonian Vice County (where the distribution is well known).
- any site which support a significant population of a National or Local Priority Species as listed in a Local Biodiversity Action Plan.

***Context***

There is an enormous diversity of fungi, ranging from the several thousand "larger" fungi (eg toadstools, bracket fungi, earth stars, stinkhorns, fairy clubs, puffballs, earthtongues, etc), to the even more numerous moulds, rusts and yeasts. 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 South 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 South 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 South 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 South 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 South Wales has perhaps the greatest international responsibility.

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 availiable are also likely to contain rare species and/or important assemblages.

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).

At present there is a recognised need for a reappraisal of the UK Red Data Book list of higher fungi, and there is as yet no accepted list of species which thorough recording would show are found in no more than 100 10km squares of the National Grid (ie 'Nationally Scarce'). This complicates the application of the second of the above guidelines. However, it is important that whilst further work on UK fungi status is undertaken, Wildlife Sites can be designated for species which are UK BAP priorities, listed in the existing UK Red Data Book, or which are otherwise clearly nationally scarce.

The development of lists of locally rare fungi is even further off. 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 local experts that a species is locally rare.

The guidelines do not attempt to allow designation of Wildlife Sites on the basis of overall larger fungi diversity. Fungi recording has not been extensive or systematic enough in South 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.

**The compilation of lists for the groups S9 and S10 was deemed to be beyond present resources and will have to await further investigation at a later date. In the meantime the guidance found below should be applied, with further information to be sought from published sources.**

## S9) MOSSES AND LIVERWORTS

The following 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 74 List" (WAG 2003).

- 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).

Some areas within South Wales are better recorded than others and where queries occur the appropriate recorder/expert should be contacted. For VC35 refer to the Monmouthshire Register of Rare Bryophytes (Bosanquet, 2003) and Mr S. Bosanquet. VC41 is poorly recorded but Mr R. Perry may be able to advise, and for VC44, Mr G. Motley could advise.

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

## S10) LICHENS

The following should be considered for selection;

- any site which supports a species which is listed in the Red Data Book for Lichens (Church et al, 1996) or the "Section 74 List" (WAG 2003).

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

- any site which support a significant population of a National or Local Priority Species listed in a Local Biodiversity Action Plan.

# 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 AD1500**.**

**BTO:** British Trust for Ornithology

**DAFOR:** A description of the distribution of plant species used when carrying out a Phase 1 survey; Dominant, Abundant, Frequent, Occasional, Rare.

**DETR:** Department for the Environment and Transport

**EBCC:** European Bird Census Council

**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.

**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.

**HEGS:** The Hedgerow Evaluation Grading System (Clements & Tofts 1992)

**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.

**Littoral:** Belonging to the seashore.

**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.

**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

**SINC's**: 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.

**WAG:** Welsh Assembly Government

**WWT:** The Wildfowl and Wetlands Trust

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## Local Biodiversity Action Plans in the South Wales Region:

**Bridgend County Borough Council**
A Local Biodiversity Action Plan for Bridgend County Borough.
Website; www.bridgend.gov.uk

**Brecon Beacons National Park**
Our Natural World - a local Biodiversity Action Plan for the Brecon Beacons National Park.
Website; www.breconbeacons.org

**Blaenau Gwent County Borough Council**
Local Biodiversity Action Plan for Blaenau Gwent.
Website; www.blaenau-gwent.gov.uk

**Torfaen County Borough Council**
Local Biodiversity Action Plan for Torfaen County Borough Council.
Website; www.torfnet.gov.uk

**Caerphilly County Borough Council**
Caerphilly County Borough Council Biodiversity Action Plan.
Website; www.caerphilly.gov.uk

**Carmarthenshire County Borough Council**
A local Biodiversity Action Plan for Carmarthenshire.
Website; www.carmarthenshire.gov.uk

**Methyr Tydfil County Borough Council**
Action for Wildlife in Methyr Tydfil: The Methyr Tydfil Biodiversity Action Plan.
Website; www.methyr.gov.uk

**Rhondda Cynon Taff County Borough Council**
Action for Nature: A local Biodiversity Action Plan for Rhondda Cynon Taff.
Website; www.rhondda-cynon-taff.gov.uk