

CRITERIA FOR THE SELECTION OF LOCAL WILDLIFE SITES IN POWYS

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Montgomeryshire
Maldwyn



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Policy Framework

Environment (Wales) Act 2016

The Environment (Wales) Act aims to build greater resilience into our ecosystems. Biodiversity and well-functioning ecosystems provide natural solutions that build resilience, which in turn help society create jobs, support livelihoods and human well-being, adapt to the adverse impacts of climate change and contribute to sustainable development.

Section 6 of the Act introduced an enhanced biodiversity and resilience of ecosystems duty (the S6 duty) for public authorities in the exercise of functions in relation to Wales. The S6 duty requires that public authorities must seek to maintain and enhance biodiversity so far as consistent with the proper exercise of their functions and in so doing promote the resilience of ecosystems.

Section 7 replaces the duty in Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006. The Welsh Ministers will publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales – Section 7 habitats and species. The Welsh Ministers must also take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section and encourage others to take such steps.

Part 1 of the Act, including Sections 6 and 7, came into force on May 21, 2016.

Planning Policy Wales (PPW) 10

Planning Policy Wales Edition 10, December 2018, sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. PPW, the TANs, MTANs and policy clarification letters comprise national planning policy.

PPW 10 considers Local Wildlife Sites as follows:

Figure 11: Designated Sites Hierarchy

Tier	Name	Statutorily and Non Statutorily Protected Sites
International	Special Area of Conservation	Statutory
	Special Protection Area	Statutory
	Ramsar sites	Statutory
	UNESCO Biosphere Reserve	Non-Statutory
National	Site of Special Scientific Interest	Statutory
	National Nature Reserve	Statutory
Local	Sites of Importance for Nature Conservation	Non-Statutory
	Local Nature Reserve	Non-Statutory
	Local Wildlife Sites	Non-Statutory

Protection for Non-statutory Designations – “6.4.20 *Although non-statutory designations carry less weight than statutory designations, they can make a vital contribution to delivering an ecological network for biodiversity and resilient ecosystems, and they should be given adequate protection in development plans and the development management process. Before authorising development likely to damage a local wildlife designation, planning authorities should give notice of the proposed operation to the County Ecologist and third sector environmental organisations. Where a Green Infrastructure Assessment* has identified that certain features or characteristics of the site need to be conserved or enhanced, planning authorities should state in their development plans what features or characteristics require this extra protection and why, and explain how the policies will achieve this protection. Assessments should similarly consider the presence of protected and priority species including those on the Section 7 list and appropriate weight attached to their protection. Policies for non-statutory sites should make it clear that such designations do not preclude appropriate developments, where there are no adverse impacts on the features for which a site is designated.*”

*NOTE: The Green Infrastructure Assessment for Powys has not yet been written. PPW10 was produced too late to be incorporated into the 2018 Powys Local Development Plan (LDP). It is currently anticipated that this will be done as part of the planned review of the LDP in 2022.

Technical Advice Note (TAN) 5: Nature Conservation and Planning

TAN 5 of Planning Policy Wales, produced in 2009, is one of a series of Technical Advice Notes (TANs) which supplement Planning Policy Wales. Section 5.5 covers ‘Local Sites’:

“5.5.1 *Local sites have an important role to play in meeting biodiversity targets and contributing to the quality of life and well-being of the community. Paragraph 5.3.11 of PPW explains the policy in respect of such sites. Policies in UDPs and Local Development Plans provide for their protection. The nature conservation interests for which they have been designated are a material consideration in planning decisions.*

Criteria for the selection of Local Wildlife Sites in Powys

5.5.2 *Locally designated sites should be subject to the application of rigorous criteria to ensure their designation is justified on biological or geological grounds. The process of designating and maintaining the sites should be transparent with records and assessments publicly available, unless information about particular species is sensitive in terms of their protection. Developers should be able to identify how their proposals may affect the interests for which the sites are designated (either positively or negatively) and where relevant, how the sites contribute to wider ecological networks or mosaics.*

5.5.3 *The conservation and enhancement of locally designated sites is an important contribution to the implementation of Biodiversity Action Plans and to the management of features of the landscape of major importance for wild flora and fauna (see paragraph 3.2.2 above). Developers should avoid harm to those interests where possible. Where harm is unavoidable it should be minimised by mitigation measures and offset as far as possible by compensation measures designed to ensure there is no reduction in the overall nature conservation value of the area or feature. Where locally designated sites may be affected, developers should consult the local planning authority and Wildlife Trust and/or Local Record Centre to agree the information that will be required to assess the implications of the development and mitigation and compensatory measures.*

5.5.4 *Where development proposals may affect national or local BAP habitats or species the same principles apply as to locally designated sites in paragraph 5.5.2 above (see further habitats and species of principal importance for biodiversity in Wales in section 6.5 below)."*

Powys Local Development Plan (LDP), adopted April 2018

Local Wildlife Sites are a material consideration in the Local Authority Planning (LPA) system, covered under LDP Policy DM2 – The Natural Environment, which states:

"Development proposals shall demonstrate how they protect, positively manage and enhance biodiversity and geodiversity interests including improving the resilience of biodiversity through the enhanced connectivity of habitats within, and beyond the site.

Development proposals which would impact on the following natural environment assets will only be permitted where they do not unacceptably adversely affect:"

"3. The locally important site designations, habitats and species including:

- A. Local Nature Reserves;*
- B. Local Biodiversity Action Plan Habitats and Species; and*
- C. Regionally Important Geodiversity Sites and Geological Conservation Review Sites.*

Development proposals likely to have an adverse impact upon these sites, habitats or species will only be permitted where it can be demonstrated that:

- i. They conserve and where possible enhance the natural heritage importance of the site, habitat or species; or*
- ii. The development could not reasonably be located elsewhere; and*
 - a. The benefits of the development outweigh the natural heritage importance of the site, habitat or species; and*
 - b. Mitigation and/or compensation measures are provided where adverse effects are unavoidable."*

The Powys LDP Supplementary Planning Guidance for Biodiversity and Geodiversity, adopted October 2018, clarifies this further, as follows:

“6.26 As well as sites referred to in Policy DM2, there are a number of other important locally designated sites, which applicants’ proposals will need, to ‘demonstrate how they protect, positively manage and enhance’.

*6.27 The most common of these local designations are **Sites of Interest for Nature Conservation (SINC)**. These are assessed and selected using specific criteria, which recognise their wildlife value, agreed by members of the Powys Biodiversity Partnership (see Appendix B). These sites help meet local and national biodiversity objectives and contribute to the quality of life and well-being of the local community. SINC are not necessarily open to the public, with the majority having no public access at all. Should a site visit be necessary for surveying purposes then applicants must contact the landowner to seek permission to enter the site.*

*6.28 When a SINC has been identified, subsequent negotiations with the landowner can result in a management agreement being drawn up and the site becoming a **Local Wildlife Site (LWS)**. Where funding allows, these additional negotiations are usually carried out by the three Wildlife Trusts (WT) that operate in Powys (see Appendix B).”*

Acknowledgements

These criteria for the selection of Local Wildlife Sites in Powys have been developed over three years, as part of the ‘Where the Wild Things Are’ project. We thank all the surveyors who gathered data from existing and potential Local Wildlife Sites, providing real world data to inform this process. Many individuals have given a significant amount of their time to write, inform and finalise these criteria, namely Julian Jones and Darylle Hardy at Radnorshire Wildlife Trust, Stephanie Coates and Sarah Woodcock at The Wildlife Trust for South and West Wales, David Drewett (Natural Resources Wales) and Ray Woods. We’d also like to thank all the local experts who provided information and guidance, including Mike Haigh, Andrew King and Peter Jennings (birds), Phil Ward, Chris Ledbury, Clare Boyes, Janice Vincent, Anne Coker and Bob Dennison (invertebrates), Kate Thorne and Gillian Foulkes (plants). Jo Milborrow, Ben Mullen and Janet Imlach at the Biodiversity Information Service for Powys & Brecon Beacons National Park (BIS) have also provided help and support during the process. Finally, we wish to thank the funder, Arwain, without whom the project would not have been possible.

Tammy Stretton, Montgomeryshire Wildlife Trust, December 2019

Background

Local Wildlife Sites are sites of substantive nature conservation value. They are the most important places for wildlife outside statutory designated sites and the linkages they provide in a local context, are of vital importance to the whole biodiversity resource within a given area.

The origins of biological Local Sites systems stretch back to the 1970s, when wildlife trusts in the UK wished to protect and encourage the management of the whole biodiversity resource within a given local government area. The idea behind this was to provide an inclusive system of sites to support and re-enforce the features of statutory designated sites.

For a Local Site system to succeed and be given due recognition, it is important that rigorous criteria be produced for the selection of a 'Local Wildlife Site'. The system can then demonstrate why a particular site has passed or has not met the criteria for being a 'Local Wildlife Site', making it a justifiable process.

In 1999, the wildlife trusts in Wales published biological guidelines and criteria for the selection of Local Wildlife Sites, based upon Hawkswell 1997. Three systems were developed, covering North Wales, Powys and the south and west of Wales. After 20 years, the need for a review of the Powys criteria has become increasingly urgent. The number of currently selected Local Wildlife Sites in Powys is relatively low and is not deemed to truly reflect the wildlife value of the area. At the same time, the pressures on our landscape continue to grow and there has been no let-up in the net loss of nature (Hayhow et al 2019). Potential Local Wildlife Sites are being lost before they are even known about, through changes in land management and development, leading not only to a loss of habitat and biodiversity, but also connectivity across the landscape. We are now becoming increasingly aware of the impact this is having, not only on nature, but also the human race. Local Wildlife Sites have a critical role to play in not only halting biodiversity loss, but also in mitigating climate change.

Introduction

A successful biological local site system requires rigorous criteria for sites to be identified. General guidelines for choosing and evaluating sites of nature conservation importance were first formulated by Ratcliffe, 1977. Collis & Tyldesley 1993 and Hawkswell 1997, built on these guidelines with respect to Wildlife Sites.

A good model for the selection of Local Wildlife Sites is considered to be the criteria used in selecting the national series of Sites of Special Scientific Interest (SSSI). 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.

Between 2017 and 2019, Montgomeryshire Wildlife Trust, Radnorshire Wildlife Trust and The Wildlife Trust for South and West Wales, have been working together on the Arwain funded 'Where the Wild Things Are' project. A key outcome for this project is to complete a review of the criteria for the selection of the Local Wildlife Sites in Powys, making them easily workable and fully embedded in the Local Planning Authority system. The criteria have been developed from Wildlife Sites Guidance Wales (Wales Biodiversity Partnership 2008), using some elements of the 1999 Powys Local Wildlife Site system and in discussion with a wide range of organisations and local experts.

The Local Wildlife Sites criteria laid out in this document are considered to be appropriate for the selection of quality habitats and species, but should not be seen as being set in 'tablets of stone'. Nature is dynamic and policies and legislation change. It is anticipated that this will

Criteria for the selection of Local Wildlife Sites in Powys

be a living document which is regularly updated as and when changes are needed. Ultimately, decisions on which sites are selected/deselected should be taken by the Powys Local Wildlife Site Partnership, following consultation with local experts, where necessary.

This document is split into two broad sections, the habitat criteria (H1 – H13) and the species criteria (S1 – S10). Some sites may be significant entirely because a certain species is present, whilst others may be significant because they contain a threatened habitat type or a diverse range of habitats. Most sites will be selected on the basis of habitat; it is, after all, the habitat in which the species usually depends and most sites will be of interest on both grounds. However, some sites may be significant entirely because a certain species is present and may need to be managed in a particular way to benefit this species. These sites should then be selected using the species criteria.

Relationship with Nationally Designated Sites

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

- a SSSI is notified on geological grounds and is subsequently selected as a Local Wildlife Site because of its biological (i.e. nature conservation) interest;
- the reasons for SSSI notification omit to mention key features which qualify for Local Wildlife Site status.

Geological Sites

Many potential Local Wildlife Sites in Wales are also of geological or geomorphological importance in addition to their nature conservation significance and there are other sites, which may have value and significance on geological grounds alone. Local 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; for example, Inland Rock and Scree habitats.

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 Local Wildlife Sites, being concerned primarily with the identification of educational or demonstration sites, this programme nevertheless offers a separate mechanism for the identification and protection of geological sites.

Site Boundaries

Selection of site boundaries can be difficult and contentious. There is a need to designate Local Wildlife Sites of sufficient size to allow reasonable long-term ecological viability and continuation or introduction of favourable management. Site boundaries should be drawn as far as possible to be meaningful in ecological terms. Where sites are selected on species guidelines, appropriate regard should be given to the habitat requirements of the species concerned.

Observable physical boundaries or topographic features should be used as boundaries wherever possible. Where only part of a management unit is of qualifying quality, the whole management unit can still be selected. Where areas (such as single fields) failing to meet the criteria occur within a definable complex of management units (such as a block of fields),

then the whole complex can still be selected as a Local Wildlife Site, providing the qualifying areas form a clear majority of this Local Wildlife Site.

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

Ultimately, site boundaries should be agreed by the Powys Local Wildlife Site Partnership when sites are selected.

Site selection process

Survey methodology (new sites)

In general, any area of land or water which satisfies one or more of the criteria is eligible for designation as a Local Wildlife Site. Sites should generally be evaluated on the basis of reliable information that is as up to date as possible. 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 addition, information relating to the history of the site and, if appropriate, its use by the local community may be collected. This will usually involve collating existing data and further survey work.

Every site vegetation survey completed should include information concerning:

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

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

Re-surveying and monitoring of Wildlife Sites

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

Selecting sites

Once the required amount of data has been gathered for a site, the user can then assess that site against the criteria detailed in this document. Sites passing one or more criteria should then be put forward to the Powys Local Wildlife Sites Partnership for selection. The Partnership will decide whether this candidate should be selected, referring to local experts for advice, where necessary. Once ratified by the Partnership, a candidate is selected as a Site of Interest for Nature Conservation (SINC). Dialogue with the landowner(s) should then follow (although this may have occurred prior to selection). Once agreement has been reached with the landowner, the site will be selected as a Local Wildlife Site (LWS).

LWS are not selected without landowner permission. If landowner permission is refused, the site will remain a SINC. Where there are multiple owners, one or more may refuse permission. In this case, the Powys Local Wildlife Sites Partnership will need to decide on how to proceed. Parts of the site, where permission is granted could be selected and the boundary redrawn to reflect this; for example, if owner A owns the majority of the site or the area of most interest and gives permission, his land would be selected as a discrete LWS; owner B refuses permission, so his land would be excluded, or selected as a discrete SINC. It may be decided that splitting the site would not be beneficial and in this case the whole site would remain a SINC.

When a site is being assessed as a SINC/LWS, some sort of report is necessary. This typically comprises a site summary, including management & reason(s) for selection, a full species list and map(s). Appendix 1 contains an example of such a report. When a site is selected as a LWS, this report should be shared with all the landowners and updates provided following re-survey.

It must be noted that working with landowners is seen as an important part of the Local Wildlife Site system, but is also time consuming. This work is typically carried out by the wildlife trusts; as the Trusts are all small charities, funding is usually required for surveys and/or landowner engagement to take place.

Deselection

A site, or part thereof, will remain a SINC/LWS until data is collected that proves it no longer meets the criteria. A site cannot have its status removed for political reasons, or as a result of wilful and deliberate destruction or neglect. The presumption is against deselection of sites.

Sites to be considered for deselection will be subject to survey by a person endorsed by the Powys Local Wildlife Sites Partnership and with permission from the landowner. Where landowner permission is not forthcoming, the site will remain (or be changed to) a SINC. As with all surveys and re-surveys, the Powys Local Wildlife Sites Partnership will consider and evaluate the survey information against the selection criteria.

Deselection may be recommended where the site's nature conservation interest has deteriorated to such an extent that it no longer qualifies as a SINC/LWS and where it is not possible to restore it through appropriate management. The potential for restoration will be an important factor in the decision.

Data

The Local Wildlife Site system generates a range of data, including:

- Habitat surveys;
- Species records;
- Site records;
- Site ownership records;
- Records of contact with landowner/managers, management advice given and site condition assessments.

Each site should also have a written report, which includes a boundary map, plus information on habitats and species found on the site.

The wildlife trusts in Powys (**Montgomeryshire Wildlife Trust, Radnorshire Wildlife Trust and The Wildlife Trust of South and West Wales**) hold the site reports, original site surveys, site ownership records, records of contact with landowners/managers and records relating to development issues. These are held in paper and electronic formats and in accordance with the Data Protection Act 2018.

Biodiversity Information Service for Powys & Brecon Beacons National Park (BIS)

holds species records, habitat and site boundary information, as well as a summary of the interest of the site, in order to disseminate through the Data Enquiry service or to users through Service Level Agreements (SLA). All data is held in accordance with the Data Protection Act 2018. More information on BIS can be found on their website:

<https://www.bis.org.uk>.

The main users of LWS data are:

- Site owners
- Local Planning Authority
- Statutory authorities
- Advisory organisations
- Consultancies and private companies

Most LWS data originates from survey work and monitoring conducted by the wildlife trusts, who are in turn, responsible for ensuring that BIS is provided with the most up to date information on LWS. Formal enquiries for information and species data should be directed to BIS, who can then direct the user to the relevant wildlife trust, should the level of data received be insufficient.

HABITAT CRITERIA

The habitat criteria are structured according to the Section 7 list, grouped by the broad habitat categories, within which are the specific priority habitats. Some non-priority habitat categories are also included, where those are of local importance (locally rare, or especially distinctive/characteristic of the area) and these are grouped with the most relevant habitat types. When assessing a single habitat type, the user may simply refer to the relevant section. For sites with more than one habitat type, the user must decide on the appropriate approach:

1. For sites consisting largely of one habitat type, with small areas of other habitats within and adjacent, the site should be assessed using only the primary habitat type, but the other habitats included in the site boundary.
2. Where one habitat type is larger or more locally/nationally significant than the others, the site will be assessed using the main habitat type, but all habitats should be assessed under their relevant criteria. Where sites pass on multiple habitat criteria, this should be noted.
3. If the site is a mosaic of habitats with no obvious dominant/particularly special habitat, where habitats are sufficiently discrete, they can be assessed using the relevant selection criteria; where sites pass on multiple habitat criteria, this should be noted. If no single habitat passes, the site should be assessed under the 'Mosaic Habitats' criteria (H12).

For some habitats, there is a distinction between lowland and upland. Lowland habitats are here defined as areas which lie below the uppermost enclosure boundary ('the ffridd/coed cae boundary'). In practice, this often lies at an altitude of about 300m. Upland habitats are here taken to comprise those that lie above the uppermost enclosure boundary.

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

Many of the habitats refer to the National Vegetation Classification (NVC) (Rodwell 1991 et seq.). However, selection of appropriate Local 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, lists of indicator species have been compiled for certain habitats. Where considered appropriate, this has can be accompanied by a threshold number of species, which will need to be reached before a site can be selected as a Local Wildlife Site on the basis of its vegetation type and diversity.

Lists of indicator species are especially valuable in instances where an NVC type can contain examples of a wide range of quality, such as the MG6 semi-improved lowland meadow. A species-rich MG6 grassland containing a reasonably large number of indicators

Criteria for the selection of Local Wildlife Sites in Powys

of unimproved grassland will be worthy of selection, whilst a relatively species-poor MG6 grassland with few such indicators, would not. The species lists are comprised of native species or archaeophytes, which are characteristic of the vegetation type in question. In the case of the grassland, species that are regularly found in agriculturally improved grasslands are generally excluded from the species lists. Plant species rare enough to merit Local Wildlife Site designation on the basis of their presence alone can be found in the Species Criteria Vascular Plant section (S6).

The species lists and appropriate threshold values given in this document were drawn up with local experts, using information from Wildlife Sites Guidance Wales, the 1999 Powys LWS system and the county rare plant registers. This approach has been developed to ensure sites with appropriate quality, as recognised by balanced application of the Ratcliffe Criteria, are selected. However, anomalies may occur; e.g. sites on calcareous substrates may qualify against the Local 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 Local Wildlife Site designation.

Special Cases - Mosaic Habitats

Mosaic sites, comprising complex mixtures of semi-natural habitats, are acknowledged to be problematic when determining guidelines for Local 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 section H12 - Mosaic Habitats.

H1) BROADLEAVED, MIXED, AND YEW WOODLAND

Wales is one of the least wooded countries in Europe, with woodland covering only 15% of the land area, compared to the EU average of 38%. Only around 5% of woodlands in Wales have designated conservation status. All woodlands, including 20th century coniferous planted woodland, provide habitat for a wide range of flora and fauna but some woodland types are more significant than others from a biodiversity perspective. Semi-natural broadleaved woodlands comprise seven of the habitats of principal importance in Wales (listed on Section 7 of the Environment (Wales) Act 2016) and support 39% of Section 7 species (Woodlands for Wales 2018).

The Section 7 list of priority woodland habitats are as follows:

- Traditional orchards
- Wood pasture & parkland
- Upland oak woodland
- Lowland beech and yew woodland
- Upland mixed ash woodland
- Wet woodland
- Lowland mixed deciduous woodland

Definitions of all these habitat types is available on the [JNCC website](#).

The Ancient Woodland Inventory for Wales was updated in 2011; more information on ancient woodland, including maps showing their location can be obtained from [NRW](#).

Powys' woodland Local Wildlife Sites are split into three categories, as follows:

1. Traditional orchards
2. Wood pasture & parkland
3. Native woodlands

H1.1) TRADITIONAL ORCHARDS

Traditional Orchards represent a historic land use and have greatly declined in recent decades. Traditionally managed orchards support characteristic invertebrate faunas, including a number of rare specialist species. Characteristic plants include Mistletoe (*Viscum album*), a very local species in Wales. Many historic fruit varieties may persist in old orchards and are of potential value to fruit-growers.

The following sites should be considered for selection:

- ***all undesignated orchards ≥ 0.25 ha which are, or were, traditionally managed and which still contain a good scatter of old fruit trees.***

Traditional orchards are defined, for priority habitat purposes, as groups of fruit and nut trees planted on vigorous rootstocks at low densities in permanent grassland; and managed in a low intensity way (Oram et al. 2013). Orchards managed intensively for fruit production by the input of chemicals such as pesticides and inorganic fertilisers, frequent mowing of the

orchard floor rather than grazing or cutting for hay and planting of short-lived, high-density, dwarf or bush fruit trees, would not qualify.

Further information on orchards, can be obtained from [People's Trust for Endangered Species \(PTES\)](#).

H1.2) WOOD PASTURE, PARKLAND & VETERAN TREES

Wood pasture and parkland are mosaic habitats valued for their trees, especially veteran and ancient trees and the plants and animals that they support. 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).

Old trees can have an extremely high value for wildlife and have become increasingly uncommon as they are removed due to concerns about safety. Standing and fallen dead trees support unique assemblages of a great diversity of flora and fauna, but are often 'tided up'. Ancient and veteran trees are the most valuable. It is important to note that a tree can have the physical characteristics of an ancient tree, but not be ancient in years, compared with others of the same species. The term 'veteran' describes all trees that have markedly ancient characteristics, irrespective of chronological age. The term 'ancient' is applied specifically to trees that are ancient in years. For more detail on how to define ancient and veteran trees, see Lonsdale, 2013.

Ancient & veteran trees are typically of large stature and often support 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 and be both native and non-native species. 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. Groups of large willow (*Salix* spp.) pollards may also qualify, where they do not already fall into Local Wildlife Sites based on watercourses (see H9).

The following sites should be considered for selection:

- ***all undesignated parkland sites which are believed to have been derived from ancient woodland and which continue to support large mature trees;***
- ***all undesignated parkland sites, of whatever origin, containing ancient/veteran trees;***
- ***all ancient/veteran trees at least 1.5m girth* at 1.5m 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.***

* For some species, 1.5m is not considered a notable girth. Lonsdale, 2013 includes a chart (copied below) detailing the classification of eleven tree species. Where the LWS assessment is considering one of these species, this chart should be referred to, in which case the tree should be at least 'Locally notable' to qualify.

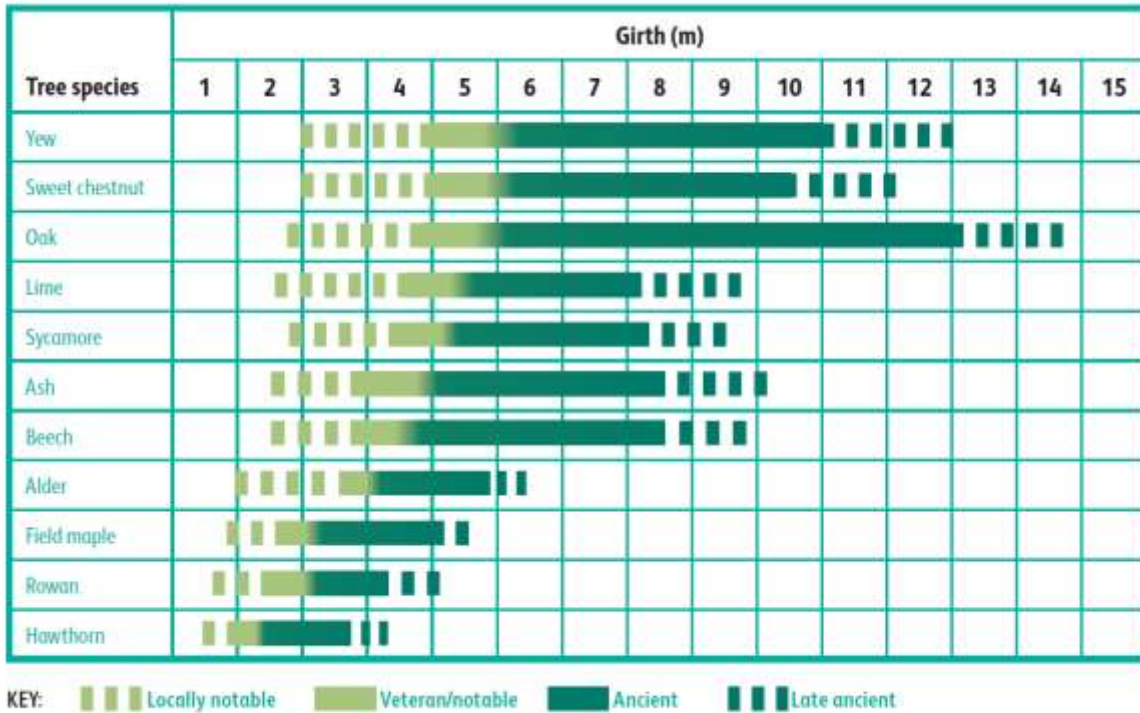


Fig 1.3: Chart of girth in relation to age and developmental classification of trees*

More information on wood pasture and parkland can be obtained from the [UK Wood Pasture & Parkland Network](#).

Lonsdale, 2013 includes further information on ancient and veteran trees, including survey methodology.

H2.3) NATIVE WOODLANDS

Woodlands for Wales 2018 defines native woodland as woods mainly or entirely composed of locally native species (one that arrived in Wales without assistance of humans during post-glacial colonisation). The five remaining native woodland priority habitats have been combined into one category – ‘native woodlands’. This reflects the fact that on the ground there is a dynamic continuum between woodland types. The setting of targets for individual types is deemed unrealistically precise, too complex and unduly prescriptive. However, this will not dilute the emphasis placed on nativeness and on achieving the right type of woodland for each individual site.

The SSSI selection guidelines (Latham et al, 2018) 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 these criteria.

Notwithstanding this, the SSSI guidelines note that certain distinctive and important types of semi-natural woodland and associated communities, including wet woodland and yew woodland, are unlikely to be contained within ancient woodland sites, so more recent examples will need to be selected. It is also noted that in some areas of the country, most woodland was historically cleared from land highly valued for agriculture and only more recent woodland now exists. These may be the only substantial stands of native woodland and should also be considered for designation.

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 sites should be considered for selection:

- ***all undesignated ancient woodlands, as recorded in the Ancient Woodland Inventory, apart from those felled and replanted with non-native species, which have also entirely lost their ancient features such as characteristic ground flora;***
- ***all undesignated semi-natural woodlands, of whatever size, which support an assemblage* of ancient woodland indicator species (see Table 1 below): * 25 or more for mesotrophic & calcareous woodland, 5 or more for acid woodland;***
- ***all planted/re-planted/naturally regenerated wet woodland with semi-natural ground flora or other areas of interest such as ditches, pools and marshy areas.***

'Ancient woodland' are sites that have been continuously wooded since before 1600AD. Details of these sites can be found on the [2011 Ancient Woodland Inventory](#) which indicates that there are around 95,000ha of ancient woodland in Wales.

'Semi-natural' woodlands contain a high proportion (i.e. $\pm 70\%$ or more) of native, locally-indigenous tree and shrub species, a combination regarded as having the highest nature conservation value (Kirby et al 1984).

Various species can be used to give an indication that a site has been continuously wooded for a considerable length of time. The most commonly used are known as 'ancient woodland indicator species' and these are the most accessible way of using species to determine the ancient status of a wood. Lists of ancient woodland indicators vary in different parts of the UK, yet the more of these species found in a wood, the more likely it is to be ancient. 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. A list of vascular plant indicator species for Powys is provided in Table 1 below. 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.

Criteria for the selection of Local Wildlife Sites in Powys

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.

Table 1 – Powys ancient woodland indicator species

Taxon	Common name
<i>Acer campestre</i>	Field Maple
<i>Adoxa moschatellina</i>	Moschatel
<i>Allium ursinum</i>	Ramsons
<i>Anemone nemorosa</i>	Wood Anemone
<i>Bazzania trilobata</i>	Greater Whipwort
<i>Blechnum spicant</i>	Hard-fern
<i>Bromopsis benekenii</i>	Lesser Hairy-brome
<i>Bromopsis ramosa</i>	Hairy Brome
<i>Campanula latifolia</i>	Giant Bellflower
<i>Campanula trachelium</i>	Nettle-leaved Bellflower
<i>Cardamine impatiens</i>	Narrow-leaved Bitter-cress
<i>Carex elongata</i>	Elongated Sedge
<i>Carex laevigata</i>	Smooth-stalked Sedge
<i>Carex pendula</i>	Pendulous Sedge
<i>Carex remota</i>	Remote Sedge
<i>Carex strigosa</i>	Thin-spiked Wood-sedge
<i>Carex sylvatica</i>	Wood-sedge
<i>Cephalanthera longifolia</i>	Narrow-leaved Helleborine
<i>Ceratocarpus claviculata</i>	Climbing Corydalis
<i>Chrysosplenium alternifolium</i>	Alternate-leaved Golden-saxifrage
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved Golden-saxifrage
<i>Circaea</i> spp.	Enchanter's-nightshades
<i>Conopodium majus</i>	Pignut
<i>Convallaria majalis</i>	Lily of The Valley
<i>Crepis paludosa</i>	Marsh Hawk's-beard
<i>Dicranum majus</i>	Greater Fork-moss
<i>Dioscorea communis</i>	Black Bryony
<i>Dipsacus pilosus</i>	Small Teasel
<i>Dryopteris aemula</i>	Hay-scented Buckler-fern
<i>Dryopteris affinis</i>	Scaly Male Fern
<i>Epipactis helleborine</i>	Broad-leaved Helleborine
<i>Equisetum sylvaticum</i>	Wood Horsetail
<i>Euonymus europaeus</i>	Spindle
<i>Euphorbia amygdaloides</i>	Wood Spurge
<i>Festuca altissima</i>	Wood Fescue
<i>Festuca gigantea</i>	Giant Fescue
<i>Frangula alnus</i>	Alder Buckthorn
<i>Galium odoratum</i>	Woodruff
<i>Geum rivale</i>	Water Avens
<i>Gymnocarpium dryopteris</i>	Oak Fern
<i>Holcus mollis</i>	Creeping Soft-grass
<i>Hordelymus europaeus</i>	Wood Barley
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hymenophyllum wilsonii</i>	Wilson's Filmy Fern
<i>Hypericum androsaemum</i>	Tutsan
<i>Hypericum pulchrum</i>	Slender St John's-wort
<i>Ilex aquifolium</i>	Holly

Criteria for the selection of Local Wildlife Sites in Powys

<i>Lamium galeobdolon</i>	Yellow Archangel
<i>Lathraea squamaria</i>	Toothwort
<i>Lathyrus linifolius</i>	Bitter Vetch
<i>Leucobryum glaucum</i>	Large White-moss
<i>Listera ovata</i>	Common Twayblade
<i>Luzula forsteri</i>	Southern Wood-rush
<i>Luzula pilosa</i>	Hairy Wood-rush
<i>Luzula sylvatica</i>	Great Wood-rush
<i>Lysimachia nemorum</i>	Yellow Pimpernel
<i>Malus sylvestris</i>	Crab Apple
<i>Melampyrum pratense</i>	Common Cow-wheat
<i>Melica nutans</i>	Mountain Melick
<i>Melica uniflora</i>	Wood Melick
<i>Mercurialis perennis</i>	Dog's Mercury
<i>Milium effusum</i>	Wood Millet
<i>Moehringia trinervia</i>	Three-nerved Sandwort
<i>Narcissus pseudonarcissus</i> *	Daffodil*
<i>Neottia nidus-avis</i>	Bird's-nest Orchid
<i>Orchis mascula</i>	Early-purple Orchid
<i>Oreopteris limbosperma</i>	Lemon-scented Fern
<i>Oxalis acetosella</i>	Wood-sorrel
<i>Paris quadrifolia</i>	Herb Paris
<i>Phegopteris connectilis</i>	Beech Fern
<i>Phyllitis scolopendrium</i>	Hart's-tongue
<i>Plagiothecium undulatum</i>	Waved Silk-moss
<i>Platanthera chlorantha</i>	Greater Butterfly-orchid
<i>Poa nemoralis</i>	Wood Meadow-grass
<i>Polygonatum multiflorum</i>	Solomon's-seal
<i>Polygonatum odoratum</i>	Angular Solomon's-seal
<i>Polypodium vulgare</i> agg.	Polypody
<i>Polystichum aculeatum</i>	Hard Shield-fern
<i>Polystichum setiferum</i>	Soft Shield-fern
<i>Populus tremula</i>	Aspen
<i>Primula vulgaris</i>	Primrose
<i>Prunus avium</i> *	Wild Cherry*
<i>Prunus padus</i> *	Bird Cherry*
<i>Quercus petraea</i>	Sessile Oak
<i>Ranunculus auricomus</i>	Goldilocks Buttercup
<i>Rhytidiadelphus loreus/triquetrus</i>	Shaggy-mosses
<i>Rosa arvensis</i>	Field-rose
<i>Sanicula europaea</i>	Sanicle
<i>Sedum telephium</i>	Orpine
<i>Solidago virgaurea</i>	Goldenrod
<i>Sorbus torminalis</i>	Wild Service-tree
<i>Stellaria holostea</i>	Greater Stitchwort
<i>Stellaria neglecta</i>	Greater Chickweed
<i>Stellaria nemorum</i>	Wood Stitchwort
<i>Taxus baccata</i> *	Yew*
<i>Tilia cordata</i>	Small-leaved Lime
<i>Ulmus glabra</i>	Wych Elm
<i>Vaccinium myrtillus</i>	Bilberry
<i>Veronica montana</i>	Wood Speedwell
<i>Viburnum opulus</i>	Guelder Rose
<i>Vicia sylvatica</i>	Wood Vetch
<i>Viola reichenbachiana</i>	Early Dog-violet

* WHERE IT IS BELIEVED TO BE OF NATIVE ORIGIN

Criteria for the selection of Local Wildlife Sites in Powys

H2) BOUNDARY & LINEAR FEATURES

Linear features, such as hedgerows, disused railway lines, green lanes, roadside verges and old drove roads, can be important in providing long corridors of semi-natural habitats, linking sites which might otherwise be isolated. In some cases these represent the last remnants of habitats once much more widespread in our countryside and occasionally they provide a last refuge for rare or threatened species.

Due to their small size, ownership and management complexity, most boundary and linear features would be included as part of Local Wildlife Sites selected under other criteria. However, sites supporting priority species would likely qualify under the relevant species criteria and sites meeting habitat criteria in their own right would be selected as such.

H2.1) HEDGEROWS

Section 7 of the Environment (Wales) Act lists 'Boundary and linear features' as a broad habitat category, within which 'Hedgerows' are identified as a habitat of principle importance for conservation in Wales. Section 7 hedgerows are defined on the [JNCC website](#).

Hedgerow systems and their associated standard trees are often remnants of ancient field boundary layouts and may be of critical value both as linear habitats and as habitat corridors, supporting very large and diverse populations of flora and fauna. Hedges may provide important habitats for the Hazel Dormouse (*Muscardinus avellanarius*).

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

The Hedgerow Regulations 1997 prohibit the removal of most countryside hedgerows without first submitting a hedgerow removal notice to the local planning authority. Local planning authorities are able to order the retention of 'important' hedgerows (but not others). The Regulations set out criteria to be used by the local planning authority in determining which hedgerows are important.

The Hedgerow Survey Handbook (Defra 2007) details a standard procedure for hedgerow survey in the UK. It also takes account of advances in our understanding of what a hedgerow looks like when it is in a good or 'favourable condition' for wildlife.

The following sites should be considered for selection:

- ***All hedgerows \geq 100m in length which also meet at least five of the following criteria:***
 - 1) ***One or more locally important plant species (marked with * in Tables 2 & 3);***
 - 2) ***One or more nationally important species;***
 - 3) ***At least two distinct physical features: bank, wall, ditch or standard trees;***
 - 4) ***At least five of the woody & climbing axiophyte species listed in Table 2;***
 - 5) ***At least three of the woodland ground flora axiophyte species listed in Table 3;***

Criteria for the selection of Local Wildlife Sites in Powys

- 6) **No gaps greater than 10% of the length;**
 7) **At least one connection to other hedges, woodland or scrub.**

'Nationally important' species include species with European and UK Legal Protection, Section 7 and Species of Conservation Concern - Global Red List, British Red Data Book, Nationally Rare & Scarce, and Welsh Red and Amber Birds.

'Axiophytes' are plant species which are indicative of good habitats.

Table 2 – Woody & climbing species found in hedgerows in Powys

Taxon	Common name
<i>Acer campestre</i>	Field Maple
<i>Alnus glutinosa</i>	Alder
<i>Betula pendula</i>	Silver Birch
<i>Betula celtiberica/pubescens</i>	Downy Birch
<i>Bryonia dioica</i>	White Bryony
<i>Clematis vitalba</i>	Traveller's Joy
<i>Cornus sanguinea</i>	Dogwood
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Daphne laureola</i>	Spurge Laurel
<i>Dioscorea communis</i>	Black Bryony
<i>Euonymus europaeus</i>	Spindle
*Frangula alnus	*Alder Buckthorn
<i>Fraxinus excelsior</i>	Ash
<i>Hedera helix</i>	Ivy
<i>Hedera hibernica</i>	Ivy
<i>Humulus lupulus</i>	Hop
<i>Ilex aquifolium</i>	Holly
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Malus sylvestris</i>	Crab Apple
<i>Populus tremula</i>	Aspen
*Populus nigra	*Black Poplar
<i>Prunus avium</i>	Wild Cherry
<i>Prunus padus</i>	Bird Cherry
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus petraea</i>	Sessile Oak
<i>Quercus robur</i>	Pedunculate Oak
<i>Rhamnus cathartica</i>	Buckthorn
<i>Ribes rubrum</i>	Red Currant
<i>Rosa</i> spp.	Rose species
<i>Rubus fruticosus</i> agg.	Bramble
<i>Salix</i> spp.	Willow species
<i>Sambucus nigra</i>	Elder
<i>Solanum dulcamara</i>	Bittersweet
<i>Sorbus aucuparia</i>	Rowan
*Sorbus torminalis	*Wild Service-tree
<i>Taxus baccata</i>	Yew
*Tilia cordata	*Small-leaved Lime
*Tilia platyphyllos	*Large-leaved Lime
<i>Ulex gallii</i>	Western Gorse
<i>Ulmus</i> spp.	Elm species
<i>Viburnum opulus</i>	Guelder Rose

* RARE/SCARCE WOODY PLANT SPECIES FOUND IN HEDGEROWS IN POWYS

Table 3 – Ground flora species found in hedgerows in Powys

Taxon	Common name
<i>Adoxa moschatellina</i>	Moschatel
<i>Ajuga reptans</i>	Bugle
<i>Alliaria petiolata</i>	Garlic Mustard
<i>Allium ursinum</i>	Ramsons
<i>Anemone nemorosa</i>	Wood Anemone
<i>Arum maculatum</i>	Lords-and-ladies
<i>Athyrium filix-femina</i>	Lady Fern
<i>Blechnum spicant</i>	Hard-fern
<i>Brachypodium sylvaticum</i>	False Brome
*Bromopsis benekenii	*Lesser Hairy-brome
<i>Bromopsis ramosa</i>	Hairy Brome
*Campanula latifolia	*Giant Bellflower
*Campanula patula	*Spreading Bellflower
<i>Campanula trachelium</i>	Nettle-leaved Bellflower
<i>Cardamine impatiens</i>	Narrow-leaved Bitter-cress
<i>Carex pallescens</i>	Pale Sedge
<i>Carex spicata</i>	Spiked Sedge
<i>Carex strigosa</i>	Thin-spiked Wood-sedge
<i>Carex sylvatica</i>	Wood-sedge
<i>Circaea lutetiana</i>	Enchanter's Nightshade
<i>Cirsium heterophyllum</i>	Melancholy Thistle
*Colchicum autumnale	*Meadow Saffron
<i>Conopodium majus</i>	Pignut
<i>Cruciata laevipes</i>	Crosswort
<i>Dryopteris affinis</i>	Scaly Male Fern
<i>Dryopteris dilatata</i>	Broad Buckler-fern
<i>Dryopteris filix-mas</i>	Male Fern
<i>Epipactis helleborine</i>	Broad-leaved Helleborine
<i>Equisetum sylvaticum</i>	Wood Horsetail
<i>Equisetum telmateia</i>	Great Horsetail
*Euphorbia amygdaloides	*Wood Spurge
<i>Festuca gigantea</i>	Giant Fescue
<i>Fragaria vesca</i>	Wild Strawberry
<i>Galium odoratum</i>	Woodruff
<i>Geranium robertianum</i>	Herb Robert
<i>Geum rivale</i>	Water Avens
<i>Geum urbanum</i>	Wood Avens
<i>Glechoma hederacea</i>	Ground Ivy
<i>Helleborus viridis</i>	Green Hellebore
<i>Hieracium</i> spp.	Hawkweed species
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hypericum pulchrum</i>	Slender St John's-wort
<i>Jasione montana</i>	Sheep's Bit
<i>Lamium galeobdolon</i>	Yellow Archangel
*Lathraea squamaria	*Toothwort
<i>Listera ovata</i>	Common Twayblade
<i>Luzula forsteri</i>	Southern Wood-rush
<i>Luzula pilosa</i>	Hairy Wood-rush
<i>Luzula sylvatica</i>	Great Wood-rush
<i>Lysimachia nemorum</i>	Yellow Pimpernel
<i>Lysimachia nummularia</i>	Creeping-jenny
<i>Melampyrum pratense</i>	Common Cow-wheat
<i>Melica uniflora</i>	Wood Melick
<i>Mercurialis perennis</i>	Dog's Mercury

Criteria for the selection of Local Wildlife Sites in Powys

<i>Milium effusum</i>	Wood Millet
<i>Moehringia trinervia</i>	Three-nerved Sandwort
<i>Mycelis muralis</i>	Wall Lettuce
<i>Orchis mascula</i>	Early-purple Orchid
<i>Oxalis acetosella</i>	Wood-sorrel
*Paris quadrifolia	*Herb Paris
<i>Phyllitis scolopendrium</i>	Hart's-tongue
<i>Poa nemoralis</i>	Wood Meadow-grass
<i>Polypodium vulgare</i> agg.	Polypody
<i>Polystichum aculeatum</i>	Hard Shield-fern
<i>Polystichum setiferum</i>	Soft Shield-fern
<i>Potentilla sterilis</i>	Barren Strawberry
<i>Primula vulgaris</i>	Primrose
<i>Ranunculus auricomus</i>	Goldilocks Buttercup
<i>Sanicula europaea</i>	Sanicle
<i>Saxifraga granulata</i>	Meadow Saxifrage
<i>Silene dioica</i>	Red Campion
<i>Solidago virgaurea</i>	Goldenrod
<i>Stellaria holostea</i>	Greater Stitchwort
<i>Stellaria neglecta</i>	Greater Chickweed
<i>Teucrium scorodonia</i>	Wood Sage
<i>Umbilicus rupestris</i>	Navelwort
<i>Veronica montana</i>	Wood Speedwell
<i>Viola odorata</i>	Sweet Violet
<i>Viola reichenbachiana</i>	Early Dog-violet
<i>Viola riviniana</i>	Common Dog-violet

* RARE/SCARCE GROUND FLORA SPECIES FOUND IN HEDGEROWS IN POWYS

H2.2) ROAD VERGES

Road verges are not listed as a priority habitat on Section 7 of the Environment (Wales) Act 2016, nor were they covered by the 1999 Powys Local Wildlife Sites system. However, rural road verges within Powys, like much of the UK, are invaluable wildlife habitat. The post-1940s promotion of intensive land management practices means road verges are often the last refuges of flora and fauna now lost from the wider countryside. Their linear nature provides a county-wide network of corridors helping wildlife to move through the landscape and maintain contact between individuals and otherwise isolated populations.

Road verge habitats continue to face a number of threats. Modern management methods have often resulted in a deterioration of habitat quality and the loss of biodiversity interest. Cuttings (known as 'arisings') are left to lie on verges, which act as a mulch suppressing the growth of desirable plant species. Nutrient enrichment from arisings, as well as agricultural run-off and atmospheric deposition, encourages growth of coarser, less desirable species which out-compete more desirable species for light, water, space and/or nutrients. Although road sweepings are no longer deposited on road verges, localised damage to sensitive sites can be caused through piling up of chipped wood material and road salt, as well as deposition of materials from ditch clearance work and inappropriate use of herbicides. Considerable lengths of biodiversity-rich verge can be significantly damaged or lost entirely by road widening schemes or installation of French drains.

Since 2001, Powys has operated a 'Road Verge Nature Reserve' (RVNR) system. An RVNR is a length of road verge that has been identified as having particular value to wildlife and is subsequently managed by Powys County Council (PCC) with the aim of conserving and enhancing those features of interest. More specifically, RVNR designation serves to:

Criteria for the selection of Local Wildlife Sites in Powys

- highlight its wildlife value within a local and/or national context, particularly as an important repository of species associated with declining semi-natural habitats;
- recognise its importance as a 'wildlife corridor' in linking otherwise isolated semi-natural habitats;
- secure the most appropriate management regime for conserving the site's biodiversity interest, wherever possible.

The RVNR designation affords the site no legal protection *per se* but serves to highlight the site's biodiversity importance to local authority staff and contractors. The selection of road verges as Local Wildlife Sites does not replace the RVNR system, but rather complements it. Indeed, this LWS selection criteria is based on the RVNR system. There is likely to be significant overlap between the two 'designations', but this is not considered a problem, as their purposes are different. Local Wildlife Site selection provides the opportunity to provide a greater level of protection for Powys' most important road verges.

The following sites should be considered for selection:

- ***all undesignated road verges supporting one or more nationally important species, recorded as present at least twice within the previous five years*;***
- ***all undesignated road verges supporting one or more locally important species, recorded as present at least twice within the previous five years*;***
- ***all undesignated road verges with at least 10 species typical for the habitat type#, per 10m length, for at least 50% of the total length surveyed;***
- ***all undesignated road verges of contiguous habitat adjacent to designated sites.***

*On road verges, this will primarily be vascular plants, bryophytes, lichens or fungi. Animal species are often highly mobile, meaning that road verges typically do not form vital habitat in their own right, but rather contribute to a wider ecological landscape and aid connectivity. However, there may be exceptions to this, in which case advice should be sought from a relevant local expert.

#When assessing road verges for species richness, the reference table(s) for the appropriate habitat should be used. For example, if the road verge is of a neutral grassland type, there should be at least 10 species from Table 4 present per 10m length, for at least 50% of the total length surveyed.

'Nationally important' species include species with European and UK Legal Protection, Section 7 and Species of Conservation Concern - Global Red List, British Red Data Book, Nationally Rare & Scarce.

'Locally important' species are those considered rare or scarce on a local level, or considered of concern due to declines in range or population locally. In the former case, they are likely to be found in 10 or fewer sites across each vice-county. In the case of vascular plants, they will be classified 'locally rare' or 'locally scarce' within County Rare Plant Registers. The Local Environmental Record Centre for Powys (Biodiversity Information Service for Powys & Brecon Beacons National Park (BIS)) is currently compiling an up to date list of Locally Important species for the area. Until this is complete, advice should be sought from relevant local experts.

Criteria for the selection of Local Wildlife Sites in Powys

Defining the boundaries of a road verge LWS will be similar as for all LWS, but should only include the width of the highway 'soft estate', i.e. the vegetated area lying between the edge of the tarmacadam road surface and the nearest boundary feature; the latter may be included in some cases, where relevant, for example a hedgerow, tree(s) or wall may form part of the habitat. A road verge forming contiguous habitat immediately adjacent to a LWS, should be included in the site boundary for that LWS.

H3) NEUTRAL GRASSLAND

Semi-natural neutral grasslands, while being widespread across lowland Britain, are collectively very scarce and fragmented as they have been a particular focus for agricultural improvement. It is estimated that significantly less than 15,000 hectares remain in Great Britain (Jefferson et al 2014).

Of those neutral grasslands found in Powys, the following are identified by the SSSI Lowland Grassland Selection Guidelines (Jefferson et al., 2014) as having high botanical conservation value:

- MG1 c & e – *Arrhenatherum elatius* grassland
- MG4 – *Alopecurus pratensis* – *Sanguisorba officinalis* grassland
- MG5 – *Cynosurus cristatus* – *Centaurea nigra* grassland
- MG7c-related *Alopecurus pratensis* – *Poa trivialis* – *Cardamine pratensis* floodplain grassland
- MG8 – *Cynosurus cristatus* – *Caltha palustris* grassland and related vegetation

Other types, although of lower botanical interest, could be of value where rare plants/assemblages are found, or where they form a contiguous habitat with higher value grassland.

Section 7 of the Environment (Wales) Act lists 'Lowland Meadows' and 'Upland hay meadows' under the broad category of 'Neutral grassland'. Upland hay meadows refer almost entirely to NVC community MG3, *Anthoxanthum odoratum* - *Geranium sylvaticum* grassland, which, for the most part, are restricted to upland valleys in the north of England, with outliers in Scotland. Definitions of both these habitat types is available on the [JNCC website](#).

H3.1) LOWLAND MEADOWS

This priority habitat, as defined by the JNCC, includes most forms of unimproved neutral grassland across the enclosed lowland landscapes of the UK. In Powys some of these enclosed landscapes may occur at higher altitudes, however for the purposes of this criteria all enclosed neutral grasslands are considered under H3.1. In terms of National Vegetation Classification (NVC) plant communities, they primarily embrace each type of MG4, MG5 and MG8. Both MG4 and MG8 are very scarce habitats in Wales; any examples in Powys will be significant.

Lowland meadows does not only apply to grasslands cut for hay, but also takes into account unimproved neutral pastures where livestock grazing is the main land use. On many farms in different parts of the UK, use of particular fields for grazing pasture and hay cropping changes over time, but the characteristic plant community may persist with subtle changes in floristic composition. In non-agricultural settings, such grasslands are less frequent but additional examples may be found in recreational sites, burial grounds, roadside verges and a variety of other localities.

Excluded from 'Lowland Meadows' are maritime grassland communities, confined to coastal habitats and MG3 grasslands, which are not found in Powys. *Molinia-Juncus* pastures are covered in Purple Moor Grass and Rush Pastures H7.3 - Purple Moorgrass and Rush Pastures.

The following sites should be considered for selection:

- all undesignated MG4 or MG8 grasslands;
- all undesignated MG5 grasslands ≥ 0.5 ha;
- all species-rich (supporting 15 or more species from Table 4) neutral grasslands ≥ 0.5 ha;
- all undesignated neutral grasslands that contain one or more of the uncommon species marked with * in Table 4;
- all undesignated semi-improved neutral grasslands ≥ 0.5 ha in good conservation management that are immediately adjacent and form contiguous habitat with neutral grassland of high botanical value, such as SSSIs, nature reserves or existing LWS.

Table 4 – vascular plants found in unimproved lowland neutral grassland in Powys

<i>Agrimonia eupatoria</i>	Agrimony
<i>Agrimonia procera</i>	Fragrant Agrimony
<i>Ajuga reptans</i>	Bugle
<i>Alchemilla</i> spp. (NOT <i>mollis</i>)	Lady's mantles
<i>Anemone nemorosa</i>	Wood Anemone
<i>Briza media</i>	Quaking-grass
<i>Bromus commutatus</i>	Meadow Brome
*<i>Bromus racemosus</i>	*Smooth Brome
<i>Caltha palustris</i>	Marsh Marigold
<i>Cardamine pratensis</i>	Cuckoo Flower
<i>Carex caryophyllea</i>	Spring Sedge
*<i>Carex disticha</i>	*Brown Sedge
<i>Carex flacca</i>	Glaucous Sedge
<i>Carex muricata</i>	Prickly Sedge
<i>Carex pallescens</i>	Pale Sedge
<i>Carex panicea</i>	Carnation Sedge
<i>Centaurea nigra</i>	Common Knapweed
*<i>Colchicum autumnale</i>	*Meadow Saffron
<i>Conopodium majus</i>	Pignut
<i>Dactylorhiza</i> spp.	Spotted-orchids
<i>Danthonia decumbens</i>	Heath-grass
<i>Euphrasia officinalis</i> agg.	Eyebright
<i>Festuca arundinacea</i>	Tall Fescue
<i>Festuca pratensis</i>	Meadow Fescue
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Galium verum</i>	Lady's Bedstraw
*<i>Genista anglica</i>	*Petty Whin
*<i>Genista tinctoria</i>	*Dyer's Greenweed
<i>Geranium pratense</i>	Meadow Crane's-bill
*<i>Geranium sylvaticum</i>	*Wood Crane's-bill
*<i>Gymnadenia conopsea</i> subsp. borealis	*Heath Fragrant-orchid
*<i>Hordeum secalinum</i>	*Meadow Barley
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hypericum hirsutum</i>	Hairy St John's-wort
<i>Hypericum maculatum</i>	Imperforate St John's-wort
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Lathyrus pratensis</i>	Meadow Vetchling
<i>Leontodon autumnalis</i>	Autumn Hawkbit
<i>Leontodon hispidus</i>	Rough Hawkbit

Criteria for the selection of Local Wildlife Sites in Powys

<i>Leucanthemum vulgare</i>	Ox-eye Daisy
<i>Linum catharticum</i>	Fairy Flax
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil
<i>Luzula campestris</i>	Field Wood-rush
*<i>Ononis repens</i>	*Common Restharrow
*<i>Ophioglossum vulgatum</i>	*Adder's-tongue
*<i>Orchis morio</i>	*Green-winged Orchid
<i>Persicaria bistorta</i>	Common Bistort
<i>Pilosella officinarum</i>	Mouse-ear-hawkweed
<i>Pimpinella saxifraga</i>	Burnet-saxifrage
*<i>Platanthera bifolia</i>	*Lesser Butterfly-orchid
*<i>Platanthera chlorantha</i>	*Greater Butterfly-orchid
*<i>Poa angustifolia</i>	*Narrow-leaved Meadow-grass
<i>Polygala vulgaris</i>	Common Milkwort
<i>Potentilla anglica</i>	Trailing Tormentil
<i>Potentilla erecta</i>	Tormentil
<i>Primula veris</i>	Cowslip
<i>Ranunculus bulbosus</i>	Bulbous Buttercup
<i>Rhinanthus minor</i>	Yellow Rattle
*<i>Sanguisorba officinalis</i>	*Great Burnet
<i>Saxifraga granulata</i>	Meadow Saxifrage
<i>Serratula tinctoria</i>	Saw-wort
*<i>Silaum silaus</i>	*Pepper-saxifrage
<i>Stachys officinalis</i>	Betony
<i>Stellaria graminea</i>	Lesser Stitchwort
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Trifolium medium</i>	Zigzag Clover
<i>Trifolium pratense</i>	Red Clover
<i>Trisetum flavescens</i>	Yellow Oat-grass
<i>Vicia cracca</i>	Tufted Vetch
*<i>Vicia orobus</i>	*Wood Bitter-vetch

* VASCULAR PLANT SPECIES OF UNIMPROVED NEUTRAL GRASSLANDS WITH A RESTRICTED DISTRIBUTION IN POWYS

H4) CALCAREOUS GRASSLANDS

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 Wild Thyme (*Thymus polytrichus*), Common Rock-rose (*Helianthemum nummularium*), Fairy Flax (*Linum catharticum*) and Salad Burnet (*Sanguisorba minor*).

Section 7 of the Environment (Wales) Act lists 'Lowland calcareous grassland' and 'Upland calcareous grassland' under the broad category of 'Calcareous grassland'. Definitions of both these habitat types is available on the [JNCC website](#).

It is considered that all relatively diverse calcareous grasslands should be considered for selection as Local Wildlife Sites; they are generally the most diverse grassland type in terms of wildflowers and grasses and are uncommon in Powys. 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 criteria should be applied equally to habitats regardless of their origins.

The following sites should be considered for selection:

- **all undesignated unimproved lowland or upland calcareous grassland;**
- **all undesignated semi-improved calcareous grasslands containing 8 or more species from Table 5 below.**

'Semi-improved' grasslands include those swards which have been degraded by agricultural management but which are still recognisably derived from calcareous grassland. Only those semi-improved sites that are 'species-rich' should be considered for selection as a Local Wildlife Site.

Table 5 – vascular plants found in calcareous grassland in Powys

<i>Agrimonia eupatoria</i>	Agrimony
<i>Agrimonia procera</i>	Fragrant Agrimony
<i>Aira</i> spp.	Hair-grasses
<i>Allium vineale</i>	Wild Onion
<i>Anacamptis pyramidalis</i>	Pyramidal Orchid
<i>Antennaria dioica</i>	Mountain Everlasting
<i>Anthyllis vulneraria</i>	Kidney Vetch
<i>Aphanes</i> agg.	Parsley-pierts
<i>Arabis hirsuta</i>	Hairy Rock-cress
<i>Arenaria serpyllifolia</i>	Thyme-leaved Sandwort
<i>Blackstonia perfoliata</i>	Yellow-wort
<i>Brachypodium pinnatum</i>	Heath False-brome
<i>Briza media</i>	Quaking-grass
<i>Bromopsis erecta</i>	Upright Brome
<i>Campanula glomerata</i>	Clustered Bellflower
<i>Campanula rotundifolia</i>	Harebell
<i>Carduus nutans</i>	Musk Thistle
<i>Carex caryophyllea</i>	Spring Sedge

Criteria for the selection of Local Wildlife Sites in Powys

<i>Carex flacca</i>	Glaucous Sedge
<i>Carex montana</i>	Soft-leaved Sedge
<i>Carlina vulgaris</i>	Carlina Thistle
<i>Catapodium rigidum</i>	Fern-grass
<i>Centaurea scabiosa</i>	Greater Knapweed
<i>Centaureum erythraea</i>	Common Centaury
<i>Cirsium acaule</i>	Dwarf Thistle
<i>Cirsium eriophorum</i>	Woolly Thistle
<i>Clinopodium ascendens</i>	Common Calamint
<i>Clinopodium vulgare</i>	Wild Basil
<i>Dactylorhiza fuchsia</i>	Common Spotted-orchid
<i>Dactylorhiza viridis</i>	Frog Orchid
<i>Danthonia decumbens</i>	Heath-grass
<i>Daucus carota</i>	Wild Carrot
<i>Dianthus deltoids</i>	Maiden Pink
<i>Echium vulgare</i>	Viper's Bugloss
<i>Erigeron acris</i>	Blue Fleabane
<i>Erodium cicutarium</i>	Common Stork's-bill
<i>Erophila</i> spp.	Whitlowgrasses
<i>Euphrasia officinalis</i> agg.	Eyebright
<i>Filipendula vulgaris</i>	Dropwort
<i>Galium mollugo</i>	Hedge Bedstraw
<i>Galium sternerii</i>	Limestone Bedstraw
<i>Galium verum</i>	Lady's Bedstraw
<i>Gentianella amarella</i>	Autumn Gentian
<i>Geranium columbinum</i>	Long-stalked Crane's-bill
<i>Geranium sanguineum</i>	Bloody Crane's-bill
<i>Gymnadenia conopsea</i>	Fragrant Orchid
<i>Helianthemum nummularium</i>	Common Rock-rose
<i>Helictotrichon pratensis</i>	Meadow Oat-grass
<i>Helictotrichon pubescens</i>	Downy Oat-grass
<i>Hypericum hirsutum</i>	Hairy St John's-wort
<i>Hypericum montanum</i>	Pale St John's-wort
<i>Hypericum perforatum</i>	Perforate St John's-wort
<i>Inula conyzae</i>	Ploughman's Spikenard
<i>Knautia arvensis</i>	Field Scabious
<i>Koeleria macrantha</i>	Crested Hair-grass
<i>Lathyrus nissolia</i>	Grass Vetchling
<i>Leontodon hispidus</i>	Rough Hawkbit
<i>Leontodon saxatilis</i>	Lesser Hawkbit
<i>Linum catharticum</i>	Fairy Flax
<i>Listera ovata</i>	Common Twayblade
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Lychnis viscaria</i>	Sticky Catchfly
<i>Medicago lupulina</i>	Black Medick
<i>Moenchia erecta</i>	Upright Chickweed
<i>Myosotis ramosissima</i>	Early Forget-me-not
<i>Ononis repens</i>	Common Restharrow
<i>Ononis spinose</i>	Spiny Restharrow
<i>Ophrys apifera</i>	Bee Orchid
<i>Orchis mascula</i>	Early-purple Orchid
<i>Orchis morio</i>	Green-winged Orchid
<i>Origanum vulgare</i>	Wild Marjoram
<i>Pastinaca sativa</i>	Wild Parsnip
<i>Picris hieracioides</i>	Hawkweed Ox-tongue
<i>Pilosella officianum</i>	Mouse-ear Hawkweed
<i>Pilosella peleteriana</i> subsp. <i>subpeleteriana</i>	Shaggy Mouse-ear Hawkweed
<i>Pimpinella saxifraga</i>	Burnet-saxifrage

Criteria for the selection of Local Wildlife Sites in Powys

<i>Plantago media</i>	Hoary Plantain
<i>Poa angustifolia</i>	Narrow-leaved Meadow-grass
<i>Polygala vulgaris</i>	Common Milkwort
<i>Potentilla tabernaemontani</i>	Spring Cinquefoil
<i>Primula veris</i>	Cowslip
<i>Ranunculus bulbosus</i>	Bulbous Buttercup
<i>Sagina nodosa</i>	Knotted Pearlwort
<i>Sanguisorba minor</i>	Salad Burnet
<i>Saxifraga tridactylites</i>	Rue-leaved Saxifrage
<i>Scabiosa columbaria</i>	Small Scabious
<i>Sedum forsterianum</i>	Rock Stonecrop
<i>Senecio erucifolius</i>	Hoary Ragwort
<i>Serratula tinctoria</i>	Saw-wort
<i>Sherardia arvensis</i>	Field Madder
<i>Spiranthes spiralis</i>	Autumn Lady's-tresses
<i>Stellaria pallida</i>	Lesser Chickweed
<i>Teesdalia nudicaulis</i>	Shepherd's Cress
<i>Thalictrum minus</i>	Lesser Meadow-rue
<i>Thymus polytrichus</i>	Wild Thyme
<i>Thymus pulegioides</i>	Large Garden
<i>Torilis nodosa</i>	Knotted Hedge-parsley
<i>Trifolium campestre</i>	Hop Trefoil
<i>Trifolium scabrum</i>	Rough Clover
<i>Trifolium striatum</i>	Knotted Clover
<i>Trisetum flavescens</i>	Yellow Oat-grass
<i>Veronica spicata</i>	Spiked Speedwell
<i>Viola hirta</i>	Hairy Violet

H5) ACID GRASSLAND

Acid grasslands are comparatively scarce in the lowlands, being largely restricted to areas of nutrient-poor acidic soils. 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 plants, as well as a range of other wildlife including scarce or rare species.

Section 7 of the Environment (Wales) Act lists 'Lowland dry acid grassland' under the broad category of 'Acid grassland'. The definition of both this habitat type is available on the [JNCC website](#).

H5.1) LOWLAND DRY ACID GRASSLAND

Lowland dry acid grassland is defined as comprising grassland NVC communities U1-U3 and U4 below 300m, although in some cases these enclosures may extend up to 400m. Occurrences of this habitat on roadside verges are also covered by the definition.

Of those communities found in Powys, the 'Lowland Grasslands' SSSI selection criteria (Jefferson et al., 2014) identifies the following as having high botanical nature conservation value:

- U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland
- U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland
- U5 *Nardus stricta-Galium saxatile* grassland

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 (*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*).

The following sites should be considered for selection:

- **all undesignated lowland dry acid grasslands with 7 or more vascular plant species from Table 9 below.**

Table 6 – vascular plants found in lowland dry acid grassland in Powys

<i>Achillea millefolium</i>	Yarrow
<i>Agrostis canina</i>	Velvet Bent
<i>Aira</i> spp.	Hair-grasses
<i>Alchemilla</i> spp. (NOT <i>mollis</i>)	Lady's mantles
<i>Anemone nemorosa</i>	Wood Anemone
<i>Aphanes</i> agg.	Parsley-pierts
<i>Arenaria serpyllifolia</i>	Thyme-leaved Sandwort
<i>Botrychium lunaria</i>	Moonwort
<i>Briza media</i>	Quaking-grass

Criteria for the selection of Local Wildlife Sites in Powys

<i>Calluna vulgaris</i>	Heather
<i>Campanula rotundifolia</i>	Harebell
<i>Carex montana</i>	Soft-leaved Sedge
<i>Carex nigra</i>	Common Sedge
<i>Carex panicea</i>	Carnation Sedge
<i>Carex pilulifera</i>	Pill Sedge
<i>Carex pulicaris</i>	Flea Sedge
<i>Carex viridula subsp. oedocarpa</i>	Common Yellow Sedge
<i>Carum verticillatum</i>	Whorled Caraway
<i>Cerastium semidecandrum</i>	Little Mouse-ear
<i>Cladonia</i> spp.	Cladonia lichens
<i>Conopodium majus</i>	Pignut
<i>Dactylorhiza maculata</i>	Heath Spotted-orchid
<i>Danthonia decumbens</i>	Heath-grass
<i>Deschampsia flexuosa</i>	Wavy Hair-grass
<i>Dianthus deltoides</i>	Maiden Pink
<i>Dicranum scoparium</i>	Broom Fork-moss
<i>Erica cinerea</i>	Bell Heather
<i>Erica tetralix</i>	Cross-leaved Heath
<i>Erodium cicutarium</i>	Common Stork's-bill
<i>Erophila</i> agg.	Whitlowgrasses
<i>Euphrasia</i>	Eyebright species
<i>Festuca ovina</i> agg.	Sheep's Fescue
<i>Filago minima</i>	Small Cudweed
<i>Galium saxatile</i>	Heath Bedstraw
<i>Galium verum</i>	Lady's Bedstraw
<i>Genista anglica</i>	Petty Whin
<i>Geranium molle</i>	Dove's-foot Crane's-bill
<i>Gymnadenia conopsea subsp. borealis</i>	Heath Fragrant-orchid
<i>Hieracium</i> spp.	Hawkweed species
<i>Hypericum humifusum</i>	Trailing St John's-wort
<i>Hypericum pulchrum</i>	Slender St John's-wort
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Jasione montana</i>	Sheep's Bit
<i>Lathyrus linifolius</i>	Bitter Vetch
<i>Leontodon autumnalis</i>	Autumn Hawkbit
<i>Leontodon saxatilis</i>	Lesser Hawkbit
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Luzula campestris</i>	Field Wood-rush
<i>Luzula multiflora</i>	Heath Wood-rush
<i>Moenchia erecta</i>	Upright Chickweed
<i>Myosotis discolor</i>	Changing Forget-me-not
<i>Myosotis ramosissima</i>	Early Forget-me-not
<i>Nardus stricta</i>	Mat-grass
<i>Ophioglossum vulgatum</i>	Adder's-tongue
<i>Ornithopus perpusillus</i>	Bird's-foot
<i>Pedicularis sylvatica</i>	Lousewort
<i>Pilosella officianum</i>	Mouse-ear Hawkweed
<i>Pilosella peleteriana subsp. subpeleteriana</i>	Shaggy Mouse-ear Hawkweed
<i>Pimpinella saxifraga</i>	Burnet-saxifrage
<i>Platanthera bifolia</i>	Lesser Butterfly-orchid
<i>Polygala serpyllifolia</i>	Heath Milkwort
<i>Potentilla anglica</i>	Trailing Tormentil
<i>Potentilla argentea</i>	Hoary Cinquefoil
<i>Potentilla erecta</i>	Tormentil
<i>Pseudorchis albida</i>	Small-white Orchid
<i>Rumex acetosella</i>	Sheep's Sorrel
<i>Sedum anglicum</i>	English Stonecrop

Criteria for the selection of Local Wildlife Sites in Powys

<i>Senecio sylvaticus</i>	Heath Groundsel
<i>Spergularia rubra</i>	Sand Spurrey
<i>Stachys officinalis</i>	Betony
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Teesdalia nudicaulis</i>	Shepherd's Cress
<i>Thymus polytrichus</i>	Wild Thyme
<i>Trifolium dubium</i>	Lesser Trefoil
<i>Trifolium micranthum</i>	Slender Trefoil
<i>Trifolium striatum</i>	Knotted Clover
<i>Veronica officinalis</i>	Heath Speedwell
<i>Vicia orobus</i>	Wood Bitter-vetch
<i>Viola canina</i>	Heath Dog-violet
<i>Viola lutea</i>	Mountain Pansy
<i>Viola riviniana</i>	Common Dog-violet
<i>Vulpia bromoides</i>	Squirrel-tail Fescue
<i>Wahlenbergia hederacea</i>	Ivy-leaved Bellflower

H5.2) UPLAND ACID GRASSLANDS

Upland is defined as land above the level of agricultural enclosure, which is generally above 250 – 300m in Wales. Upland acid grassland is characterised by vegetation dominated by grasses and herbs. It is found on a range of usually lime-deficient soils, which have been derived from acid rocks such as sandstones and acid igneous rocks and on superficial deposits such as sands and gravels. Acid grassland dominates large areas of upland Wales, particularly where there has been a history of heavy grazing which has reduced the cover of ericoid species, which would otherwise dominate this habitat, once the tree cover had been removed.

Often species-poor, with limited biodiversity interest, upland acid grassland does not feature as a priority habitat under Section 7 of the Environment (Wales) Act 2016. Upland acid grassland can nevertheless contribute to the overall conservation interest of upland habitats, where it is best considered as part of a mosaic site (see section H12). Being typically unploughed and un-fertilised land, these habitats can form the essential building blocks for nature's recovery and can also support a characteristic fauna, such as Curlew, Snipe, Wheatear and Skylark and short-grazed areas can be of great importance for grassland fungi. Some unimproved upland acid grassland communities, however, have a high botanical value and should be selected as detailed below.

Rhos pasture is also a common upland acid grassland community, but has its own selection criteria under 'Purple Moorgrass & Rush Pastures', section H7.3.

The following sites should be considered for selection:

- **all undesignated upland acid grasslands containing one or more of the species listed in Table 7.**

Table 7 – plant species found in upland acid grassland with restricted distribution in Powys

<i>Antennaria dioica</i>	Mountain Everlasting
<i>Botrychium lunaria</i>	Moonwort

Criteria for the selection of Local Wildlife Sites in Powys

<i>Carex bigelowii</i>	Stiff Sedge
<i>Diphasiastrum alpinum</i>	Alpine Clubmoss
<i>Festuca vivipara</i>	Viviparous Sheep's-fescue
<i>Galium boreale</i>	Northern Bedstraw
<i>Huperzia selago</i>	Fir Clubmoss
<i>Hylocomium splendens</i>	Glittering Wood-moss
<i>Listera cordata</i>	Lesser Twayblade
<i>Lycopodium clavatum</i>	Stag's-horn Clubmoss
<i>Platanthera bifolia</i>	Lesser Butterfly-orchid
<i>Pseudorchis albida</i>	Small-white Orchid
<i>Orthilia secunda</i>	Serrated Wintergreen
<i>Salix herbacea</i>	Dwarf Willow
<i>Saxifraga hypnoides</i>	Mossy Saxifrage
<i>Saxifraga oppositifolia</i>	Purple Saxifrage
<i>Selaginella selaginoides</i>	Lesser Clubmoss

H6) DWARF SHRUB HEATH

Section 7 of the Environment (Wales) Act 2016 identifies 'Lowland heathland' and 'Upland heathland' under the broad category of 'Dwarf shrub heath'. Definitions of both these habitat types is available on the [JNCC website](#). Broadly, heathland is characterised by the presence of dwarf shrubs at a cover of at least 25%. Blanket bog vegetation may also contain substantial amounts of dwarf shrubs, but is distinguished from heathland by its occurrence on deep peat (>0.5m).

The following heathland communities of high priority for nature conservation occur within Powys:

- H8 *Calluna vulgaris-Ulex gallii* heath
- H9 *Calluna vulgaris-Deschampsia flexuosa* heath
- H10 *Calluna vulgaris-Erica cinerea* heath
- H12 *Calluna vulgaris-Vaccinium myrtillus* heath
- H18 *Vaccinium myrtillus-Deschampsia flexuosa* heath
- H21 *Calluna vulgaris-Vaccinium myrtillus-Sphagnum capillifolium* heath
- M15 *Scirpus cespitosus-Erica tetralix* wet heath
- M16 *Erica tetralix* wet heath

H6.1) LOWLAND HEATHLAND

Lowland heathland is generally found below 250-300m on nutrient-poor soils. Once a relatively widespread lowland habitat in historic times, lowland heathland has decreased enormously due to various human impacts, including agricultural reclamation, afforestation and urban development. Some have scrubbed over or been converted to birch or Scots Pine woodland through natural succession, in the absence of grazing or other management. The decline in the UK is estimated to be of the order of 85% in the last 200 years.

In Powys, lowland heathland usually only remains on the lower slopes of hills where it forms part of an altitudinal zonation of vegetation types from valley bottom, to lowland heath, to upland heath. It is only the altitude that leads to the distinction between upland and lowland heath, although lowland heath supports a range of birds, reptiles and invertebrates not found on upland heath. Lowland heath may be classified as dry or wet, depending on soil moisture content. Although usually quite distinct, transitions between dry and wet heath are common.

The following sites should be considered for selection:

- **all undesignated lowland wet or dry heathland;**
- **all undesignated degraded lowland wet or dry heathland with $\geq 10\%$ cover of dwarf heath species, comprising three or more of the following:**
 - ***Calluna vulgaris* (Heather)**
 - ***Empetrum nigrum* (Crowberry)**
 - ***Erica tetralix* (Cross-leaved Heath)**
 - ***Erica cinerea* (Bell Heather)**
 - ***Ulex gallii* (Western Gorse)**
 - ***Vaccinium myrtillus* (Bilberry)**
 - ***Vaccinium vitis-idaea* (Cowberry)**

H6.2) UPLAND HEATHLAND

Wet and dry upland heathland is generally found above 250-300m, above the upper edge of enclosed agricultural land and is widespread in Powys. Upland heath in 'favourable condition' is typically dominated by a range of dwarf shrubs such as Heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Crowberry (*Empetrum nigrum*), Bell Heather (*Erica cinerea*) and Western Gorse (*Ulex gallii*). They are structurally diverse, containing stands of vegetation with heather at different stages of growth. Wet heath in 'favourable condition', should be dominated by mixtures of Cross-leaved Heath (*Erica tetralix*), Deergrass (*Trichophorum germanicum*), Heather and Purple Moor-grass (*Molinia caerulea*), over an understorey of mosses, often including carpets of *Sphagnum* species.

The following sites should be considered for selection:

- **all undesignated dry or wet upland heathland \geq 5ha;**
- **all undesignated degraded upland wet or dry heathland \geq 5ha with \geq 10% cover of dwarf heath species, comprising three or more of the following:**
 - ***Calluna vulgaris* (Heather)**
 - ***Empetrum nigrum* (Crowberry)**
 - ***Erica tetralix* (Cross-leaved Heath)**
 - ***Erica cinerea* (Bell Heather)**
 - ***Ulex gallii* (Western Gorse)**
 - ***Vaccinium myrtillus* (Bilberry)**
 - ***Vaccinium vitis-idaea* (Cowberry)**

H7) FEN, MARSH AND SWAMP

Section 7 of the Environment (Wales) Act 2016 identifies the following priority habitats under the broad category of 'Fen, marsh and swamp':

- Upland flushes, fens and swamps
- Lowland fens
- Purple moorgrass and rush pastures
- Reedbeds

Definitions of these habitat types is available on the [JNCC website](#).

H7.1) UPLAND FLUSHES, FENS AND SWAMPS

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

While not as diverse as lowland counterparts, the fens and flushes/springs of the uplands are small but important components of the upland landscape. The standing water attracts water plants and a number of invertebrates species, included some that are typical of upland environments. As with most upland habitats, the fens and flushes will occur as a mosaic with blanket bogs, wet and dry heath/grass areas, bog pools, exposed rock. Fens and flushes often occur as part of the Ffridd zone.

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

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

The following sites should be considered for selection:

- ***all undesignated, unmodified upland flushes, fens and swamps with 4 or more species from Table 8***

Table 8 – axiophyte species for upland flushes, fens and swamps in Powys

<i>Anagallis tenella</i>	Bog Pimpernel
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<i>Briza media</i>	Quaking-grass
<i>Caltha palustris</i> var. <i>radicans</i>	Marsh Marigold (upland form)
<i>Carex curta</i>	White Sedge
<i>Carex dioica</i>	Dioecious Sedge
<i>Carex flacca</i>	Glaucous Sedge
<i>Carex hostiana</i>	Tawny Sedge
<i>Carex lasiocarpa</i>	Slender Sedge
<i>Carex limosa</i>	Bog-sedge
<i>Carex magellanica</i>	Tall Bog-sedge
<i>Carex pulicaris</i>	Flea Sedge
<i>Drosera rotundifolia</i>	Round-leaved Sundew
<i>Eleocharis multicaulis</i>	Many-stalked Spike-rush
<i>Eleocharis quinqueflora</i>	Few-flowered Spike-rush
<i>Galium uliginosum</i>	Fen Bedstraw
<i>Hammarbya paludosa</i>	Bog Orchid
<i>Hypericum elodes</i>	Marsh St John's-wort
<i>Linum catharticum</i>	Fairy Flax
<i>Menyanthes trifoliata</i>	Bogbean
<i>Narthecium ossifragum</i>	Bog Asphodel
<i>Pedicularis sylvatica</i>	Lousewort
<i>Pilularia globulifera</i>	Pillwort
<i>Pinguicula vulgaris</i>	Common Butterwort
<i>Potentilla palustris</i>	Marsh Cinquefoil
<i>Ranunculus omiophyllus</i>	Round-leaved Crowfoot
<i>Rhynchospora alba</i>	White Beak-sedge
<i>Sagina nodosa</i>	Knotted Pearlwort
<i>Scutellaria minor</i>	Lesser Skullcap
<i>Selaginella selaginoides</i>	Lesser Clubmoss
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Triglochin palustre</i>	Marsh Arrowgrass
<i>Utricularia minor</i>	Lesser Bladderwort
<i>Vaccinium oxycoccos</i>	Cranberry
<i>Valeriana dioica</i>	Marsh Valerian

H7.2) LOWLAND FENS

Fens are predominantly fed by groundwater, rather than the rain-fed blanket and raised bogs. Fen vegetation is floristically varied and can resemble other habitats such as marshy grassland and wet heath. However, fen habitats are developed over peat deeper than 0.5 metres.

Fens occur throughout Wales, particularly at low altitudes and they fall into three main groups: 'basin fens'; 'valley fens' and 'flood-plain fens'. Basin fens occur in closed hollows, partly fed by ground water. Typically the vegetation consists of a floating mat of sedges and/or bryophytes. Valley fens are widely distributed in Wales, although in Powys the majority have been degraded through drainage – only fragments remain. Flood-plain fens are similar to valley fens, but are found on the stream flood-plains which are subject to flooding from the adjacent watercourse.

The following fen communities of high priority for nature conservation occur within Powys:

- M4 *Carex rostrata* - *Sphagnum recurvum* mire
- M5 *Carex rostrata* – *Sphagnum squarrosum* mire
- M6 *Carex echinata* - *Sphagnum recurvum/auriculatum* mire

Criteria for the selection of Local Wildlife Sites in Powys

- M9 *Carex rostrata* – *Calliergon cuspidatum* mire
- M10 *Carex dioica* - *Pinguicula vulgaris* mire
- M21 *Narthecium ossifragum* - *Sphagnum papillosum* valley mire
- M26 *Molinia caerulea* – *Crepis paludosa* mire
- M27 *Filipendula ulmaria* - *Angelica sylvestris* mire
- M28 *Iris pseudacorus* - *Filipendula ulmaria* mire
- M29 *Hypericum elodes* - *Potamogeton polygonifolius* soakway
- M30 Related vegetation of seasonally-inundated habitats
- M37 *Cratoneuron commutatum* - *Festuca rubra* spring
- S10 *Equisetum fluviatile* swamp
- S11 *Carex vesicaria* swamp
- S25 *Phragmites australis* – *Eupatorium cannabinum* tall-herb fen
- S27 *Carex rostrata* – *Potentilla palustris* tall-herb fen

The UK is thought to host a large proportion of the fen surviving in the EU. As in other parts of Europe fen vegetation has declined dramatically in the past century. Fen habitats support a diversity of plant and animal communities. Some can contain up to 550 species of higher plants, a third of our native plant species; up to and occasionally more than half the UK's species of dragonflies, several thousand other insect species, as well as being an important habitat for a range of aquatic beetles.

The following sites should be considered for selection:

- **all undesignated lowland fen habitat, providing they are not grossly modified by agricultural or other man-made improvement.**

H7.3) PURPLE MOORGRASS AND RUSH PASTURES

Marshy grassland is widely distributed in Powys. Two main types are found: those dominated by tall rushes (*Juncus*) and those where tussocky grasses, i.e. Purple Moor-grass (*Molinia caerulea*), are most prominent. These mainly fall within NVC communities M22 to M25, often in combination with elements of M15 wet heathland and are often referred to as 'rhos pastures'.

In sites where the rushes dominate, other dominant species include Yorkshire Fog (*Holcus lanatus*), Common Marsh Bedstraw (*Galium palustre*), Greater Bird's-foot-trefoil (*Lotus pedunculatus*) and Purple Moor-grass.

Where Purple Moor-grass is dominant, other co-dominant species found include Tormentil (*Potentilla erecta*), Devil's-bit Scabious (*Succisa pratensis*), Meadow Thistle (*Cirsium dissectum*) and Carnation Sedge (*Carex panicea*). Communities of this type may also be mapped and classified as being 'wet bog', 'wet heath' or 'fen meadow' depending on their species composition. Some of the more species-rich stands of this type are of very high nature conservation value.

Purple moor grass and rush pastures are a priority for nature conservation because they are highly susceptible to agricultural modification and reclamation, throughout their range and it is thought that considerably more survives in the UK than the rest of Europe.

The following sites should be considered for selection:

- **all undesignated M22 or M24 marshy grassland;**
- **all undesignated marshy grassland supporting 12 or more vascular plant species from Table 9 below.**

Table 9 – indicator species for purple moorgrass & rush pasture in Powys

<i>Achillea ptarmica</i>	Sneezewort
<i>Agrostis canina</i>	Velvet Bent
<i>Anagallis tenella</i>	Bog Pimpernel
<i>Angelica sylvestris</i>	Wild Angelica
<i>Briza media</i>	Quaking-grass
<i>Calamagrostis canescens</i>	Purple Small-reed
<i>Caltha palustris</i>	Marsh Marigold
<i>Cardamine pratensis</i>	Cuckoo Flower
<i>Carex disticha</i>	Brown Sedge
<i>Carex flacca</i>	Glaucous Sedge
<i>Carex hostiana</i>	Tawny Sedge
<i>Carex nigra</i>	Common Sedge
<i>Carex pallescens</i>	Pale Sedge
<i>Carex panacea</i>	Carnation Sedge
<i>Carex pulicaris</i>	Flea Sedge
<i>Carex rostrata</i>	Bottle Sedge
<i>Carex vesicaria</i>	Bladder-sedge
<i>Carex viridula subsp. brachyrrhyncha</i>	Long-stalked Yellow Sedge
<i>Carex viridula subsp. oedocarpa</i>	Common Yellow Sedge
<i>Carum verticillatum</i>	Whorled Caraway
<i>Cirsium dissectum</i>	Meadow Thistle
<i>Crepis paludosa</i>	Marsh Hawk's-beard
<i>Dactylorhiza</i> spp.	Marsh orchids
<i>Dactylorhiza</i> spp.	Spotted-orchids
<i>Danthonia decumbens</i>	Heath-grass
<i>Drosera rotundifolia</i>	Round-leaved Sundew
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern
<i>Eleocharis</i> spp.	Spike-rushes
<i>Epilobium palustre</i>	Marsh Willowherb
<i>Epilobium parviflorum</i>	Hoary Willowherb
<i>Epipactis palustris</i>	Marsh Helleborine
<i>Equisetum palustre</i>	Marsh Horsetail
<i>Equisetum sylvaticum</i>	Wood Horsetail
<i>Erica tetralix</i>	Cross-leaved Heath
<i>Eriophorum angustifolium</i>	Common Cottongrass
<i>Eriophorum latifolium</i>	Broad-leaved Cottongrass
<i>Eupatorium cannabinum</i>	Hemp-agrimony
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Galium palustre</i>	Common Marsh Bedstraw
<i>Galium uliginosum</i>	Fen Bedstraw
<i>Genista anglica</i>	Petty Whin
<i>Geum rivale</i>	Water Avens
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort
<i>Iris pseudacorus</i>	Yellow Iris
<i>Isolepis setacea</i>	Bristle Club-rush
<i>Juncus bulbosus</i>	Bulbous Rush
<i>Juncus conglomeratus</i>	Compact Rush
<i>Juncus inflexus</i>	Hard Rush

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<i>Juncus subnodulosus</i>	Blunt-flowered Rush
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil
<i>Luzula multiflora</i>	Heath Wood-rush
<i>Lychnis flos-cuculi</i>	Ragged-robin
<i>Lycopus europaeus</i>	Gypsywort
<i>Lysimachia nummularia</i>	Creeping-jenny
<i>Lysimachia vulgaris</i>	Yellow Loosestrife
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Mentha aquatica</i>	Water Mint
<i>Menyanthes trifoliata</i>	Bogbean
<i>Montia fontana</i>	Blinks
<i>Myosotis laxa</i>	Tufted Forget-me-not
<i>Myosotis scorpioides</i>	Water Forget-me-not
<i>Myosotis secunda</i>	Creeping Forget-me-not
<i>Myrica gale</i>	Bog Myrtle
<i>Narthecium ossifragum</i>	Bog Asphodel
<i>Oenanthe fistulosa</i>	Tubular Water-dropwort
<i>Pedicularis palustris</i>	Marsh Lousewort
<i>Pedicularis sylvatica</i>	Lousewort
<i>Persicaria bistorta</i>	Common Bistort
<i>Pinguicula vulgaris</i>	Common Butterwort
<i>Potentilla erecta</i>	Tormentil
<i>Potentilla palustris</i>	Marsh Cinquefoil
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Ranunculus flammula</i>	Lesser Spearwort
<i>Sagina nodosa</i>	Knotted Pearlwort
<i>Sanguisorba officinalis</i>	Great Burnet
<i>Salix repens</i>	Creeping Willow
<i>Scirpus sylvaticus</i>	Wood Club-rush
<i>Scutellaria galericulata</i>	Skullcap
<i>Scutellaria minor</i>	Lesser Skullcap
<i>Senecio aquaticus</i>	Marsh Ragwort
<i>Serratula tinctoria</i>	Saw-wort
<i>Stachys palustris</i>	Marsh Woundwort
<i>Stellaria alsine</i>	Bog Stitchwort
<i>Stellaria palustris</i>	Marsh Stitchwort
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Thalictrum flavum</i>	Common Meadow-rue
<i>Thelypteris palustris</i>	Marsh Fern
<i>Triglochin palustre</i>	Marsh Arrowgrass
<i>Trollius europaeus</i>	Globe-flower
<i>Vaccinium oxycoccos</i>	Cranberry
<i>Valeriana dioica</i>	Marsh Valerian
<i>Valeriana officinalis</i>	Common Valerian
<i>Veronica beccabunga</i>	Brooklime
<i>Veronica scutellata</i>	Marsh Speedwell
<i>Viola palustris</i>	Marsh Violet
<i>Wahlenbergia hederacea</i>	Ivy-leaved Bellflower

H7.4) REEDBED AND LOWLAND SWAMP

Reedbeds are wetlands dominated by stands of the Common Reed (*Phragmites australis*), wherein the water table is at or above ground level for most of the year. They tend to incorporate areas of open water and ditches and small areas of wet grassland and carr woodland may be associated with them. There are about 5,000ha of reedbeds in the UK, but

Criteria for the selection of Local Wildlife Sites in Powys

of the 900 or so sites contributing to this total, only about 50 are greater than 20ha. Reedbeds are amongst the most important habitats for birds in the UK; a number of rare invertebrates also rely on it.

Swamps are found around the edges of open water and tend to be species-poor, dominated by one or a few emergent species. Although the commonest NVC swamp community is S4 *Phragmites australis* swamp and reedbeds, the following can also be found in Powys:

- S3 *Carex paniculata* sedge-swamp
- S5 *Glyceria maxima* swamp
- S6 *Carex riparia* swamp
- S7 *Carex acutiformis* swamp
- S9 *Carex rostrata* swamp
- S12 *Typha latifolia* swamp
- S13 *Typha angustifolia* swamp
- S14 *Sparganium erectum* swamp
- S19 *Eleocharis palustris* swamp
- S22 *Glyceria fluitans* water-margin vegetation
- S23 Other water-margin vegetation

The following sites should be considered for selection:

- ***all undesignated S3, S4, S6, S7, S9, S12, S13, S14 or S19 reedbed and other tall swamp (of natural origin).***

H8) BOG

Section 7 of the Environment (Wales) Act 2016 identifies the following priority habitats under the broad category of 'Bogs':

- Lowland raised bog
- Blanket bog

Definitions of these habitat types is available on the [JNCC website](#).

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

H8.1) LOWLAND RAISED BOG

Raised bogs in this category are restricted to level ground in the lowlands, along valley floors and estuarine floodplains. They are widely distributed, but very scarce in Wales and as such, the majority of sites are already designated as SSSIs or National Nature Reserves (NNRs).

Lowland raised bog is made up of a shallow dome of peat, which has developed through succession from open water to swamp and fen. Very few examples of lowland raised bog occur in Powys. The main NVC community types found are:

- M2 *Sphagnum cuspidatum/recurvum* bog pool community
- M4 *Carex rostrata - Sphagnum recurvum* mire
- M5 *Carex rostrata – Sphagnum squarrosum* mire
- M18 *Erica tetralix – Sphagnum papillosum* raised and blanket mire
- M19 *Calluna vulgaris-Eriophorum vaginatum* blanket mire
- M20 *Eriophorum vaginatum* blanket and raised mire
- M25 *Molinia caerulea-Potentilla erecta* mire
- M29 *Hypericum elodes - Potamogeton polygonifolius* soakway

All bog habitats are selected using the same criteria which can be found at the end of this section, below Blanket Bog (H8.2).

H8.2) BLANKET BOG

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

Blanket bog vegetation may contain substantial amounts of dwarf shrubs, but is distinguished from heathland by its occurrence on deep peat (>0.5 m) and usually contains frequent occurrence of Hare's-tail Cottongrass (*Eriophorum vaginatum*) and characteristic mosses. Many of the typical blanket mire species, such as Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Deergrass (*Trichophorum germanicum*), cottongrass (*Eriophorum*) species and several of the bog moss (*Sphagnum*) species, occur throughout much of the range of the habitat, although their relative proportions vary across the country.

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

- M1 *Sphagnum auriculatum* bog pool community
- M2 *Sphagnum cuspidatum/recurvum* bog pool community
- M3 *Eriophorum angustifolium* bog pool community
- M4 *Carex rostrata* - *Sphagnum recurvum* mire
- M17 *Scirpus cespitosus*-*Eriophorum vaginatum* blanket mire
- M18 *Erica tetralix* – *Sphagnum papillosum* raised and blanket mire
- M19 *Calluna vulgaris*-*Eriophorum vaginatum* blanket mire
- M20 *Eriophorum vaginatum* blanket and raised mire

The following sites should be considered for selection:

- **all undesignated, undegraded bog habitats;**
- **all undesignated degraded bog habitats supporting one or more vascular plant species of restricted distribution in Powys (marked **bold in Table 10 below*);**
- **all undesignated degraded bog habitats supporting 5 or more species from Table 10.**

Table 10 – species characteristic of bog habitats in Powys

*Andromeda polifolia	*Bog Rosemary
<i>Calluna vulgaris</i>	Heather
<i>Carex curta</i>	White Sedge
*Carex diandra	*Lesser Tussock-sedge
<i>Carex echinata</i>	Star Sedge
*Carex lasiocarpa	*Slender Sedge
<i>Carex limosa</i>	Bog Sedge
*Carex magellanica	*Tall Bog-sedge
<i>Carex rostrata</i>	Bottle Sedge
<i>Dactylorhiza maculata</i>	Heath Spotted-orchid
*Drosera intermedia	*Oblong-leaved Sundew
<i>Drosera rotundifolia</i>	Round-leaved Sundew
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern
<i>Eleocharis multicaulis</i>	Many-stalked Spike-rush
<i>Empetrum nigrum</i>	Crowberry
<i>Equisetum fluviatile</i>	Water Horsetail
<i>Eriophorum angustifolium</i>	Common Cottongrass
*Eriophorum latifolium	*Broad-leaved Cottongrass
<i>Eriophorum vaginatum</i>	Hare's-tail Cottongrass
*Hammarbya paludosa	*Bog Orchid
<i>Juncus bulbosus</i>	Bulbous Rush
<i>Menyanthes trifoliata</i>	Bogbean
*Myrica gale	*Bog Myrtle
<i>Narthecium ossifragum</i>	Bog Asphodel
*Osmunda regalis	*Royal Fern
<i>Pinguicula vulgaris</i>	Common Butterwort
<i>Potamogeton polygonifolius</i>	Bog Pondweed
<i>Potentilla palustris</i>	Marsh Cinquefoil
*Rhynchospora alba	*White Beak-sedge

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*<i>Rubus chamaemorus</i>	*Cloudberry
*<i>Sphagnum magellanicum</i>	*Magellanic Bog-moss
<i>Sphagnum</i> spp.	Other bog-mosses
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Trichophorum germanicum</i>	Deergrass
<i>Utricularia minor</i>	Lesser Bladderwort
<i>Vaccinium myrtillus</i>	Bilberry
<i>Vaccinium oxycoccos</i>	Cranberry
<i>Vaccinium vitis-idaea</i>	Cowberry
<i>Viola palustris</i>	Marsh Violet

* VASCULAR PLANT SPECIES OF BOG HABITATS WITH A RESTRICTED DISTRIBUTION IN POWYS

H9) RIVERS AND STREAMS

Section 7 of the Environment (Wales) Act 2016 identifies the 'Rivers' priority habitat type, under the broad category of 'Rivers and Streams'. The definition of this habitat type is available on the [JNCC website](#).

H9.1) RIVERS

This habitat includes a very wide range of types, encompassing all natural and near-natural running waters in the UK (i.e. with features and processes that resemble those in 'natural' systems). These range from torrential mountain streams to meandering lowland rivers. Numerous factors influence the ecological characteristics of a watercourse; for example, geology, topography, substrate, gradient, flow rate, altitude, channel profile, climate, catchment features (soil, land use, vegetation, etc.) - human activities add to this complexity. In addition most river systems change greatly in character as they flow from source to sea or lake.

Rivers are difficult to conserve, but are important wildlife corridors, migratory routes and key breeding areas for birds, such as Common Sandpiper, Grey Wagtail, White-throated Dipper, Goosander, Little Ringed Plover, Common Kingfisher and Sand Martin. The rivers of Powys are also important for a number of fish species, such as Atlantic Salmon, trout, lamprey and shad species, as well as Freshwater White-clawed Crayfish, and European Water Vole, both of which are now very scarce.

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.

Natural, dynamic flowing watercourses contain distinctive features, such as riffles and pools, meanders, eroding soft cliffs and exposed riverine sediments (gravel bars, etc.). 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. These communities could be selected through individual species criteria or assemblages, but 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 selected as Local 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 watercourses should also be included, even if the associated habitats do not merit selection as a Local Wildlife Site in their own right. This may include flood meadows, woodland, marsh and pollarded willows, for example. Reens (ditches) should also be considered, as it is a habitat that is often rich in rare or uncommon flora and fauna. Watercourses can form an important hydrological link to other habitats, such as alder/willow carr or wet grassland and may be included as part of those habitats or as part of a mosaic.

The following sites should be considered for selection:

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- **all undesignated rivers or streams supporting one or more of the species listed in Table 11, provided the species has been recorded there within at least 10 years of the assessment date and is found within the river channel or adjacent regularly flooded areas;**
- **all undesignated rivers or streams with a predominantly natural bank and bed profile, free of canalisation and revetment and no persistent gross pollution, supporting an average of 5 or more species of submerged, floating and emergent plant species in 50m;**
- **all undesignated rivers or streams with exposed river sediments known to support diverse or rare invertebrate fauna.**

Table 11 – restricted species found in the rivers and streams of Powys

Vascular plants	
<i>Allium schoenoprasum</i>	Chives
<i>Butomus umbellatus</i>	Flowering Rush
<i>Callitriche obtusangula</i>	Blunt-fruited Water-starwort
<i>Callitriche platycarpa</i>	Various-leaved Water-starwort
<i>Carex elata</i>	Tufted-sedge
<i>Limosella aquatica</i>	Mudwort
<i>Luronium natans</i>	Floating Water-plantain
<i>Lysimachia vulgaris</i>	Yellow Loosestrife
<i>Myosoton aquaticum</i>	Water Chickweed
<i>Myriophyllum verticillatum</i>	Whorled Water-milfoil
<i>Nuphar lutea</i>	Yellow Water-lily
<i>Oenanthe aquatica</i>	Fine-leaved Water-dropwort
<i>Potamogeton crispus</i>	Curled Pondweed
<i>Potamogeton perfoliatus</i>	Perfoliate Pondweed
<i>Ranunculus fluitans</i>	River Water-crowfoot
<i>Ranunculus penicillatus</i> subsp. <i>penicillatus</i>	Stream Water-crowfoot
<i>Ranunculus trichophyllus</i>	Thread-leaved Water-crowfoot
<i>Scrophularia auriculata</i>	Water Figwort
<i>Thalictrum flavum</i>	Common Meadow-rue
<i>Veronica catenata</i>	Pink Water-speedwell
Lichen	
<i>Collema dichotomum</i>	River Jelly Lichen
Invertebrates	
<i>Austropotamobius pallipes</i>	Freshwater White-clawed Crayfish
<i>Coccinella quinquepunctata</i>	5-spot Ladybird
<i>Gomphus vulgatissimus</i>	Common Club-tail
<i>Platycnemis pennipes</i>	White-legged Damselfly
Fish	
<i>Alosa alosa</i>	Allis Shad
<i>Alosa fallax</i>	Twaite Shad
<i>Anguilla anguilla</i>	European Eel
<i>Lampetra fluviatilis</i>	River Lamprey
<i>Lampetra planeri</i>	Brook Lamprey
<i>Petromyzon marinus</i>	Sea Lamprey
<i>Salmo salar</i>	Atlantic Salmon
Mammals	
<i>Arvicola amphibious</i>	European Water Vole

H10) STANDING OPEN WATERS AND CANALS

Section 7 of the Environment (Wales) Act 2016 identifies the following priority habitats under the broad category of 'Standing open waters and canals':

- Oligotrophic and dystrophic lakes
- Ponds
- Mesotrophic lakes
- Eutrophic standing waters
- Aquifer-fed naturally fluctuating water bodies (not found in Powys)

Definitions of these habitat types is available on the [JNCC website](#).

Powys has a wide range of standing water types. The peat-dominated upland landscapes where the catchments drain calcium-poor rocks are predominantly acidic and poor in nutrients. Generally the water is peat coloured, has very little turbidity and the diversity of aquatic plants is low. In contrast, standing waters in the south of Brecknock are rich in nutrients and highly productive; they often possess a diverse range of aquatic vascular plants.

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.

H10.1) OLIGOTROPHIC AND DYSTROPHIC LAKES

Oligotrophic and dystrophic lakes are water bodies mainly more than 2ha in size which are characterised by their low nutrient levels and low productivity. Their catchments usually occur on hard, acid rocks, most often in the uplands. This habitat type encompasses a wide range of size and depth and includes the largest and deepest water bodies in the UK. Good examples may support some of the least disturbed aquatic assemblages in the UK.

Characterised by clear, well oxygenated water, oligotrophic lakes typically have low alkalinity with significant areas of hard substrate, such as gravel and cobbles. This is a widespread habitat type in Wales, most common in the upland areas of Snowdonia and the Cambrian Mountains, but relatively scarce elsewhere.

Dystrophic lakes have water that is stained brown due to the presence of high concentrations of dissolved organic carbon from peat. They occur exclusively on or close to deep peat, usually blanket bog and are often fishless and may also lack submerged plants. This is a scarce habitat type in Wales.

The following sites should be considered for selection:

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

H10.2) PONDS

Ponds, for the purpose of the UK BAP priority habitat classification, are defined as permanent and seasonal standing water bodies up to 2ha in extent, which meet one or more of a specific set of criteria. Full details of these can be found on the [JNCC website](#). Of those likely to exist in Powys, these criteria can be summarised as follows:

- Ponds supporting species of high conservation importance
- Ponds supporting exceptional populations or numbers of key species
- Ponds of high ecological quality (i.e. having a PSYM score $\geq 75\%$ - see Howard, 2002)
- Individual ponds or groups of ponds with a limited geographic distribution, recognised as important because of their age, rarity of type or landscape context

Ponds in Radnorshire and Brecknock are considered nationally important for their wetland plant and macroinvertebrate species and assemblages. Upland ponds and pools are abundant within this area, where they are often collectively referred to as 'mawn pools', particularly in Radnorshire. The area also has many records for Great Crested Newt and Pillwort. For this reason, the area was identified as an Important Area for Ponds (IAP) as part of a preliminary assessment of Wales (Nicolet et al., 2007). The Important Areas for Ponds (IAP) concept was proposed and developed by Freshwater Habitats Trust to raise awareness of geographic regions that support ponds of national or international biodiversity importance. The project was successfully piloted in Wales prior to ponds being added to the UK list of BAP Priority Habitats in 2007. The aim of IAPs is to identify networks of the most important ponds and their biodiversity. These areas can then be used to help focus strategies for pond monitoring, protection and appropriate management and creation.

Ponds may often qualify for selection as Local Wildlife Sites using the species criteria, particularly when Great Crested Newt (S3) are present or due to exceptional invertebrate assemblages (S5). The National Pond Survey (Pond Action, 1998) and PSYM pond surveys are the recognised methodologies for professional assessment of ponds. These should be considered the preferred method for assessing pond quality, however, in both cases, they require considerable expertise and time to carry out the survey and results need to be sent to Freshwater Habitats Trust for analysis.

First developed by Pond Conservation in 2009, 'The Big Pond Dip invertebrate survey' (Pond Conservation, 2010) is a simple biological quality assessment method. It was designed for use by the wider public and assesses the overall 'naturalness' of ponds, but was also shown to be a good indicator of species richness. It was developed from the methods used by the National Pond Survey and PSYM and although specifically developed for garden ponds, the methods can be applied to any pond or lake up to 5 hectares in area. A high score on the Big Pond Dip indicates that a pond supports animals typical of high quality waterbodies. This method would therefore seem appropriate for a rapid assessment of pond quality and sites scoring highly should be considered for Local Wildlife Site selection or used to target more detailed expert survey.

Networks of small ponds may not qualify individually, but could be deemed as higher value than isolated larger ponds, as they create important connectivity for pond species. When considering site boundaries for Local Wildlife Site ponds, sufficient terrestrial habitat should be included, relevant to the interest of the site and to reduce the chance of water pollution from adjacent land use.

The following sites should be considered for selection:

- ***all undesignated 'High Quality Ponds' identified by and within the Radnorshire and Brecknock IAP;***
- ***all undesignated ponds which score 'High' or 'Very High' when assessed using methodology set out in the National Pond Survey (Pond Action, 1998);***
- ***all undesignated ponds which have a PSYM score $\geq 75\%$ (Howard, 2002);***
- ***all undesignated ponds scoring ≥ 52 using the Big Pond Dip survey methodology (ponds scoring at least 35 should be further surveyed using National Pond Survey/PSYM).***

More information on the National Pond Survey, PSYM and Big Pond Dip can be found on Freshwater Habitats Trust website: <https://freshwaterhabitats.org.uk>

H10.3) MESOTROPHIC LAKES

Mesotrophic lakes are an increasingly rare habitat type in the UK; they have a narrow range of nutrients, easily altered artificially. Their clear, well-oxygenated waters are more productive and usually warmer than oligotrophic lakes and they occur at lower altitudes and more sheltered locations. They often contain a mixture of hard and soft substrates, providing a range of niches; marginal swamp, fen and wet woodland tend to occur along their margins. Consequently, mesotrophic lakes can support a very wide range of biodiversity, typically the highest plant diversity of all the lake types and relative to other lake types, they contain a higher proportion of nationally scarce and rare aquatic plants.

This habitat type has a scattered distribution throughout Wales, without any particular concentrations. In Powys, mesotrophic lakes are a particular feature of the mid-eastern section, from south-eastern Montgomeryshire, through mid and eastern Radnorshire, to north-east Brecknockshire.

The following sites should be considered for selection:

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

H10.4) EUTROPHIC STANDING WATERS

Eutrophic standing waters are highly productive because plant nutrients are plentiful, either naturally or as a result of artificial enrichment. These water bodies are characterised by having dense, long-term populations of algae in mid-summer, often making the water green. Their beds are covered by dark anaerobic mud, rich in organic matter. The definition of this habitat includes both natural and man-made still waters such as lakes, reservoirs, oxbow lakes and gravel pits, but excludes small pools, field ponds and brackish waters. Some lakes will have been enriched as a result of human activity and so have been forced along the trophic continuum from a mesotrophic to a eutrophic state.

Healthy eutrophic lakes have high biodiversity, with abundant aquatic, emergent and bankside plants, supporting a great diversity of invertebrates, such as snails, dragonflies and

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water beetles. This abundance of food can also support internationally important bird populations.

Eutrophic waters are most typical of hard water areas of the lowlands of southern and eastern Britain, but they are also fairly widespread in Wales, with clusters in Anglesey and Powys. The Tywi and Severn Valleys contain a number of important oxbow lakes.

The following sites should be considered for selection:

- ***all undesignated eutrophic lakes and ponds which have largely unmodified, semi-natural beds and banks, good water quality and which support good aquatic, emergent or bankside plant communities.***

H11) INLAND ROCK

Section 7 of the Environment (Wales) Act 2016 identifies the following priority habitats under the broad category of 'Inland rock':

- Inland rock outcrop and scree habitats
- Calaminarian grasslands
- Open mosaic habitats on previously developed land
- Limestone pavement

Definitions of these habitat types is available on the [JNCC website](#).

H11.1) INLAND ROCK OUTCROP AND SCREE HABITATS

Rock exposures are a particular feature of the uplands, but also occur locally in lowland situations. The type of bed-rock has a crucial influence upon the type of vegetation encountered at a site and many are host to a number of different plant communities. Non-vascular plants may be dominant in some sites, as may certain fern species. Many nationally rare and scarce species can occur, including notable bryophytes and lichens.

Rock and scree communities are intrinsically rare as a habitat type. The following rock and scree NVC communities are found in Powys:

- **U16** *Luzula sylvatica-Vaccinium myrtillus* tall herb community (Section 7);
- **U17** *Luzula sylvatica-Geum rivale* tall herb community (Section 7);
- **U21** *Cryptogramma crispa-Deschampsia flexuosa* community (Section 7);
- **OV38** *Arrhenatherum elatius-Gymnocarpium robertianum* community (Section 7);
- **OV39** *Asplenium trichomanes-A. ruta-muraria* community (Section 7);
- **OV40** *Asplenium viride-Cystopteris fragilis* community (Section 7)

U16 & U17 are characteristic of old red sandstone crags and cliff ledges. These communities are likely to occur on relatively ungrazed, upland hillsides.

OV38 is one of the characteristic communities of limestone crags, scree and outcrops. It favours calcareous substrates and is generally composed of fern and grass-dominated open vegetation, on areas of limestone crags and scree, but also pavement.

OV39 & OV40 occur in rock gully and crevice habitats. Both of these communities are composed of open vegetation, often fragmented. Ferns and bryophytes are characteristically dominant.

These vegetation types are rather poorly characterised in the NVC and do not reflect the full spectrum of floristic variation within rock crevices. Bryophyte / lichen dominated communities of rock surfaces are not covered by the NVC.

In many cases rock & scree habitats are likely to fall within mosaics of other surrounding habitats which also qualify for selection. The presence of species of interest may allow selection under the Species criteria, particularly with reference to Bryophytes (S7) and Lichens (S8) of conservation concern and bats (S1.2).

The following sites should be considered for selection:

- **all undesignated areas / exposures of Section 7 rock & scree habitat (identified above);**
- **all undesignated areas of rock & scree habitat ≥ 0.5 ha;**
- **all undesignated areas of rock & scree habitat supporting 5 or more species from Table 12 below.**

Table 12 – vascular plants found in rock & scree habitats in Powys

<i>Allium vineale</i>	Wild Onion
<i>Antennaria dioica</i>	Mountain Everlasting
<i>Arenaria serpyllifolia</i>	Thyme-leaved Sandwort
<i>Asplenium septentrionale</i>	Forked Spleenwort
<i>Asplenium viride</i>	Green Spleenwort
<i>Cardamine impatiens</i>	Narrow-leaved Bitter-cress
<i>Catapodium rigidum</i>	Fern-grass
<i>Cerastium diffusum</i>	Sea Mouse-ear
<i>Ceratocarpus claviculata</i>	Climbing Corydalis
<i>Ceterach officinarum</i>	Rustyback (natural situations only)
<i>Circaea alpina</i>	Alpine Enchanter's-nightshade
<i>Clinopodium ascendens</i>	Common Calamint
<i>Convallaria majalis</i>	Lily of The Valley
<i>Cryptogramma crispa</i>	Parsley Fern
<i>Cystopteris fragilis</i>	Brittle Bladder-fern
<i>Diphasiastrum alpinum</i>	Alpine Clubmoss
<i>Dryopteris aemula</i>	Hay-scented Buckler-fern
<i>Dryopteris expansa</i>	Northern Buckler-fern
<i>Dryopteris oreades</i>	Mountain Male Fern
<i>Galium boreale</i>	Northern Bedstraw
<i>Genista pilosa</i>	Hairy Greenweed
<i>Geranium lucidum</i>	Shining Crane's-bill
<i>Geranium sanguineum</i>	Bloody Crane's-bill
<i>Geranium sylvaticum</i>	Wood Crane's-bill
<i>Geum rivale</i>	Water Avens
<i>Gymnocarpium dryopteris</i>	Oak Fern
<i>Gymnocarpium robertianum</i>	Limestone Fern
<i>Helianthemum nummularium</i>	Common Rock-rose
<i>Huperzia selago</i>	Fir Clubmoss
<i>Luzula sylvatica</i>	Great Wood-rush
<i>Lycopodium clavatum</i>	Stag's-horn Clubmoss
<i>Meconopsis cambric</i>	Welsh Poppy
<i>Melica nutans</i>	Mountain Melick
<i>Minuartia verna</i>	Spring Sandwort
<i>Orthilia secunda</i>	Serrated Wintergreen
<i>Phegopteris connectilis</i>	Beech Fern
<i>Polygonatum odoratum</i>	Angular Solomon's-seal
<i>Polypodium cambricum</i>	Southern Polypody
<i>Polypodium interjectum</i>	Intermediate Polypody
<i>Rubus saxatilis</i>	Stone Bramble
<i>Saxifraga hypnoides</i>	Mossy Saxifrage
<i>Saxifraga oppositifolia</i>	Purple Saxifrage
<i>Saxifraga stellaris</i>	Starry Saxifrage
<i>Sedum forsterianum</i>	Rock Stonecrop
<i>Sedum rosea</i>	Roseroot
<i>Sedum telephium</i>	Orpine

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<i>Sorbus porrigentiformis</i>	Grey-leaved Whitebeam
<i>Sorbus rupicola</i>	Rock Whitebeam
<i>Sorbus torminalis</i>	Wild Service-tree
<i>Taxus baccata</i>	Yew
<i>Teucrium scorodonia</i>	Wood Sage
<i>Thalictrum minus</i>	Lesser Meadow-rue
<i>Tilia platyphyllos</i>	Large-leaved Lime
<i>Trollius europaeus</i>	Globe-flower

H11.2) CALAMINARIAN GRASSLANDS

Calaminarian grasslands include a range of semi-natural and anthropogenic sparsely vegetated habitats on substrates, characterised by high levels of heavy metals such as lead, chromium and copper, or other unusual minerals. These are open-structured plant communities, often composed of specialist ruderal/metallophyte species of lichens, bryophytes and vascular plants. Outside the UK it is very rare.

These metal-rich habitats are found scattered across Powys in natural rock outcrops, screes and river gravels, as well as mine workings and even as a result of run-off from building materials or stonework such as copper window grills, lightning conductors, galvanised wire fencing, electricity pylons and corrugated iron sheeting. Artificial mineral workings & spoil are the most common source and mine spoil has also been used to surface paths, forest tracks, railway lines and even graves as its toxicity keeps weeds at bay. The Fan lead mines near Llanidloes in Montgomeryshire provided material for the Cambrian Railway and the Central Wales Railway. More than 40 years after the latter's closure, the metal-rich ballast is still remarkably weed-free, providing excellent habitat for metallophytes on Radnorshire Wildlife Trust's Gilfach Nature Reserve, near Rhayader.

Calaminarian grassland types are not fully covered by the NVC. The OV37 *Festuca ovina-Minuartia verna* community, with its three sub-communities, is the only one described and is not thought to be present in Powys. However, there are metallophyte habitats in the area, which can be distinguished from other grassland types by the open sward and presence of metallophyte species.

The following sites should be considered for selection:

- ***all undesignated calaminarian grassland sites supporting a good assemblage of indicator species****

* requires assessment by a lower plants specialist.

H11.3) OPEN MOSAIC HABITATS ON PREVIOUSLY DEVELOPED LAND

A diverse range of post-industrial sites are found throughout Powys, with areas of colliery spoil, slag and old quarries 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 and embankments.

The varied, often mixed soil types and the frequent occurrence of varied topography and extremes of drainage all promote high floral and faunal diversity, as well as unusual assemblages of plant species, on post-industrial 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 Green Tiger Beetle (*Cicindela campestris*). Extensive areas of largely bare ground can be important for breeding birds such as Northern Lapwing (*Vanellus vanellus*) and Little Ringed Plover (*Charadrius dubius*), whilst sites with varied vegetation structure and 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 Local 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 Local Wildlife Site quality are all frequent on post-industrial land. Sites with a high diversity of native and archaeophyte species could be selected as Local 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 criteria. Furthermore, many post-industrial land sites have a range of habitats present, such that the site is suitable for selection as a Local Wildlife Site on the basis of its mosaic of habitats (H12), even if none of the habitat elements are of Local Wildlife Site quality in their own right.

The following sites should be considered for selection:

- ***all undesignated areas of previously developed land $\geq 0.25ha$, which has re-vegetated, supporting a mosaic of bare ground and 20 or more non-woody species from Tables 4, 5, 6, 7 & 12.***

H11.3) LIMESTONE PAVEMENT

Limestone pavements are of both geological and biological importance and the UK holds a significant proportion of the limestone pavement resource within Europe. In Wales, these were formed on Carboniferous limestone, laid down 350 million years ago and eroded during the last Ice Age, to form the level and gently sloping platforms seen today. Limestone pavements are divided into blocks (called 'clints') and are bounded by vertical fissures known as 'grikes').

Limestone pavements have a distinctive flora - woodland and wood-edge species are well-represented in the sheltered grikes, whilst the clints support plants of rocky habitats or are often unvegetated. On the limestone pavements of Brecknock where grazing has ceased, the woodland flora dominates and dense stands of Hazel (*Corylus avellana*) develop. Where grazing continues, communities with a closer affinity to grassland remain. Over 80 herb species have been recorded on the limestone pavements of Brecknock (Burek and Deacon, 1997).

Areas of pavement may be associated with exposed limestone faces which are not considered to be pavement, or scree and boulder fields of eroded material. The area immediately around limestone pavement is often calcareous grassland and small outcrops of pavement may form a mosaic, with different calcareous communities of both grassland and scrub. Local Wildlife sites should seek to include these other areas of Section 7 habitat within the site boundaries.

The following sites should be considered for selection:

- ***all undesignated limestone pavement.***

H12) MOSAIC HABITATS

Mosaic sites, comprising of complex mixtures of semi-natural habitats, are acknowledged to be problematic when determining criteria for Local 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.

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

It is unrealistic to design a firm criterion for the selection of mosaic 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.

Nevertheless, the following mosaic sites should be considered for selection:

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

H12.1) SCRUB & FFRIDD

Scrub communities do not feature as a specified Section 7 priority habitat, but 'scrub & ffridd' (also known as 'Coedcae') is a Local Biodiversity Action Plan habitat – currently under review and known as Powys Nature Recovery Action Plan (Powys NRAP). The draft Scrub & Ffridd Habitat Action Plan (HAP) describes this habitat as a mosaic of semi-natural communities usually located between improved agricultural land in valley bottoms and the plateaus of the hilltops. The mosaic can be a mixture of woody vegetation such as birch, ash, gorse, broom, rowan, oak, rose and willow growing in and around areas of scattered bracken, bramble, heath and semi-natural grasslands.

This varied structure, with dense patches of closed vegetation and more open grassland swards, provides for many niches which can support notable lower plant communities and

Criteria for the selection of Local Wildlife Sites in Powys

priority butterfly, reptile and bird species, including Pearl-bordered Fritillary (*Boloria euphrosyne*), Adder (*Vipera berus*), Common Lizard (*Zootoca vivipara*), European Nightjar (*Caprimulgus europaeus*), Common Cuckoo (*Cuculus canorus*) and Merlin (*Falco columbarius*). The varied habitat structure allows wildlife to adapt to disturbances such as changes to extent, edge effects and age of habitat patches. It is possible therefore, to manage scrub and ffridd to maintain and enhance the conditions for these noted associated species, as long as there are linkages for them to disperse into adjacent habitat patches.

The boundaries of Ffridd are very difficult to define and it will often grade gently into more clearly defined upland mosaics above and lowland pastures and woodland below. Given this difficulty, the habitat value and its importance for connectivity, Scrub & Ffridd Local Wildlife Sites should seek to include adjacent habitat where a clear boundary such as a fence line can be used to set a definite boundary.

It is important to note that, aside from this priority habitat type, mixed scrub habitats, with good structural diversity, for example, varied age ranges & canopy heights, the presence of small rides & clearings, good gradations in edge habitats, varied ground flora etc., can support high biodiversity, as well as priority species, such as the Hazel Dormouse (*Muscardinus avellanarius*). Scrub habitats are extremely variable in form and composition and even some of the common communities may be exceptionally rich in species. In addition, scrub communities may also form important connections, linking habitats between other features of interest, forming a peripheral part of another habitat of interest, or under the Species Guidelines, where they support species of significance.

The following sites should be considered for selection:

- ***all undesignated scrub or ffridd sites, comprising a mosaic of at least 3 habitat communities and one or more of the following criteria:***
 - ***30 or more typical plant species (listed in Table 13) present***
 - ***8 or more butterfly/bird species from Table 14 present***

Note that some of the species listed in Table 14, for example, the Pearl-bordered Fritillary (*Boloria euphrosyne*), would qualify as a Species Local Wildlife Site in their own right. Refer to Species criteria section for more information.

Table 13 – typical plants of scrub and ffridd in Powys

<i>Acer campestre</i>	Field Maple
<i>Achillea millefolium</i>	Yarrow
<i>Adoxa moschatellina</i>	Moschatel
<i>Agrimonia eupatoria</i>	Agrimony
<i>Agrimonia procera</i>	Fragrant Agrimony
<i>Aira</i> spp.	hair-grasses
<i>Alchemilla</i> spp.	Lady's mantles
<i>Alliaria petiolata</i>	Garlic Mustard
<i>Anacamptis pyramidalis</i>	Pyramidal Orchid
<i>Anemone nemorosa</i>	Wood Anemone
<i>Anthriscus sylvestris</i>	Cow Parsley
<i>Anthyllis vulneraria</i>	Kidney Vetch
<i>Aphanes</i> agg.	Parsley-pierts
<i>Arum maculatum</i>	Lords-and-ladies

Criteria for the selection of Local Wildlife Sites in Powys

<i>Betula</i> spp.	Birches
<i>Blackstonia perfoliata</i>	Yellow-wort
<i>Brachypodium pinnatum</i>	Heath False-brome
<i>Brachypodium sylvaticum</i>	False Brome
<i>Briza media</i>	Quaking Grass
<i>Bryonia dioica</i>	White Bryony
<i>Botrychium lunaria</i>	Moonwort
<i>Bromopsis erecta</i>	Upright Brome
<i>Calluna vulgaris</i>	Heather
<i>Campanula rotundifolia</i>	Harebell
<i>Carduus nutans</i>	Musk Thistle
<i>Carex binervis</i>	Green-ribbed Sedge
<i>Carex caryophyllea</i>	Spring-sedge
<i>Carex flacca</i>	Glaucous Sedge
<i>Carex muricata</i>	Prickly Sedge
<i>Carex pallescens</i>	Pale Sedge
<i>Carex pilulifera</i>	Pill Sedge
<i>Carex spicata</i>	Spiked Sedge
<i>Centaurea nigra</i>	Common Knapweed
<i>Centaurea scabiosa</i>	Greater Knapweed
<i>Centaurium erythraea</i>	Common Centaury
<i>Ceratocarpus claviculata</i>	Climbing Corydalis
<i>Circaea lutetiana</i>	Enchanter's Nightshade
<i>Cirsium acaule</i>	Dwarf Thistle
<i>Cirsium eriophorum</i>	Woolly Thistle
<i>Clematis vitalba</i>	Traveller's Joy
<i>Clinopodium ascendens</i>	Common Calamint
<i>Clinopodium vulgare</i>	Wild Basil
<i>Conopodium majus</i>	Pignut
<i>Cornus sanguinea</i>	Dogwood
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Cruciata laevipes</i>	Crosswort
<i>Cynoglossum officinale</i>	Hound's-tongue
<i>Dactylorhiza</i> spp.	Spotted-orchids
<i>Danthonia decumbens</i>	Heath-grass
<i>Deschampsia flexuosa</i>	Wavy Hair-grass
<i>Digitalis purpurea</i>	Foxglove
<i>Dioscorea communis</i>	Black Bryony
<i>Dryopteris affinis</i>	Scaly Male Fern
<i>Dryopteris filix-mas</i>	Male Fern
<i>Epipactis helleborine</i>	Broad-leaved Helleborine
<i>Erica cinerea</i>	Bell Heather
<i>Erica tetralix</i>	Cross-leaved Heath
<i>Eriophorum angustifolium</i>	Common Cottongrass
<i>Erodium cicutarium</i>	Common Stork's-bill
<i>Euonymus europaeus</i>	Spindle
<i>Euphrasia officinalis</i> agg.	Eyebrights
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Fragaria vesca</i>	Wild Strawberry
<i>Galium mollugo</i>	Hedge Bedstraw
<i>Galium saxatile</i>	Heath Bedstraw
<i>Galium verum</i>	Lady's Bedstraw
<i>Geranium molle</i>	Dove's-foot Crane's-bill
<i>Geranium pratense</i>	Meadow Crane's-bill
<i>Geranium robertianum</i>	Herb Robert
<i>Geum rivale</i>	Water Avens
<i>Geum urbanum</i>	Wood Avens

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<i>Glechoma hederacea</i>	Ground Ivy
<i>Helianthemum nummularium</i>	Common Rock-rose
<i>Helictotrichon pubescens</i>	Downy Oat-grass
<i>Holcus mollis</i>	Creeping Soft-grass
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hypericum hirsutum</i>	Hairy St John's-wort
<i>Hypericum humifusum</i>	Trailing St John's-wort
<i>Hypericum maculatum</i>	Imperforate St John's-wort
<i>Hypericum montanum</i>	Pale St John's-wort
<i>Hypericum perforatum</i>	Perforate St John's-wort
<i>Hypericum pulchrum</i>	Slender St John's-wort
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Ilex aquifolium</i>	Holly
<i>Inula conyzae</i>	Ploughman's Spikenard
<i>Jasione montana</i>	Sheep's Bit
<i>Knautia arvensis</i>	Field Scabious
<i>Koeleria macrantha</i>	Crested Hair-grass
<i>Lathyrus linifolius</i>	Bitter Vetch
<i>Lathyrus pratensis</i>	Meadow Vetchling
<i>Lathyrus sylvestris</i>	Narrow-leaved Everlasting-pea
<i>Leontodon autumnalis</i>	Autumn Hawkbit
<i>Leontodon saxatilis</i>	Lesser Hawkbit
<i>Linaria vulgaris</i>	Common Toadflax
<i>Linum catharticum</i>	Fairy Flax
<i>Listera ovata</i>	Common Twayblade
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Luzula campestris</i>	Field Wood-rush
<i>Luzula multiflora</i>	Heath Wood-rush
<i>Malus sylvestris</i>	Crab Apple
<i>Malva moschata</i>	Musk-mallow
<i>Medicago lupulina</i>	Black Meddick
<i>Mercurialis perennis</i>	Dog's Mercury
<i>Moenchia erecta</i>	Upright Chickweed
<i>Moehringia trinervia</i>	Three-nerved Sandwort
<i>Myosotis ramosissima</i>	Early Forget-me-not
<i>Ophioglossum vulgatum</i>	Adder's-tongue
<i>Orchis mascula</i>	Early-purple Orchid
<i>Oreopteris limbosperma</i>	Lemon-scented Fern
<i>Origanum vulgare</i>	Wild Marjoram
<i>Ornithopus perpusillus</i>	Bird's-foot
<i>Oxalis acetosella</i>	Wood-sorrel
<i>Pastinaca sativa</i>	Wild Parsnip
<i>Pedicularis sylvatica</i>	Lousewort
<i>Phyllitis scolopendrium</i>	Hart's-tongue
<i>Pilosella officinarum</i>	Mouse-ear-hawkweed
<i>Pimpinella saxifraga</i>	Burnet-saxifrage
<i>Plantago media</i>	Hoary Plantain
<i>Polygala serpyllifolia</i>	Heath Milkwort
<i>Polygala vulgaris</i>	Common Milkwort
<i>Potentilla anglica</i>	Trailing Tormentil
<i>Potentilla erecta</i>	Tormentil
<i>Potentilla sterilis</i>	Barren Strawberry
<i>Primula veris</i>	Cowslip
<i>Primula vulgaris</i>	Primrose
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus petraea</i>	Sessile Oak
<i>Rhamnus cathartica</i>	Buckthorn

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<i>Rhinanthus minor</i>	Yellow Rattle
<i>Rosa</i> spp.	Wild roses
<i>Rumex acetosella</i>	Sheep's Sorrel
<i>Sambucus nigra</i>	Elder
<i>Sanguisorba minor</i>	Salad Burnet
<i>Sanguisorba officinalis</i>	Great Burnet
<i>Saxifraga granulata</i>	Meadow Saxifrage
<i>Scabiosa columbaria</i>	Small Scabious
<i>Serratula tinctoria</i>	Saw-wort
<i>Silene dioica</i>	Red Campion
<i>Sorbus</i> spp.	Whitebeams
<i>Stachys officinalis</i>	Betony
<i>Stachys sylvatica</i>	Hedge Woundwort
<i>Stellaria graminea</i>	Lesser Stitchwort
<i>Stellaria holostea</i>	Greater Stitchwort
<i>Taxus baccata</i>	Yew
<i>Teucrium scorodonia</i>	Wood Sage
<i>Thymus polytrichus</i>	Wild Thyme
<i>Torilis japonica</i>	Upright Hedge-parsley
<i>Torilis nodosa</i>	Knotted Hedge-parsley
<i>Trifolium campestre</i>	Hop Trefoil
<i>Trisetum flavescens</i>	Yellow Oat-grass
<i>Ulex gallii</i>	Western Gorse
<i>Ulmus glabra</i>	Wych Elm
<i>Vaccinium myrtillus</i>	Bilberry
<i>Veronica chamaedrys</i>	Germander Speedwell
<i>Veronica officinalis</i>	Heath Speedwell
<i>Vicia sepium</i>	Bush Vetch
<i>Viola canina</i>	Heath Dog-violet
<i>Viola hirta</i>	Hairy Violet
<i>Viola lutea</i>	Mountain Pansy
<i>Viola riviniana</i>	Common Dog-violet
<i>Viscum album</i>	Mistletoe

Table 14 – typical butterfly and bird species of scrub and fridd in Powys

Birds	
<i>Alauda arvensis</i>	Sky Lark
<i>Anthus pratensis</i>	Meadow Pipit
<i>Anthus trivialis</i>	Tree Pipit
<i>Carduelis cannabina</i>	Common Linnet
<i>Cuculus canorus</i>	Common Cuckoo
<i>Emberiza citronella</i>	Yellowhammer
<i>Falco tinnunculus</i>	Common Kestrel
<i>Oenanthe oenanthe</i>	Northern Wheatear
<i>Pyrrhula pyrrhula</i>	Common Bullfinch
<i>Saxicola rubetra</i>	Whinchat
<i>Saxicola torquata</i>	Stonechat
<i>Sylvia borin</i>	Garden Warbler
<i>Sylvia communis</i>	Common Whitethroat
<i>Sylvia curruca</i>	Lesser Whitethroat
<i>Turdus philomelos</i>	Song Thrush
<i>Turdus torquatus</i>	Ring Ouzel
Butterflies	
<i>Argynnis aglaja</i>	Dark Green Fritillary
<i>Argynnis paphia</i>	Silver-washed Fritillary
<i>Boloria euphrosyne</i>	Pearl-bordered Fritillary
<i>Boloria selene</i>	Small Pearl-bordered Fritillary

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<i>Callophrys rubi</i>	Green Hairstreak
<i>Coenonympha pamphilus</i>	Small Heath
<i>Gonepteryx rhamni</i>	Brimstone
<i>Hipparchia semele</i>	Grayling
<i>Ochlodes sylvanus</i>	Large Skipper
<i>Pyronia tithonus</i>	Gatekeeper
<i>Neozephyrus quercus</i>	Purple Hairstreak
<i>Thymelicus sylvestris</i>	Small Skipper

H13) NEWLY CREATED HABITATS

With an increasing awareness of the widespread habitat loss and fragmentation which has occurred across the UK since the Second World War, many private landowners and businesses, as well as public bodies, are seeking to create/re-create species-rich habitats on their own land. As the express purpose of these areas is nature conservation, they can often become high value habitats within a relatively short period of time.

In some cases, when local provenance seed is not used, these habitats may comprise species not found in the local area and, as a consequence, contain locally rare/scarce species. Although artificially created, these habitats nevertheless have a high ecological value and should not be ignored by the Local Wildlife Site system. After all, even unimproved habitats of ancient provenance, are influenced by the actions of man.

When considering newly created habitats for selection as Local Wildlife Sites, the relevant habitat criteria should be used.

The following sites should be considered for selection:

- ***all undesignated artificially created habitats passing habitat criteria relevant to the habitat type and shown to have retained their nature conservation interest for a period of 10 years or more.***

SPECIES CRITERIA

Local Wildlife Sites are usually selected on the basis of habitat; it is, after all, the habitat in which the species usually depends and most sites will be of interest on both grounds. However, some sites may be significant entirely because a certain species is present and may need to be managed in a particular way to benefit this species.

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

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

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

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

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

- listed in the EC Habitats Directive, Annexes II and IV;
- listed in Section 7 of the Environment (Wales) Act 2016;
- listed having a significant conservation designation in the UK listing with the JNCC, <http://www.jncc.gov.uk/page-3409>;
- listed on Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended);

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

Sites should also be considered where these support species which are listed as 'Species of Conservation Concern', or for species which are rare, uncommon or threatened in the local context, especially where large or well-established populations are present. Assessing the comparative rarity of locally significant species and setting appropriate guidelines for selection is significantly more difficult in the absence of well-organised biological recording at the regional or local level and for many of the more difficult to identify taxa. Local experts have been consulted whilst drawing up these criteria, but there are likely to remain significant gaps in the data sets. Therefore, the precautionary approach should be applied

Criteria for the selection of Local Wildlife Sites in Powys

positively when selecting species-based Local Wildlife Sites, i.e. preferring to select sites which can be deleted at a later date when better species information becomes available.

The records for species and their status are regularly updated, so it is important that any changes which may affect the Local Wildlife Sites criteria are monitored. This document should be updated accordingly when changes are made, but if in doubt, reference should be made to the most recent priority species lists and/or consult with local experts. Local 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.

S1) MAMMALS

Being a largely landlocked County, this criteria purely considers terrestrial mammals and bats. Across Powys, 50 mammal species have been recorded, 14 of which are bats.

Some terrestrial mammals and all bats are protected under the Wildlife and Countryside Act 1981 (as amended) and Conservation of Habitats and Species Regulations (2017) (as amended). Certain species are also listed on Section 7 of the Environment (Wales) Act 2016. Legal protection is given to Badger (*Meles meles*) and their setts on welfare grounds under The Protection of Badgers Act 1992, however, the presence of breeding badgers is not considered a valid reason for site selection.

S1.2) Terrestrial mammals

Powys is an important area for a number of terrestrial mammal species. However, the distribution of once common mammals can be very patchy. European Water Vole (*Arvicola amphibius*) which has suffered severe declines across the UK is now very scarce in Powys, with the majority of extant sites found in upland areas. Similarly, the Eurasian Red Squirrel (*Sciurus vulgaris*) is now confined to Brecknock, part of a population centred on the Tywi Forest. The Hazel Dormouse (*Muscardinus avellanarius*) is widespread across suitable habitat in Montgomeryshire, but in Radnorshire and Brecknock, they are largely restricted to the east of the County. Harvest Mouse (*Micromys minutus*) appear to be now absent from Powys, although they are easy to overlook.

The West European Hedgehog (*Erinaceus europaeus*) is currently still widespread, but with continued declines across the UK, they are now listed on Section 7 of the Environment (Wales) Act 2016. Similarly, Brown Hare (*Lepus europaeus*) have suffered historic declines, but remain widespread.

This part of Wales remained a stronghold for European Otter (*Lutra lutra*) and Polecat (*Mustela putorius*) when they declined across large areas of the UK. These species have now made remarkable recoveries elsewhere and remain widespread in Powys. Pine Marten (*Martes martes*) are now also making a comeback, following a reinforcement by Vincent Wildlife Trust. All these species are very mobile and have large home ranges, meaning that numbers remain relatively low.

Many of our mammals are nocturnal/crepuscular and secretive in their habits, making them difficult to study. As a consequence there is insufficient data for many species to make rigorous assessments on population and/or range. There is an urgent requirement for more research to assess population densities in key habitats and to assess the percentage of potentially suitable habitat, where a given species actually occurs: at present, uncertainty levels are unacceptably high (Mathews et al, 2018).

The following should be considered for selection:

- ***all sites supporting recent confirmed breeding populations of any of the following:***
 - ***European Water Vole (Arvicola amphibius)*#***
 - ***West European Hedgehog (Erinaceus europaeus)****
 - ***Brown Hare (Lepus europaeus)****

Criteria for the selection of Local Wildlife Sites in Powys

- **European Otter (*Lutra lutra*)*#**
- **Pine Marten (*Martes martes*)*#**
- **Harvest Mouse (*Micromys minutus*)***
- **Hazel Dormouse (*Muscardinus avellanarius*)*#**
- **Polecat (*Mustela putorius*)***
- **Eurasian Red Squirrel (*Sciurus vulgaris*)*#**

* Species listed on Section 7 of the Environment (Wales) Act 2016.

Species listed on Schedule 5 of the Wildlife & Countryside Act 1981, as amended.

The presence of breeding populations must be determined through survey, within the previous five years, in order to qualify. Defining site boundaries will be challenging as these species range over wide areas, utilise a variety of different habitats or their ecological needs are not clearly defined. As stated in the introduction, the majority of sites will be selected on the basis of the habitat criteria, but there may be situations where the terrestrial mammal criteria would be more robust. Site boundaries should include areas which are critical for nesting, foraging, laying up, territorial or other significant use.

S1.2) Bats

Almost a quarter of the UK's mammal species are bats. Of the 18 species which have been recorded in the UK, 14 have been found in Powys, including populations of Lesser Horseshoe Bat of European significance. There are no records of Alcahioe Bat, Mouse-eared Bat or Grey Bat in Powys, however it is possible that they are present but under-recorded. Improvements in bat survey technology and the use of eDNA has led to an increased understanding of the distribution of bats. Some, like the Nathusius' Pipistrelle, may be expanding their range and moving in to new areas, whilst others, like Bechstein's Bat have very specific habitat requirements and are hard to detect.

Bats are highly mobile and require a diverse landscape to satisfy their requirements, which varies between species, gender and time of year. In addition, many roosts are found in places which would not qualify as Local Wildlife Sites under habitat criteria, but are nevertheless vital for the survival of the species.

All bats and their roosts are protected under the Wildlife and Countryside Act (1981) (as amended) and Conservation of Habitats and Species Regulations (2017) (as amended). Certain species are also listed on Section 7 of the Environment (Wales) Act 2016; these are shown in Table 14 below.

The following should be considered for selection:

- ***all undesignated sites supporting significant bat roosts, including vital flight and commuting routes and priority feeding areas.***

'Roosts' are any structure used by the bats at some time, including maternity, pre/post-maternity, hibernation, mating and male roosts. Roosts can be found in a diverse range of natural and man-made structures, from trees and caves, to mines, icehouses and bridges.

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Significance levels are given in Table 15 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. Significance levels vary with time and year and species.

Table 15 – significance levels for bats in Powys

Species		Maternity roost	Other roost types e.g. hibernation
Western Barbastelle*	<i>Barbastella barbastellus</i> *	Any	Any
Brandt's Bat	<i>Myotis brandtii</i>	10	5
Brown Long-eared Bat*	<i>Plecotus auritus</i> *	25	5
Common Pipistrelle*	<i>Pipistrellus pipistrellus</i> *	50	5
Daubenton's Bat	<i>Myotis daubentonii</i>	Any	Any
Greater Horseshoe Bat*	<i>Rhinolophus ferrumequinum</i> *	Any	Any
Lesser Horseshoe Bat*	<i>Rhinolophus hipposideros</i> *	Any	Any
Lesser Noctule	<i>Nyctalus leisleri</i>	Any	Any
Nathusius' Pipistrelle	<i>Pipistrellus nathusii</i>	Any	Any
Natterer's Bat	<i>Myotis nattereri</i>	Any	Any
Noctule Bat*	<i>Nyctalus noctula</i> *	10	5
Serotine	<i>Eptesicus serotinus</i>	Any	Any
Soprano Pipistrelle*	<i>Pipistrellus pygmaeus</i> *	120	5
Whiskered Bat	<i>Myotis mystacinus</i>	10	5

* SPECIES LISTED ON SECTION 7 OF THE ENVIRONMENT (WALES) ACT 2016.

S2) BIRDS

244 species of bird have been recorded in Powys. Birds are highly mobile and in many cases, sites are of value at specific times of the year; for breeding or wintering, or simply as important stopping points during migration.

North Powys and Ceredigion once supported the last remnant Red Kite (*Milvus milvus*) population, which has now made a spectacular recovery, thanks to conservation efforts. Another bird of prey, the Osprey (*Pandion haliaetus*) is recolonising the area following its extinction locally. On moorland, Hen Harrier (*Circus cyaneus*) are still found in small numbers, along with other species typical of this habitat, such as Red Grouse (*Lagopus lagopus*) and Sky Lark (*Alauda arvensis*). Black Grouse cling on in isolated parts of the north. In the broadleaved woodlands, declining summer migrants like Wood Warbler (*Phylloscopus sibilatrix*), Pied Flycatcher (*Ficedula hypoleuca*) and Common Redstart (*Phoenicurus phoenicurus*) breed, whilst many streams support resident White-throated Dipper (*Cinclus cinclus*) and Grey Wagtail (*Motacilla cinerea*). The Dyfi Estuary is the traditional wintering area for Greenland White-fronted Goose (*Anser albifrons flavirostris*), where they are still present, despite global declines. Many other wetland birds can be found in suitable habitat around the County at different times of the year; some, like the Great Bittern (*Botaurus stellaris*) are becoming more frequently encountered.

Tables 15 & 16 below set out an assessment of those bird species, which are considered to be of conservation significance within Powys. Selection is based on each species' status within the region using: Birds of Conservation Concern 'Red' or 'Amber' listing; the Section 7 List, or listed on schedules of the Wildlife & Countryside Act 1981 (& amendments). The precise details of numbers and any additional species, have been developed with the county bird recorders. A 'species diversity' element is also included in these guidelines.

The following should be considered for selection:

- **all undesignated sites supporting breeding populations, of any size, of species marked with an A in Table 16;**
- **all undesignated sites regularly supporting wintering or passage refuelling populations, of any size, of species marked with an A in Table 17;**
- **all undesignated sites supporting the number of breeding pairs or units as shown for those species marked with a B in Table 16;**
- **all undesignated sites regularly supporting the number of wintering/passage birds as shown for those species marked with a B in Table 17;**
- **all undesignated sites where 100 or more bird species have been recorded in the previous five years.**

Table 16 – breeding birds of conservation significance in Powys

SPECIES	COMMON NAME	W&C A Sch. 1	Sec. 7	BoCC	Local Status
<i>Anas clypeata</i>	Shoveler	-	-	Amber	A
<i>Anas crecca</i>	Eurasian Teal	-	-	Amber	A
<i>Anas querquedula</i>	Garganey	✓	-	Amber	A

Criteria for the selection of Local Wildlife Sites in Powys

<i>Anas strepera</i>	Gadwall	-	-	Amber	A
<i>Asio flammeus</i>	Short-eared Owl	-	-	Amber	A
<i>Asio otus</i>	Long-eared Owl	-	-	Green	A
<i>Calidris alpine</i>	Dunlin	-	-	Amber	A
<i>Caprimulgus europaeus</i>	European Nightjar	-	✓	Amber	A
<i>Cettia cetti</i>	Cetti's Warbler	✓	-	Green	A
<i>Charadrius dubius</i>	Little Ringed Plover	✓	-	Green	A
<i>Charadrius hiaticula</i>	Ringed Plover	-	✓	Red	A
<i>Circus cyaneus</i>	Hen Harrier	✓	✓	Red	A
<i>Coccothraustes coccothraustes</i>	Hawfinch	-	✓	Red	A
<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	-	✓	Red	A
<i>Egretta garzetta</i>	Little Egret	-	-	Green	A
<i>Falco columbarius</i>	Merlin	✓	-	Red	A
<i>Falco peregrinus</i>	Peregrine Falcon	✓	-	Green	A
<i>Falco subbuteo</i>	Eurasian Hobby	✓	-	Green	A
<i>Falco tinnunculus</i>	Common Kestrel	-	✓	Amber	A
<i>Gallinago gallinago</i>	Common Snipe	-	-	Amber	A
<i>Larus marinus</i>	Great Black-backed Gull	-	-	Amber	A
<i>Motacilla flava</i>	Yellow Wagtail	-	✓	Red	A
<i>Numenius arquata</i>	Eurasian Curlew	-	✓	Red	A
<i>Pandion haliaetus</i>	Osprey	✓	-	Amber	A
<i>Passer montanus</i>	Eurasian Tree Sparrow	-	✓	Red	A
<i>Perdix perdix</i>	Grey Partridge	-	✓	Red	A
<i>Pernis apivorus</i>	European Honey-buzzard	✓	-	Amber	A
<i>Phylloscopus sibilatrix</i>	Wood Warbler	-	✓	Red	A
<i>Pluvialis apricaria</i>	European Golden Plover	-	✓	Green	A
<i>Poecile montanus</i>	Willow Tit	-	✓	Red	A
<i>Rallus aquaticus</i>	Water Rail	-	-	Green	A
<i>Regulus ignicapilla</i>	Firecrest	✓	-	Green	A
<i>Scolopax rusticola</i>	Eurasian Woodcock	-	-	Red	A
<i>Streptopelia turtur</i>	European Turtle Dove	-	✓	Red	A
<i>Sylvia curruca</i>	Lesser Whitethroat	-	-	Green	A
<i>Tadorna tadorna</i>	Common Shelduck	-	-	Amber	A
<i>Tetrao tetrix</i>	Black Grouse	-	✓	Red	A
<i>Tringa tetanus</i>	Common Redshank	-	-	Amber	A
<i>Turdus torquatus</i>	Ring Ouzel	-	✓	Red	A
<i>Tyto alba</i>	Barn Owl	✓	-	Green	A
<i>Vanellus vanellus</i>	Northern Lapwing	-	✓	Red	A
 					
<i>Accipiter gentilis</i>	Northern Goshawk	✓	-	Green	B: ≥2 pairs
<i>Actitis hypoleucos</i>	Common Sandpiper	-	-	Amber	B: ≥2 pairs
<i>Alauda arvensis</i>	Sky Lark	-	✓	Red	B: ≥2 pairs low, ≥10 pairs hill
<i>Alcedo atthis</i>	Common Kingfisher	✓	-	Amber	B: ≥2 pairs
<i>Anas platyrhynchos</i>	Mallard	-	-	Amber	B: ≥10 pairs
<i>Anthus pratensis</i>	Meadow Pipit	-	-	Amber	B: ≥10 pairs
<i>Anthus trivialis</i>	Tree Pipit	-	✓	Red	B: ≥3 pairs
<i>Apus apus</i>	Common Swift	-	-	Amber	B: ≥5 pairs
<i>Athene noctua</i>	Little Owl	-	-	-	B: ≥2 pairs
<i>Carduelis cannabina</i>	Common Linnet	-	✓	Red	B: ≥3 pairs
<i>Carduelis cabaret</i>	Lesser Redpoll	-	✓	Red	B: ≥3 pairs
<i>Carduelis chloris</i>	European Greenfinch	-	-	Green	B: ≥5 pairs
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	-	✓	Amber	B: ≥20 pairs
<i>Cinclus cinclus</i>	White-throated Dipper	-	-	Amber	B: ≥3 pairs
<i>Columba oenas</i>	Stock Dove	-	-	Amber	B: ≥5 pairs
<i>Cuculus canorus</i>	Common Cuckoo	-	✓	Red	B: ≥3 pairs
<i>Cygnus olor</i>	Mute Swan	-	-	Amber	B: ≥2 pairs

Criteria for the selection of Local Wildlife Sites in Powys

<i>Delichon urbicum</i>	House Martin	-	-	Amber	B: ≥5 pairs
<i>Emberiza citronella</i>	Yellowhammer	-	✓	Red	B: ≥3 pairs
<i>Emberiza schoeniclus</i>	Reed Bunting	-	✓	Amber	B: ≥5 pairs
<i>Ficedula hypoleuca</i>	Pied Flycatcher	-	✓	Red	B: ≥5 pairs
<i>Haematopus ostralegus</i>	Eurasian Oystercatcher	-	-	Amber	B: ≥2 pairs
<i>Lagopus lagopus</i>	Red Grouse	-	✓	Amber	B: ≥5 pairs
<i>Larus argentatus</i>	Herring Gull	-	-	Red	B: ≥5 pairs
<i>Larus fuscus</i>	Lesser Black-backed Gull	-	-	Amber	B: ≥5 pairs
<i>Larus melanocephalus</i>	Mediterranean Gull	✓	-	Amber	B: ≥2 pairs
<i>Locustella naevia</i>	Grasshopper Warbler	-	✓	Red	B: ≥2 pairs
<i>Loxia curvirostra</i>	Common Crossbill	✓	-	Green	B: ≥5 pairs
<i>Milvus milvus</i>	Red Kite	✓	-	Green	B: ≥2 pairs
<i>Motacilla cinerea</i>	Grey Wagtail	-	-	Red	B: ≥2 pairs
<i>Muscicapa striata</i>	Spotted Flycatcher	-	✓	Red	B: ≥2 pairs
<i>Oenanthe oenanthe</i>	Northern Wheatear	-	-	Green	B: ≥2 pairs
<i>Passer domesticus</i>	House Sparrow	-	✓	Red	B: ≥20 pairs
<i>Phoenicurus phoenicurus</i>	Common Redstart	-	-	Amber	B: ≥4 pairs
<i>Picus viridis</i>	Green Woodpecker	-	-	Green	B: ≥2 pairs
<i>Poecile palustris</i>	Marsh Tit	-	✓	Red	B: ≥2 pairs
<i>Prunella modularis</i>	Hedge Accentor	-	✓	Amber	B: ≥10 pairs
<i>Pyrrhula pyrrhula</i>	Common Bullfinch	-	✓	Amber	B: ≥3 pairs
<i>Riparia riparia</i>	Sand Martin	-	-	Green	B: ≥50 onh
<i>Saxicola rubetra</i>	Whinchat	-	-	Red	B: ≥2 pairs
<i>Saxicola torquata</i>	Stonechat	-	-	Green	B: ≥2 pairs
<i>Sterna hirundo</i>	Common Tern	-	-	Amber	B: ≥2 pairs
<i>Strix aluco</i>	Tawny Owl	-	-	Amber	B: ≥5 pairs
<i>Sturnus vulgaris</i>	Common Starling	-	✓	Red	B: ≥4 pairs
<i>Sylvia borin</i>	Garden Warbler	-	-	Green	B: ≥3 pairs
<i>Turdus philomelos</i>	Song Thrush	-	✓	Red	B: ≥3 pairs
<i>Turdus viscivorus</i>	Mistle Thrush	-	-	Red	B: ≥2 pairs

W&CA Sch. 1: BIRDS LISTED ON SCHEDULE 1 OF THE WILDLIFE AND COUNTRYSIDE ACT 1981;

SEC. 7: BIRDS LISTED AS PRIORITY SPECIES ON SECTION 7 OF THE ENVIRONMENT (WALES) ACT 2016;

BoCC: BIRDS OF CONSERVATION CONCERN 4 (2015).

ONH: OCCUPIED NESTING HOLES

LOW: LOWLAND/ENCLOSED

HILL: UPLAND HILL/COMMON

Table 17 – wintering & passage birds of conservation significance in Powys

SPECIES	COMMON NAME	W&C A Sch. 1	Sec. 7	BoCC	Local Status
<i>Acrocephalus paludicola</i>	Aquatic Warbler	-	✓	Red	A
<i>Anser albifrons</i>	Greater White-fronted Goose	-	✓	Red	A
<i>Asio flammeus</i>	Short-eared Owl	-	-	Amber	A
<i>Asio otus</i>	Long-eared Owl	-	-	Green	A
<i>Botaurus stellaris</i>	Great Bittern	✓	✓	Amber	A
<i>Cettia cetti</i>	Cetti's Warbler	✓	-	Green	A
<i>Circus aeruginosus</i>	Eurasian Marsh Harrier	✓	-	Amber	A
<i>Circus cyaneus</i>	Hen Harrier	✓	✓	Red	A
<i>Cygnus columbianus subsp. bewickii</i>	Bewick's Swan	✓	✓	Amber	A
<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	-	✓	Red	A
<i>Egretta garzetta</i>	Little Egret	-	-	Green	A
<i>Falco columbarius</i>	Merlin	✓	-	Red	A

Criteria for the selection of Local Wildlife Sites in Powys

<i>Gavia stellate</i>	Red-throated Diver	✓	-	Green	A
<i>Passer montanus</i>	Eurasian Tree Sparrow	-	✓	Red	A
<i>Perdix perdix</i>	Grey Partridge	-	✓	Red	A
<i>Poecile montanus</i>	Willow Tit	-	✓	Red	A
<i>Rallus aquaticus</i>	Water Rail	-	-	Green	A
<i>Recurvirostra avosetta</i>	Pied Avocet	✓	-	Amber	A
<i>Tyto alba</i>	Barn Owl	✓	-	Green	A
 					
<i>Alauda arvensis</i>	Sky Lark	-	✓	Red	B: ≥20
<i>Alcedo atthis</i>	Common Kingfisher	✓	-	Amber	B: ≥2
<i>Anas acuta</i>	Northern Pintail	-	-	Amber	B: ≥5
<i>Anas clypeata</i>	Shoveler	-	-	Amber	B: ≥10
<i>Anas crecca</i>	Eurasian Teal	-	-	Amber	B: ≥30
<i>Anas penelope</i>	Eurasian Wigeon	-	-	Amber	B: ≥25
<i>Anas platyrhynchos</i>	Mallard	-	-	Amber	B: ≥100
<i>Anas querquedula</i>	Garganey	✓	-	Amber	B: ≥5
<i>Anas strepera</i>	Gadwall	-	-	Amber	B: ≥10
<i>Anthus pratensis</i>	Meadow Pipit	-	-	Amber	B: ≥500
<i>Arenaria interpres</i>	Ruddy Turnstone	-	-	Amber	B: ≥10
<i>Aythya farina</i>	Common Pochard	-	-	Red	B: ≥5
<i>Aythya marila</i>	Greater Scaup	✓	-	Red	B: ≥2
<i>Branta bernicla subsp. bernicla</i>	Dark-bellied Brent Goose	-	✓	Amber	B: ≥5
<i>Bucephala clangula</i>	Common Goldeneye	-	-	Amber	B: ≥5
<i>Calidris alpine</i>	Dunlin	-	-	Amber	B: ≥50
<i>Calidris canutus</i>	Red Knot	-	-	Amber	B: ≥10
<i>Carduelis cabaret</i>	Lesser Redpoll	-	✓	Red	B: ≥50
<i>Carduelis cannabina</i>	Common Linnet	-	✓	Red	B: ≥50
<i>Carduelis chloris</i>	European Greenfinch	-	-	Green	B: ≥30
<i>Carduelis flavirostris</i>	Twite	-	✓	Red	B: ≥2
<i>Charadrius hiaticula</i>	Ringed Plover	-	✓	Red	B: ≥10
<i>Coccothraustes coccothraustes</i>	Hawfinch	-	✓	Red	B: ≥5
<i>Columba oenas</i>	Stock Dove	-	-	Amber	B: ≥50
<i>Cygnus cygnus</i>	Whooper Swan	✓	-	Amber	B: ≥2
<i>Cygnus olor</i>	Mute Swan	-	-	Amber	B: ≥20
<i>Emberiza citronella</i>	Yellowhammer	-	✓	Red	B: ≥15
<i>Emberiza schoeniclus</i>	Reed Bunting	-	✓	Amber	B: ≥20
<i>Falco peregrinus</i>	Peregrine Falcon	✓	-	Green	B: ≥2
<i>Falco tinnunculus</i>	Common Kestrel	-	✓	Amber	B: ≥2
<i>Gallinago gallinago</i>	Common Snipe	-	-	Amber	B: ≥10
<i>Haematopus ostralegus</i>	Eurasian Oystercatcher	-	-	Amber	B: ≥25
<i>Larus marinus</i>	Great Black-backed Gull	-	-	Amber	B: ≥3
<i>Limosa lapponica</i>	Bar-tailed Godwit	-	✓	Amber	B: ≥5
<i>Limosa limosa</i>	Black-tailed Godwit	✓	-	Red	B: ≥10
<i>Melanitta nigra</i>	Common Scoter	✓	✓	Red	B: ≥5
<i>Motacilla flava</i>	Yellow Wagtail	-	✓	Red	B: ≥5
<i>Numenius arquata</i>	Eurasian Curlew	-	✓	Red	B: ≥10
<i>Numenius phaeopus</i>	Whimbrel	✓	-	Red	B: ≥5
<i>Passer domesticus</i>	House Sparrow	-	✓	Red	B: ≥100
<i>Phalacrocorax carbo</i>	Great Cormorant	-	-	Green	B: ≥25 (R)
<i>Picus viridis</i>	Green Woodpecker	-	-	Green	B: ≥2
<i>Pluvialis apricaria</i>	European Golden Plover	-	✓	Green	B: ≥25
<i>Pluvialis squatarola</i>	Grey Plover	-	-	Amber	B: ≥5
<i>Poecile palustris</i>	Marsh Tit	-	✓	Red	B: ≥2
<i>Pyrrhula pyrrhula</i>	Common Bullfinch	-	✓	Amber	B: ≥20
<i>Regulus ignicapilla</i>	Firecrest	✓	-	Green	B: ≥2
<i>Saxicola torquata</i>	Stonechat	-	-	Green	B: ≥10
<i>Scolopax rusticola</i>	Eurasian Woodcock	-	-	Red	B: ≥5
<i>Sterna hirundo</i>	Common Tern	-	-	Amber	B: ≥10

Criteria for the selection of Local Wildlife Sites in Powys

<i>Sterna paradisaea</i>	Arctic Tern	-	-	Red	B: ≥5
<i>Sterna sandvicensis</i>	Sandwich Tern	-	-	Amber	B: ≥5
<i>Sturnus vulgaris</i>	Common Starling	-	✓	Red	B: ≥10,000 (R)
<i>Tadorna tadorna</i>	Common Shelduck	-	-	Amber	B: ≥5
<i>Tringa tetanus</i>	Common Redshank	-	-	Amber	B: ≥10
<i>Turdus iliacus</i>	Redwing	✓	-	Red	B: ≥500
<i>Turdus philomelos</i>	Song Thrush	-	✓	Red	B: ≥20
<i>Turdus pilaris</i>	Fieldfare	✓	-	Red	BL ≥250
<i>Turdus torquatus</i>	Ring Ouzel	-	✓	Red	B: ≥5
<i>Turdus viscivorus</i>	Mistle Thrush	-	-	Red	B: ≥20
<i>Tyto alba</i>	Barn Owl	✓	-	Green	B: ≥4
<i>Vanellus vanellus</i>	Northern Lapwing	-	✓	Red	B: ≥40

W&CA Sch. 1: BIRDS LISTED ON SCHEDULE 1 OF THE WILDLIFE AND COUNTRYSIDE ACT 1981;

Sec. 7: BIRDS LISTED AS PRIORITY SPECIES ON SECTION 7 OF THE ENVIRONMENT (WALES) ACT 2016;

BoCC: BIRDS OF CONSERVATION CONCERN 4 (2015).

(R): ROOSTS

S3) HERPETOFAUNA (REPTILES & AMPHIBIANS)

There are 12 species of non-marine reptiles and amphibians (collectively termed herpetofauna) generally accepted to be native to Britain, 9 of which occur in Powys. The British herpetofauna occurs across a wide range of habitats and exhibits a variety of reproductive modes, behaviours and survival strategies. Despite often being grouped together for the purpose of academic study and conservation, amphibians and reptiles have very distinct differences in biology. The key features common to both amphibians and reptiles are: ectothermy (the dependence on external sources of heat to allow activity, because of an inability to raise body temperatures via internal means), small size, lack of truly social behaviour and relatively modest dispersal abilities.

There is growing concern that even our widespread amphibian and reptile species are in national decline. All native amphibian and reptile species are protected by the Wildlife & Countryside Act 1981 (as amended), but the level of protection varies; Smooth Newt, Palmate Newt, Common Frog and Common Toad are all protected against sale only, whilst the others are protected against injury & killing, as well as sale. The Great Crested Newt (as well as 3 others not found in Powys) is also protected under the Conservation of Habitats and Species Regulations (2017) (as amended). Eight herpetofauna species are listed on Section 7 of the Environment (Wales) Act 2016.

S3.1) REPTILES

Of the six native reptile species in the UK, four are known to live in Powys; two lizards - Common Lizard (*Zootoca vivipara*) and Slow-worm (*Anguis fragilis*) – and two snakes – Grass Snake (*Natrix helvetica*) and Adder (*Vipera berus*). Grass Snake are particularly abundant round the Montgomery Canal in Montgomeryshire, but uncommon elsewhere. Both Common Lizard and Slow-worm can be locally abundant in suitable habitat. Adder are now rare in Powys; the majority of recent Adder sightings are a case of mistaken identity, usually turning out to be Grass Snake.

All four reptile species found in Powys are listed on Section 7 of the Environment (Wales) Act 2016, meaning they should be a priority for conservation action.

The following should be considered for selection:

- ***all undesignated sites with confirmed presence of Adder within the previous 5 years;***
- ***all undesignated sites supporting three or more reptile species;***
- ***all undesignated sites supporting good populations of any reptile species.***

Unfortunately there is no easy method available to establish the size of reptile populations. Variation in detectability of individuals, populations and species over time and between sites remains a challenge to standardization of survey protocols. More guidance on survey techniques for reptiles can be found in Sewell et al, 2013. Provided that an appropriate level of survey (covering geographical area & sufficient intensity of effort) has been undertaken by competent surveyors, 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.

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).

S3.2) AMPHIBIANS

Five of the seven UK native amphibian species have been recorded in Powys; Common Frog (*Rana temporaria*), Common Toad (*Bufo bufo*) and three species of newt. Palmate Newt (*Lissotriton helveticus*), Common Frog and Common Toad are widespread across the County, whilst Great Crested Newt (*Triturus cristatus*) and Smooth Newt (*Lissotriton vulgaris*) have a more eastern bias. There is also a population of the non-native Midwife Toad (*Alytes obstetricans*) around Llandrindod Wells, which is thought to be a deliberate introduction and is spreading.

The Great Crested Newt has declined markedly across much of its western European range and is now recognized as threatened in many European countries. British populations are considered to be internationally important, as some are among the largest within Europe. For this reason, Great Crested Newts and their 'breeding sites' or 'resting places' are protected under the Wildlife and Countryside Act (1981) (as amended) and Conservation of Habitats and Species Regulations (2017) (as amended). They are also listed on Section 7 of the Environment (Wales) Act 2016. Common Toad is also a Section 7 species.

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;***
- ***sites supporting 10 or more Great Crested Newts, counted by torchlight survey.***

For the purpose of these guidelines, 'good' and 'exceptional' populations 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
Great Crested Newt	Torchlight count of adults at night*	10	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).

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. Groups of ponds may be selected as single sites where these all lie reasonably close to each other and there is a good probability that there is migration of

Criteria for the selection of Local Wildlife Sites in Powys

amphibians between the ponds, together with an appropriate surrounding area of terrestrial habitat. Indeed, the grouping of breeding ponds as a 'pond cluster' is recommended for Great Crested Newts in order to create well-connected, functional habitat for the species.

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.

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).

S4) FISH

About 38 native fish species occur in Britain, including estuarine and inshore species, two of which (Burbot and Houting) are probably now extinct. 35 species of fish have been recorded in Powys, of which 29 are native. Knowledge of distribution and population sizes is imprecise and confused due to the difficulty and patchiness of sampling and the activities of anglers who have translocated species and artificially reinforced populations in many waters.

Of the naturally occurring species, the following are of direct conservation concern in Wales (drawn from Wildlife Sites Guidance Wales 2008, which was based on Grice 1994; Maitland & Campbell 1992):

Table 18 – Freshwater fish of conservation significance in Powys

International/National UK Significant						
Species	Type	IUCN Red List Status	Sec. 7	WCA/EC	Bern	
*Allis Shad	<i>Alosa alosa</i>	Ea	LC	Y	WCA, ECII, ECV	Y
*Twait Shad	<i>Alosa fallax</i>	Ea	LC	Y	WCA, ECII, ECV	Y
*European Eel	<i>Anguilla anguilla</i>	Ea	CR	Y	WCA	N
Bullhead	<i>Cottus gobio</i>	S	LC	N	ECII	N
River Lamprey	<i>Lampetra fluviatilis</i>	Ea	LC	Y	ECII, ECV	Y
Brook Lamprey	<i>Lampetra planeri</i>	E	LC	N	ECII	Y
*Sea Lamprey	<i>Petromyzon marinus</i>	Ea	LC	Y	ECII	Y
Atlantic Salmon	<i>Salmo salar</i>	Ea	LC	Y	ECII, ECV	Y
*Grayling	<i>Thymallus thymallus</i>	S	LC	N	ECV	Y
Regionally Significant						
*Bleak	<i>Alburnus alburnus</i>	S	LC	N	N	N
Brown/Sea Trout	<i>Salmo trutta</i>	S/Ea	LC	Y	N	N

TYPE: E = EURYHALINE (LIVES IN BOTH SALT & FRESHWATER); S = STENOHALINE (FRESHWATER ONLY); a = ANADROMOUS (MATURES IN SEA, MIGRATES INTO FRESHWATER TO SPAWN)

IUCN RED LIST STATUS: LC = LEAST CONCERN; CR = CRITICALLY ENDANGERED

SEC. 7: LISTED ON SECTION 7 OF THE ENVIRONMENT (WALES) ACT 2016

WCA/EC: WCA = PROTECTED UNDER THE WILDLIFE & COUNTYSIDE ACT 1981 (AS AMENDED); ECII = LISTED ON ANNEX 2 OF EUROPEAN HABITATS DIRECTIVE (1992), I.E. CORE AREAS OF THEIR HABITAT ARE DESIGNATED AS SITES OF COMMUNITY IMPORTANCE (SCIS) AND INCLUDED IN THE NATURA 2000 NETWORK. THESE SITES MUST BE MANAGED IN ACCORDANCE WITH THE ECOLOGICAL NEEDS OF THE SPECIES; ECV = LISTED ON ANNEX 5 OF EUROPEAN HABITATS

Criteria for the selection of Local Wildlife Sites in Powys

DIRECTIVE (1992), I.E. MEMBER STATES MUST ENSURE THAT THEIR EXPLOITATION AND TAKING IN THE WILD IS COMPATIBLE WITH MAINTAINING THEM IN A FAVOURABLE CONSERVATION STATUS.

The following should be considered for selection:

- ***all undesignated waterbodies supporting recently (within previous 5 years) confirmed resident and/or spawning and/or juvenile populations of one or more species marked by * bold in Table 18;***
- ***all undesignated watercourses regularly used as major migratory routes by one or more anadromous species listed in Table 18;***
- ***all undesignated waterbodies supporting at least five of the species listed in Table 18, all recorded within the previous five years.***

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.

S5) INVERTEBRATES

Invertebrates are generally inconspicuous but they dominate biodiversity; in Welsh terrestrial and freshwater environments there are thought to be more than 20,000 different species of macro-invertebrates. Invertebrates occupy all possible habitats from crevices in inter-tidal rocks to scree on the summits of our mountain tops, from birds' nests to saturated moss at the edge of waterfalls. This extraordinary diversity is possible because of the specialised niches that many species inhabit as a result of their adaptations to specific environmental conditions. They are also crucially important to the health of ecosystems.

Some taxa such as Lepidoptera (butterflies and moths), Odonata (dragonflies and damselflies) and to a lesser degree, 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. All species have a life cycle which comprises several distinct phases i.e. egg/larvae/pupae/adult or egg/nymph/adult, meaning that a combination of conditions and habitats are usually required by each species for each of these stages; often microhabitats such as dead wood or small areas of bare ground may be important in sustaining a species.

There are eight non-marine invertebrates included on Annex II of the EC Habitats & Species Directive that occur in Wales, represented here on 22 Special Areas of Conservation. Twelve species are given Full Protection under Schedule 5 of the Wildlife & Countryside Act and Section 7 of the Environment (Wales) Act lists 215 invertebrate species.

The following should be considered for selection:

- ***all undesignated sites which support populations of one or more species, which is listed in the UK Red Data Book, or listed on Section 7 of the Environment (Wales) Act 2016, with the specific requirement for site protection action;***
- ***all undesignated sites which support one or more bee species listed on the Wales Threatened Bee Report (Olds et al.,+ 2019);***
- ***all undesignated sites which support an important assemblage or population(s) of 'Nationally Scarce' species (to be determined in consultation with appropriate experts);***
- ***all undesignated sites which support a species, recorded from 10 or fewer 10km grid squares in Wales (where the distribution is well known);***
- ***all undesignated sites which support a species that breeds in 4 or fewer sites within a Vice County;***
- ***all undesignated sites which support a significant population or assemblage of Local Priority Species listed in the Powys Nature Recovery Action Plan;***
- ***all undesignated sites supporting an assemblage of invertebrate species considered to be of significance (to be determined in consultation with appropriate experts); for example, 9 or more Odonata species, 7 or more Orthoptera species.***

Criteria for the selection of Local Wildlife Sites in Powys

To determine significance and especially in the case of less well-known taxa, it is essential that appropriate specialists and Vice-County recorders are consulted as part of the selection process.

The term 'supports' refers to any verified record of a species of wild occurrence in a possible breeding habitat. In general it should therefore be assumed that a record of a species from a site fulfils the 'supports' criteria unless there is evidence to the contrary; e.g. the species is an obvious migrant or in totally unsuitable breeding or foraging habitat.

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 criteria.

The status of UK aculeate Hymenoptera, with new red data book classifications is currently under review. In the interim, the Wales Threatened Bee Report (Olds et al., 2019) provides a reasonable starting point. This report identified 64 bee species recorded from Wales that are of conservation concern. The authors identified 26 threatened bees in Wales and 38 species of conservation concern. Some species listed in the report were not known by the authors to be present in Powys, but have since been recorded here, so it is possible that more of these species are present.

Selection 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.

Determination of site boundaries should reflect the habitat and structural diversity needed to sustain a species.

S6) VASCULAR PLANTS

Powys has a very diverse flora as a result of the diversity of habitats and altitudes, as well as the County's central location in Britain. Despite this, declines seen elsewhere have also been experienced here. Of the 1,467 native and archaeophyte (naturalised in Britain before the 16th Century) vascular plants recorded in Wales, 38 are extinct (2.6%) and 256 (17.4%) are threatened with extinction, being either Critically Endangered (3.4%), Endangered (4.4%) or Vulnerable (9.7%); a further 28 (1.9%) are Near Threatened (Dinas, 2008).

The Vascular Plant Red Data Book for Wales lists 308 species, of which 54 are under threat. There are 41 species listed as nationally rare or scarce. There are 77 species of vascular plants and one Hieracium sp. group listed on Section 7 of the Environment (Wales) Act 2016.

The following should be considered for selection:

- ***all undesignated sites with one or more vascular plant species listed as Nationally Scarce (NS), Nationally Rare (NR), Vulnerable (VU), Endangered (EN) or Critically Endangered (CR) in the Vascular Plant Red Data Book, and/or listed on Section 7 of the Environment (Wales) Act 2016, and/or listed as 'rare' or 'scarce' on the county rare plant registers;***
- ***all undesignated sites with 5 or more vascular plant species, or a significant population (to be determined in consultation with appropriate experts) of one or more vascular plant species, listed on the county rare plants registers as 'uncommon' or 'threatened'.***

When considering Local Wildlife Site selection on the basis of rare vascular plants, it is important to understand the ecology and habitat requirements of the species. In some cases, site selection may not be appropriate; for example, some species, such as arable weeds, can be very ephemeral in nature and may disappear completely the year after selection.

The status of some plant species will change over time, so the above criteria should refer to the most up to date Red Data Books; these are currently Dines, 2008 for Wales and Cheffing et al., 2005 for GB. The Botanical Society of British & Ireland (BSBI) maintains a list of conservation statuses for all UK plants: bsbi.org, as well as links to the county rare plant registers.

S7) BRYOPHYTES (MOSESSES, LIVERWORTS & HORNWORTS)

“In both number of species and their individual abundance, this ‘Atlantic’ element of the bryophyte flora is more strongly represented in the British Isles than any other part of Europe.” (Ratcliffe, 1968). Given that most mosses and liverworts thrive in moist conditions, it is hardly surprising that a large proportion of the British species occur in Wales - 811 (73%) of the 1,110 British species.

In Powys, as elsewhere in Wales, bryophytes can be found in all habitats. Sphagnum mosses form the major component of peat bogs, holding as much as twenty-times their own weight in water. In a few upland wetlands the rare Bog Pawwort (*Barbilophozia kunzeana*) can be found. The ground layer of Atlantic oak and ash woodlands are carpeted with a great diversity of mosses. On sunny rock outcrops in the upper/middle River Usk, the rare Welsh Thread-moss (*Bryum gemmiparum*) grows. Rigid Apple-moss (*Bartramia stricta*) has its only UK site on droughted volcanic rocks in Radnorshire.

Already, 26 mosses and liverworts (3%) are believed to have been lost from Wales in the last 150 years and another 173 have shown such significant declines and/or have such restricted ranges, that they are threatened with extinction. 34% of the Welsh bryophyte flora requires action to safeguard it for the future or to understand its true status (Bosanquet & Dines, 2011). The Bryophyte Red Data Book for Wales lists 158 species under threat. 52 species and 1 assemblage are listed on Section 7 of the Environment (Wales) Act 2016.

The following should be considered for selection:

- ***all undesignated sites supporting one or more bryophyte species which are listed as Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) on the UK or Welsh Red Data Book/List, and/or listed on Section 7 of the Environment (Wales) Act 2016.***

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

The status of bryophytes species will change over time, so the above criteria should refer to the most up to date Red Data Books; this is currently Bosanquet & Dines, 2011 for Wales.

S8) LICHENS

Lichens are remarkable organisms and consist of a symbiotic association between two or more organisms, namely fungi and one or more photosynthetic partners (green alga and/or cyanobacteria). Easy to overlook and difficult to study, lichens typically grow slowly and some are excellent environmental indicators, often sensitive to changes in air quality. Powys has a great diversity of lichens, including a number of rare species, such as the River Jelly Lichen (*Collema dichotomum*), which is found amongst other sites, in the River Irfon, at its largest known Welsh population. Trees and woodland form an important habitat for lichens; the woodlands at Gregynog in Montgomeryshire form one of the most important sites for old growth dependant epiphytic lichens in Britain and Western Europe. Many isolated ancient pasture woodland trees have no statutory protection and yet support internationally important lichen species such as *Caloplaca herbidella* and *Lecanora sublivescens*.

Despite being just 11% of mainland Britain, Wales supports 68% of the total British lichen flora. Sadly, of the 1,290 species studied, 22 are considered extinct, whilst a further 204 are threatened with extinction; there is insufficient information for another 152 for a threat category to be assigned to them (Woods 2010). There are 67 species of lichens listed on Section 7 of the Environment (Wales) Act 2016. Two lichen-dominated communities are also listed on Section 7; the Lobarion and ones dominated by heavy-metal tolerant lichens: the metallophytes. Appendix 1 in Woods (2010) typifies them.

The following should be considered for selection:

- ***all undesignated sites supporting one or more lichen species which is listed as Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) on the UK or Welsh Lichen Red Data Books/Lists and/or listed on Section 7 of the Environment (Wales) Act 2016;***
- ***all undesignated sites supporting one or more lichen species recorded from 3 or fewer sites within a Watsonian Vice County (where the distribution is well known);***
- ***all undesignated sites supporting well-developed examples of the Lobarion, metallophyte, or other uncommon lichen communities.***

The status of lichen species will change over time, so the above criteria should refer to the most up to date Red Data Books; this is currently Woods, 2010 for Wales.

S9) FUNGI

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

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

The need to include specific Local Wildlife Site selection criteria for fungi is exemplified by the unimproved grassland fungi communities. These fungi, including waxcaps, fairy clubs and earthtongues are very sensitive to grassland improvement and can appear in grassland which has seemingly little botanical interest, only showing their true value in autumn. This has led to them being over-looked and yet, a number of sites are amongst the very best in Europe for grassland fungi; despite its small size, Wales supports over half the number of waxcap fungi in Britain.

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

The Red Data List of Threatened British Fungi (Evans et al, 2006) assessed over 800 fungi taxa, assigning nearly 400 threat categories. There are 27 species listed on Section 7 of the Environment (Wales) Act 2016. Red Data assessments have also been carried out for both rust fungi (Woods et al., 2015) and smut fungi and their allies (Woods et al., 2018) in Wales. Over 300 species have been assessed and more than 70 have been assigned a threat status.

The following should be considered for selection:

- ***all undesignated sites supporting one or more fungus species which is listed as Critically Endangered, Endangered, or Vulnerable on the UK or Welsh Red Data Books/Lists and/or listed on Section 7 of the Environment (Wales) Act 2016.***
- ***all undesignated sites supporting one or more fungus species recorded from 3 or fewer sites within a Watsonian Vice County (where the distribution is well known).***
- ***all undesignated ‘waxcap’ grassland sites reaching a score of 12-29, using the system outlined in Box 1 below.***

Box 1 - Assessing the quality of a waxcap grassland (taken from Harries & Lamacraft, 2013)

Look for the different coloured mushroom-like fungi and for each colour-group add together the relevant points:

- | | |
|--|----------|
| ▪ Red (e.g. <i>Hygrocybe coccinea, punicea, splendidissima</i>) | 5 points |
| ▪ Pink (e.g. <i>H. calyptriformis</i>) | 5 points |
| ▪ Orange (e.g. <i>H. reidii, quieta, laeta</i>) | 2 points |
| ▪ Buff/brown (e.g. <i>H. pratensis</i>) | 2 points |
| ▪ Yellow (e.g. <i>H. chlorophana, glutinipes</i>) | 2 points |
| ▪ Orange/yellow turning black (e.g. <i>H. conica</i>) | 1 point |
| ▪ Green (e.g. <i>H. psittacina</i>) | 1 point |
| ▪ White (e.g. <i>H. virginia</i>) | 1 point |

Are there other grassland fungi? Add the points for the following groups:

- | | |
|--|----------|
| ▪ Violet coral (<i>Clavariazollingeri</i>) | 5 points |
| ▪ Yellow/white coral | 1 point |
| ▪ Beige/brown coral | 2 points |
| ▪ Earthtongue (any) | 2 points |

What is your final score?

0-4: low grassland fungi interest likely

5-11: moderate interest, worthy of further investigation

12-29: sites deemed good for grassland fungi

It is important to note that this type of assessment is based upon fruiting alone which can vary significantly year to year, depending upon the weather conditions. Therefore a full evaluation can only be made following visits to sites over multiple years.

The criteria do not attempt designation of Local Wildlife Sites on the basis of overall larger fungus diversity. Fungus recording has not been extensive or systematic enough in Wales for this to be usefully applied to the selection of Local Wildlife Sites. It is hoped that particularly diverse sites for fungi will be picked up by other Local Wildlife Site criteria, either relating to fungi, other taxa, or general vegetation characteristics. However, advice from local fungi experts should be sought where this is not the case.

The status of fungi species will change over time, so the above criteria should refer to the most up to date Red Data Books; this is currently Evans et al., 2006 for Great Britain and Woods et al., 2015 and Woods et al., 2018, in Wales.

S10) CHAROPHYTES (STONEWORTS)

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

Stoneworts are good indicators of water quality as they are sensitive to pollution, including nutrient enrichment. Many are of conservation importance; 30 species have been recorded in the UK and 17 of these occur in Wales. Of the latter, 4 are Red Data Book species, 6 are Nationally Scarce and 9 are considered rare in Wales. There are five species listed on Section 7 of the Environment (Wales) Act 2016, but only one of these is recorded in Powys: Slender Stonewort (*Nitella gracilis*). The only other *Nitella* species currently known from Powys are both nationally scarce - Smooth Stonewort (*Nitella flexilis*) and Pointed Stonewort (*Nitella mucronata*). All the known Powys records for these three species are within currently protected sites or Local Wildlife Sites; i.e. the Montgomery Canal SSSI & SAC, Cwm Gwynllyn SSSI and Llyn Ebyr LWS, however, these criteria have been written in case any new sites are found.

The following should be considered for selection:

- ***all undesignated sites supporting one or more stonewort species listed as Critically Endangered, Endangered, or Vulnerable on the UK or Welsh Red Data Book/List and/or listed on Section 7 of the Environment (Wales) Act 2016;***
- ***all undesignated sites supporting one or more stonewort species recorded from 3 or fewer sites within a Watsonian Vice County (where the distribution is well known).***

The status of stonewort species will likely change over time, so the above criteria should refer to the most up to date Red Data Book(s); this is currently Stewart & Church, 1993.

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APPENDIX 1

Example Local Wildlife Site report

Radnorshire Wildlife Trust

Wildlife Sites Inventory 2019

CORS PORFFOR

File code: WS200



Site Details

Grid ref: SN923456

Nearest town or village: Llangammarch Wells

Vice-county: Radnorshire

Reason for selection: H8: Bogs

Habitat: Raised bog - M17 & M18, with M25 & M14.

Area: 30.5 hectares

Altitude: 300 metres

First listed: 2006

Last Survey: 22/08/2017

Site Status: Local Wildlife Site

Site Description:

Cors Porffor is an upland raised peat bog dominated by various *Sphagnum* species, widespread Ling (*Callina vulgaris*) & Cross-leaved Heath (*Erica tetralix*), with patches of Common Cottongrass (*Eriophorum angustifolium*) & Hare's-tail Cottongrass (*E. vaginatum*) and frequent bog pools supporting Round-leaved Sundew (*Drosera rotundifolia*) & Bog Asphodel (*Narthecium ossifragum*). Along the old forestry rides and in the areas where some of the larger trees were recently felled, the habitat is more consistent with wet modified bog with sparse ericoids and more frequent Purple Moor-grass (*Molinia caerulea*) and Deer-grass (*Trichophorum germanicum*).

Of particular note are the good populations of Bog Rosemary (*Andromeda polifolia*), which is frequent across the central bog, as well as occasional White Beak-sedge (*Rhynchospora alba*). There are scattered small Sitka Spruce (*Picea sitchensis*) trees across the bog, invading from the remains of the conifer plantation, which still surrounds the site.

Management:

The site was drained and planted with Sitka Spruce in 1984, but this plantation largely failed. The current landowners are sympathetic and have previously carried out bog restoration work, with the help of the Trust. A large area of conifers was removed, leaving the larger trees round the boundary to retain the micro-climate. Peat dams were created in October 2006. Occasional light grazing from neighbouring sheep gaining access to the site via deteriorating fences was once observed and is still likely.

WILDLIFE SITE ASSESSMENT/VERDICT

Cors Porffor passes the 2019 Powys Local Wildlife Site criteria for the following reason(s):

- undesignated degraded bog habitats supporting one or more vascular plant species of restricted distribution in Powys:
 - Bog Rosemary (*Andromeda polifolia*);
 - White Beak-sedge (*Rhynchospora alba*).

In addition to the above, Cors Porffor is a Section 7 priority habitat supporting four Section 7 species: Common Lizard (*Zootoca vivipara*), Sky Lark (*Alauda arvensis*), Song Thrush (*Turdus philomelos*) & Brown Hare (*Lepus europaeus*).

Cors Porffor appears much as it was during the last survey in 2006 and is an important local site. The bog restoration work has been partially successful, but some of the peat dams have failed. The site would likely benefit from further 're-wetting'. It would also be beneficial to remove more conifers, particularly those growing on the central bog area.

Local Wildlife Sites assessment by: Tammy Stretton, Montgomeryshire Wildlife Trust

Date: 04/08/2019

Assessed & ratified by Powys Local Wildlife Sites Partnership on: 12/10/2019

Date landowner permission granted: 11/11/2019

Due for re-survey: on or before 1st August 2019

Species List for Cors Porffor, SN923456 at 04/08/2019

Genus	Taxon	Common Name	First	Last
Birds	<i>Alauda arvensis</i>	Skylark	24-Mar-05	24-Mar-05
Birds	<i>Anthus pratensis</i>	Meadow Pipit	10-May-07	22-Aug-17
Birds	<i>Buteo buteo</i>	Buzzard	10-May-07	10-May-07
Birds	<i>Carduelis cabaret</i>	Lesser Redpoll	12-Apr-05	12-Apr-05
Birds	<i>Corvus corax</i>	Raven	04-Oct-06	04-Oct-06
Birds	<i>Erithacus rubecula</i>	Robin	10-May-07	10-May-07
Birds	<i>Fringilla coelebs</i>	Chaffinch	12-Apr-05	12-Apr-05
Birds	<i>Gallinago gallinago</i>	Snipe	04-Oct-06	04-Oct-06
Birds	<i>Garrulus glandarius</i>	Jay	22-Aug-17	22-Aug-17
Birds	<i>Milvus milvus</i>	Red Kite	02-Sep-05	02-Sep-05
Birds	<i>Periparus ater</i>	Coal Tit	18-Mar-05	18-Mar-05
Birds	<i>Phylloscopus collybita</i>	Chiffchaff/willow warbler	22-Aug-17	22-Aug-17
Birds	<i>Phylloscopus trochilus</i>	Willow Warbler	10-May-07	10-May-07
Birds	<i>Regulus regulus</i>	Goldcrest	10-May-07	10-May-07
Birds	<i>Saxicola torquatus</i>	Stonechat	04-Oct-06	09-Oct-06
Birds	<i>Troglodytes troglodytes</i>	Wren	10-May-07	10-May-07
Birds	<i>Turdus merula</i>	Blackbird	04-Oct-06	04-Oct-06
Birds	<i>Turdus philomelos</i>	Song Thrush	18-Mar-05	18-Mar-05
Birds	<i>Turdus pilaris</i>	Fieldfare	21-Mar-05	21-Mar-05
Fungi_lichens	<i>Cladonia</i>	Fungus	05-Jul-05	22-Aug-17
Fungi_lichens	<i>Cladonia ciliata</i>	Lichen	01-Jun-05	01-Jun-05
Fungi_lichens	<i>Cladonia floerkeana</i>	Lichen	01-Jun-05	22-Aug-17
Fungi_lichens	<i>Cladonia polydactyla</i>	Lichen	01-Jun-05	01-Jun-05
Fungi_lichens	<i>Cladonia portentosa</i>	Lichen	01-Jun-05	01-Jun-05
Fungi_lichens	<i>Cladonia squamosa</i>	Lichen	01-Jun-05	01-Jun-05
Fungi_lichens	<i>Cladonia uncialis</i>	Lichen	04-Aug-07	04-Aug-07
Fungi_lichens	<i>Hypogymnia physodes</i>	Lichen	01-Jun-05	01-Jun-05
Fungi_lichens	<i>Lactarius</i>	milkcap fungus	19-Sep-05	19-Sep-05
Fungi_lichens	<i>Peltigera</i>	Lichen	05-Jul-05	11-Aug-05
Fungi_lichens	<i>Peltigera</i>	dog lichen	05-Jul-05	11-Aug-05
Fungi_lichens	<i>Peltigera sp</i>	Lichen	22-Aug-17	22-Aug-17
Fungi_lichens	<i>Russula</i>	brittlepill fungus	11-Aug-05	11-Aug-05
Fungi_lichens	<i>Usnea florida</i>	Lichen	01-Jun-05	01-Jun-05
Herpetofauna	<i>Rana temporaria</i>	Common Frog	11-Aug-05	22-Aug-17
Herpetofauna	<i>Zootoca vivipara</i>	Common Lizard	12-Apr-05	12-Apr-05
Insects_beetles	<i>Adalia decempunctata</i>	Ten-Spot Ladybird	01-Oct-05	01-Oct-05
Insects_butterflies	<i>Aphantopus hyperantus</i>	Ringlet	19-Jul-00	04-Aug-07
Insects_butterflies	<i>Inachis io</i>	Peacock	02-Sep-05	22-Aug-17
Insects_butterflies	<i>Lycaena phlaeas</i>	Small Copper	02-Sep-05	02-Sep-05
Insects_butterflies	<i>Maniola jurtina</i>	Meadow Brown	19-Jul-00	19-Jul-00
Insects_butterflies	<i>Pieris brassicae</i>	Large White	02-Sep-05	02-Sep-05
Insects_butterflies	<i>Pieris napi</i>	Green-veined White	19-Jul-00	22-Aug-17
Insects_butterflies	<i>Vanessa atalanta</i>	Red Admiral	03-Oct-06	22-Aug-17
Insects_butterflies	<i>Vanessa cardui</i>	Painted Lady	02-Sep-05	02-Sep-05
Insects_moths	<i>Anarta myrtilli</i>	Beautiful Yellow Underwing	04-Aug-07	04-Aug-07
Insects_moths	<i>Autographa gamma</i>	Silver Y	02-Sep-05	02-Sep-05
Insects_moths	<i>Lasiocampa quercus</i>	Oak Eggar	05-Jul-05	05-Jul-05
Insects_moths	<i>Macrothylacia rubi</i>	Fox Moth	22-Aug-17	22-Aug-17
Insects_Odonata	<i>Aeshna cyanea</i>	Southern Hawker	22-Aug-17	22-Aug-17
Insects_Odonata	Aeshnidae	hawker dragonfly	02-Sep-05	02-Sep-05
Insects_Odonata	<i>Sympetrum danae</i>	Black Darter	02-Sep-05	02-Sep-05
Insects_other	<i>Bombus lucorum</i> agg.	White-Tailed Bumble Bee	22-Aug-17	22-Aug-17
Insects_other	<i>Bombus pascuorum</i>	Common Carder Bee	22-Aug-17	22-Aug-17
Insects_other	<i>Cicadella viridis</i>	Insect - True Bug (Hemiptera)	22-Aug-17	22-Aug-17
Insects_other	<i>Gerris</i>	a pondskater	02-Sep-05	02-Sep-05

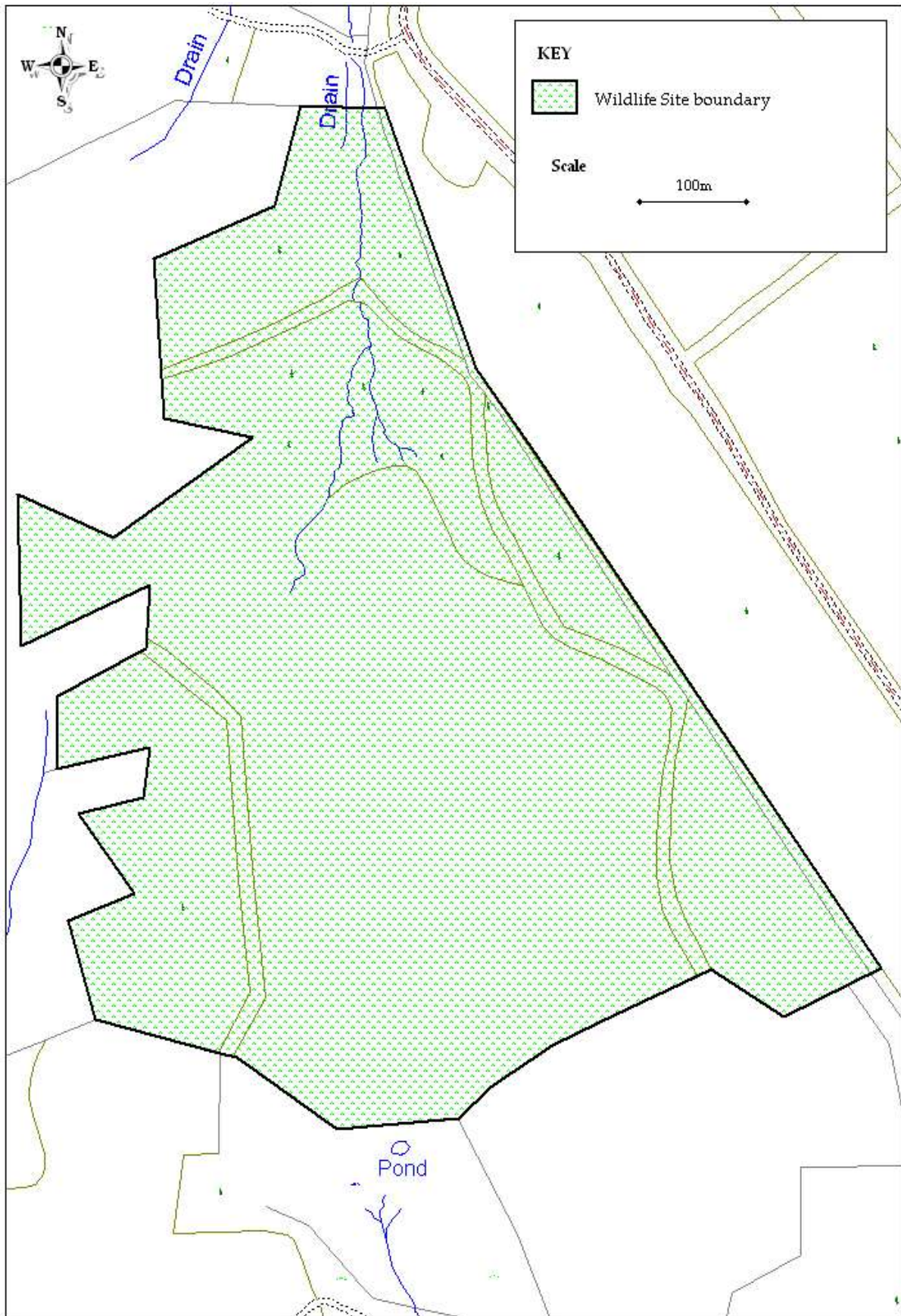
Criteria for the selection of Local Wildlife Sites in Powys

Insects_other	Helophilus pendulus	hoverfly	11-Aug-05	11-Aug-05
Insects_other	Lucilia	Greenbottle	11-Aug-05	11-Aug-05
Insects_other	Melanostoma	hoverfly	11-Aug-05	11-Aug-05
Insects_other	Myrmica	red ant	05-Jul-05	05-Jul-05
Insects_other	Sericomyia silentis	Insect - True Fly (Diptera)	04-Aug-07	22-Aug-17
Insects_other	Tachina grossa	Insect - True Fly (Diptera)	22-Aug-17	22-Aug-17
Invertebrates_other	Arion	slug	05-Jul-05	05-Jul-05
Mammals	Lepus europaeus	Brown Hare	12-Apr-05	12-Apr-05
Mammals	Sorex	shrew	12-Apr-05	19-Sep-05
Mammals	Vulpes vulpes	Fox	04-Aug-07	04-Aug-07
Plants	Agrostis canina	Velvet Bent	04-Aug-07	04-Aug-07
Plants	Agrostis canina agg	Velvet Bent	22-Aug-17	22-Aug-17
Plants	Agrostis capillaris	Common Bent	04-Aug-07	22-Aug-17
Plants	Agrostis stolonifera	Creeping Bent	04-Aug-07	04-Aug-07
Plants	Agrostis vinealis	Brown Bent	22-Aug-17	22-Aug-17
Plants	Aira praecox	Early Hair-Grass	05-Jul-05	05-Jul-05
Plants	Andromeda polifolia	Bog-Rosemary	05-Jul-05	22-Aug-17
Plants	Aulacomnium palustre	Bog Groove-Moss	04-Aug-07	04-Aug-07
Plants	Betula pubescens	Downy Birch	05-Jul-05	22-Aug-17
Plants	Blechnum spicant	Hard Fern	04-Aug-07	22-Aug-17
Plants	Calluna vulgaris	Heather	05-Jul-05	22-Aug-17
Plants	Caltha palustris	Marsh Marigold	22-Aug-17	22-Aug-17
Plants	Cardamine flexuosa	Wavy Bitter-Cress	04-Aug-07	04-Aug-07
Plants	Carex binervis	Green-Ribbed Sedge	22-Aug-17	22-Aug-17
Plants	Carex canescens	White Sedge	04-Aug-07	22-Aug-17
Plants	Carex echinata	Star Sedge	05-Jul-05	22-Aug-17
Plants	Carex nigra	Common Sedge	04-Aug-07	04-Aug-07
Plants	Carex ovalis	Oval Sedge	05-Jul-05	05-Jul-05
Plants	Carex rostrata	Bottle Sedge	04-Aug-07	22-Aug-17
Plants	Chamerion angustifolium	Rosebay Willowherb	04-Aug-07	22-Aug-17
Plants	Cirsium palustre	Marsh Thistle	04-Aug-07	22-Aug-17
Plants	Cladopodiella fluitans	Bog Notchwort	01-May-06	31-Jul-07
Plants	Deschampsia cespitosa	Tufted Hair-Grass	04-Aug-07	22-Aug-17
Plants	Deschampsia flexuosa	Wavy Hair-Grass	04-Aug-07	22-Aug-17
Plants	Drosera rotundifolia	Round-Leaved Sundew	05-Jul-05	22-Aug-17
Plants	Dryopteris carthusiana	Narrow Buckler-Fern	04-Aug-07	22-Aug-17
Plants	Dryopteris dilatata	Broad Buckler-Fern	04-Aug-07	22-Aug-17
Plants	Empetrum nigrum	Crowberry	04-Aug-07	22-Aug-17
Plants	Epilobium obscurum	Short-Fruited Willowherb	04-Aug-07	04-Aug-07
Plants	Epilobium palustre	Marsh Willowherb	04-Aug-07	22-Aug-17
Plants	Equisetum fluviatile	Water Horsetail	04-Aug-07	22-Aug-17
Plants	Erica cinerea	Bell Heather	05-Jul-05	05-Jul-05
Plants	Erica tetralix	Cross-Leaved Heath	05-Jul-05	22-Aug-17
Plants	Eriophorum angustifolium	Common Cottongrass	05-Jul-05	22-Aug-17
Plants	Eriophorum vaginatum	Hare's-Tail Cottongrass	05-Jul-05	22-Aug-17
Plants	Euphrasia officinalis agg.	Eyebright	04-Aug-07	04-Aug-07
Plants	Festuca ovina agg.	Sheep's Fescue Agg.	04-Aug-07	04-Aug-07
Plants	Festuca rubra agg.	Red Fescue	05-Jul-05	22-Aug-17
Plants	Galium palustre	Common Marsh-Bedstraw	22-Aug-17	22-Aug-17
Plants	Galium saxatile	Heath Bedstraw	04-Aug-07	22-Aug-17
Plants	Hedera helix	Common Ivy	22-Aug-17	22-Aug-17
Plants	Heracleum sphondylium	Hogweed	04-Aug-07	04-Aug-07
Plants	Holcus lanatus	Yorkshire-Fog	04-Aug-07	22-Aug-17
Plants	Holcus mollis	Creeping Soft-Grass	04-Aug-07	04-Aug-07
Plants	Hypnum jutlandicum	Heath Plait-Moss	04-Aug-07	04-Aug-07
Plants	Juncus bulbosus	Bulbous Rush	04-Aug-07	04-Aug-07
Plants	Juncus conglomeratus	Compact Rush	04-Aug-07	04-Aug-07
Plants	Juncus effusus	Soft Rush	04-Aug-07	22-Aug-17
Plants	Juncus squarrosus	Heath Rush	04-Aug-07	04-Aug-07

Criteria for the selection of Local Wildlife Sites in Powys

Plants	<i>Lolium perenne</i>	Perennial Rye-Grass	04-Aug-07	04-Aug-07
Plants	<i>Luzula multiflora</i>	Heath Wood-Rush	04-Aug-07	04-Aug-07
Plants	<i>Molinia caerulea</i>	Purple Moor-Grass	05-Jul-05	22-Aug-17
Plants	<i>Myosotis secunda</i>	Creeping Forget-Me-Not	04-Aug-07	04-Aug-07
Plants	<i>Nardus stricta</i>	Mat-Grass	22-Aug-17	22-Aug-17
Plants	<i>Narthecium ossifragum</i>	Bog Asphodel	05-Jul-05	22-Aug-17
Plants	<i>Oxalis acetosella</i>	Wood-Sorrel	01-Jun-08	01-Jun-08
Plants	<i>Pheum pratense</i>	Timothy	04-Aug-07	04-Aug-07
Plants	<i>Picea sitchensis</i>	Sitka Spruce	05-Jul-05	22-Aug-17
Plants	<i>Plantago lanceolata</i>	Ribwort Plantain	04-Aug-07	04-Aug-07
Plants	<i>Plantago major</i>	Greater Plantain	04-Aug-07	04-Aug-07
Plants	<i>Pleurozium schreberi</i>	Red-Stemmed Feather-Moss	04-Aug-07	04-Aug-07
Plants	<i>Poa annua</i>	Annual Meadow-Grass	04-Aug-07	04-Aug-07
Plants	<i>Poa pratensis</i>	Smooth Meadow-Grass	04-Aug-07	04-Aug-07
Plants	<i>Polypodium vulgare</i>	Polypody	22-Aug-17	22-Aug-17
Plants	<i>Polytrichum</i>	Moss	05-Jul-05	22-Aug-17
Plants	<i>Potamogeton polygonifolius</i>	Bog Pondweed	04-Aug-07	04-Aug-07
Plants	<i>Potentilla erecta</i>	Tormentil	04-Aug-07	22-Aug-17
Plants	<i>Pteridium aquilinum</i>	Bracken	04-Aug-07	04-Aug-07
Plants	<i>Quercus</i>	oak	22-Aug-17	22-Aug-17
Plants	<i>Quercus robur</i>	Pedunculate Oak	04-Aug-07	04-Aug-07
Plants	<i>Racomitrium lanuginosum</i>	Woolly Fringe-Moss	04-Aug-07	04-Aug-07
Plants	<i>Ranunculus flammula</i>	Lesser Spearwort	04-Aug-07	04-Aug-07
Plants	<i>Ranunculus omiophyllus</i>	Round-Leaved Crowfoot	04-Aug-07	04-Aug-07
Plants	<i>Ranunculus repens</i>	Creeping Buttercup	04-Aug-07	22-Aug-17
Plants	<i>Rhinanthus minor</i>	Yellow-Rattle	04-Aug-07	04-Aug-07
Plants	<i>Rhynchospora alba</i>	White Beak-Sedge	04-Aug-07	22-Aug-17
Plants	<i>Rhytidiadelphus loreus</i>	Little Shaggy-Moss	05-Jul-05	05-Jul-05
Plants	<i>Rhytidiadelphus squarrosus</i>	Springy Turf-Moss	04-Aug-07	04-Aug-07
Plants	<i>Rubus fruticosus</i> agg.	Bramble	04-Aug-07	22-Aug-17
Plants	<i>Rumex acetosa</i>	Common Sorrel	04-Aug-07	22-Aug-17
Plants	<i>Salix cinerea</i>	Grey Willow	04-Aug-07	22-Aug-17
Plants	<i>Scorzoneroides autumnalis</i>	Autumn Hawkbit	04-Aug-07	04-Aug-07
Plants	<i>Sorbus aucuparia</i>	Rowan	04-Aug-07	22-Aug-17
Plants	<i>Sphagnum</i>	Moss	05-Jul-05	05-Jul-05
Plants	<i>Sphagnum capillifolium</i>	Red Bog-Moss	04-Aug-07	04-Aug-07
Plants	<i>Sphagnum cuspidatum</i>	Feathery Bog-Moss	04-Aug-07	04-Aug-07
Plants	<i>Sphagnum fallax</i>	Flat-Topped Bog-Moss	04-Aug-07	04-Aug-07
Plants	<i>Sphagnum fuscum</i>	Moss	15-Nov-06	15-Nov-06
Plants	<i>Sphagnum magellanicum</i>	Magellanic Bog-Moss	01-May-06	15-Nov-06
Plants	<i>Sphagnum palustre</i>	Blunt-Leaved Bog-Moss	04-Aug-07	04-Aug-07
Plants	<i>Sphagnum papillosum</i>	Papillose Bog-Moss	04-Aug-07	04-Aug-07
Plants	<i>Sphagnum subnitens</i>	Lustrous Bog-Moss	04-Aug-07	04-Aug-07
Plants	<i>Sphagnum tenellum</i>	Soft Bog-Moss	15-Nov-06	15-Nov-06
Plants	<i>Stellaria alsine</i>	Bog Stitchwort	04-Aug-07	22-Aug-17
Plants	<i>Taraxacum officinale</i> agg.	Dandelion	04-Aug-07	04-Aug-07
Plants	<i>Trichophorum cespitosum</i>	Deergrass	22-Aug-17	22-Aug-17
Plants	<i>Trichophorum germanicum</i>	Deergrass	04-Aug-07	01-Jun-10
Plants	<i>Trifolium repens</i>	White Clover	04-Aug-07	04-Aug-07
Plants	<i>Ulex gallii</i>	Western Gorse	22-Aug-17	22-Aug-17
Plants	<i>Urtica dioica</i>	Common Nettle	04-Aug-07	22-Aug-17
Plants	<i>Vaccinium myrtillus</i>	Bilberry	05-Jul-05	22-Aug-17
Plants	<i>Vaccinium oxycoccos</i>	Cranberry	05-Jul-05	22-Aug-17
Plants	<i>Veronica arvensis</i>	Wall Speedwell	04-Aug-07	04-Aug-07
Plants	<i>Veronica scutellata</i>	Marsh Speedwell	04-Aug-07	04-Aug-07
Plants	<i>Viola palustris</i>	Marsh Violet	04-Aug-07	04-Aug-07
Spiders	<i>Araneus quadratus</i>	spider (Araneae)	22-Aug-17	22-Aug-17
Spiders	<i>Cheiracanthium erraticum</i>	spider (Clubionidae)	22-Aug-17	22-Aug-17
Spiders	Lycosidae	wolf spiders	22-Aug-17	22-Aug-17

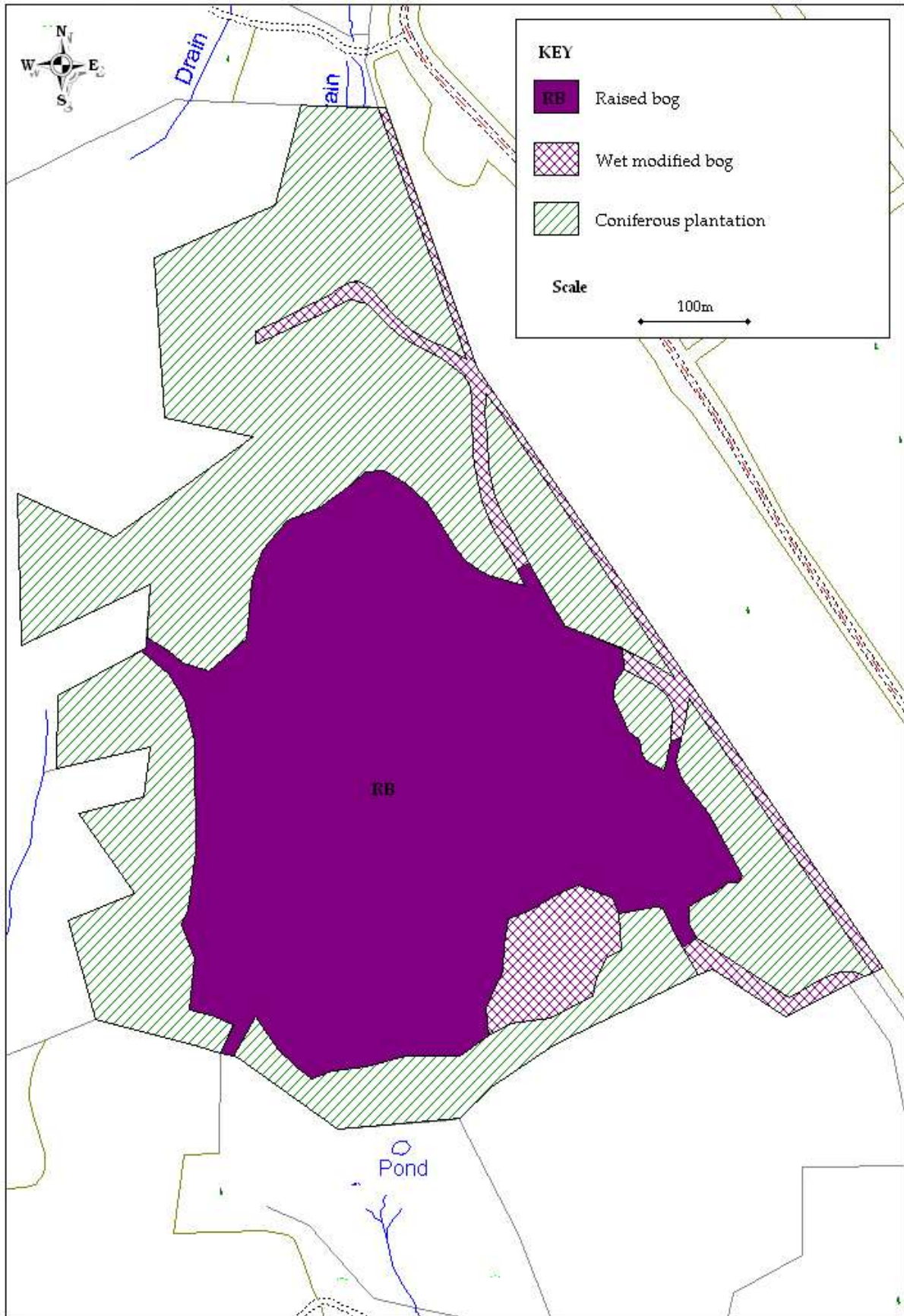
Cors Porffor boundary map



Grid reference: SN923456

Produced by: Tammy Stretton 04/08/2019

Cors Porffor habitat map



Grid reference: SN923456

Produced by Tammy Stretton: 04/08/2019