

# MONMOUTHSHIRE MEADOWS GROUP

## BIODIVERSITY REPORT

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### Introduction

The Monmouthshire Meadows Group was founded in 2003 to encourage and help owners of small fields to manage these for the benefit of plants, insects and other wildlife. New MMG members are visited and surveys made of their land and advice and training in plant identification given where appropriate. Common problems are bracken and bramble encroachment and sometimes a lack of management on some sites. Many landowners have no machinery and no stock and so an important role of the MMG is to let members know of local contractors and stock-owners. We also move MMG's own ponies around sites where no other stock can be found.

In 2011 a grant from Environment Wales enabled volunteers to visit more sites and to resurvey many sites previously visited between 2003 and 2006. This was to assess the effectiveness of any management. One drawback of a late summer visit is that many spring species such as *Luzula campestris*, *Carex caryophyllea* and *Primula veris* will not be found so the number of species and of indicator species found from August to November visits will be underestimates. Generally the more visits made to a site the greater the number of species that will be found. Sites vary from <0.5 acre to in excess of 40 acres but most are small (1-5 acres). Surveys involved a walk over and around the site, listing all plants seen. At a sample of sites especially where training sessions were organised, recording was carried in five randomly placed quadrats.

The grant also prompted the Group to input all survey data onto a spreadsheet for analysis. Many sites surveyed by MMG have met the criteria (a minimum of eight widespread indicator species for neutral and calcareous grassland, seven indicators for acid grassland and 12 indicators for marshy grassland – see LWS Guidelines for Selection) for Local Wildlife Site designation; other less diverse sites have in many instances been enhanced by the introduction of sympathetic management and in some instances by the introduction of seeds of hay rattle and other indicator species.

The data presented in this report show how widespread different species were at MMG sites as well as the abundance of species and of indicators for neutral, acid, calcareous and marshy grassland. Some sites have a mosaic of grassland types with many sites having one or more species of marshy grassland.

**N.B. This report only includes data gathered up to December 2011**



### **General Overview of the Monmouthshire Meadows Group Area**

The area covered by the group is mainly the county of Monmouthshire. This is essentially rural and lowland (below 250m) in character with the main towns being Monmouth, Abergavenny, Chepstow and Usk. The Wye Valley forms the eastern boundary, the River Monnow the north east and there is part of the Brecon Beacons National Park in the north. The River Usk flows north to south through the western part of the county. Four MMG members have land across the border into Herefordshire but the data for these sites have been excluded from the analyses in this report.

Agricultural improvement has caused the loss of the majority of semi-natural grassland in lowland Britain. Semi-natural grassland is thus a scarce and declining resource, the amount remaining in Monmouthshire is probably less than 2,000 ha (5,000 acres) (see Westwood *et al.* 1995). The least modified grassland is of great conservation value and should be conserved and enhanced by appropriate management and designation as Local Wildlife Sites (see Gwent Wildlife Trust, 2004).

## Description of MMG grasslands

The majority of the Monmouthshire Meadow Group sites are best described as semi-improved neutral grassland (i.e. grassland on neutral soils, neither acidic nor calcareous in nature, with a pH 5.5 to 7.0). Those sites with the greatest diversity of plant species and the least amount of agricultural improvement fit the grassland type *Cynosurus cristatus* – *Centaurea nigra* community (MG5 ) of the National Vegetation Classification (Rodwell 1992). Characteristic species include the finer grasses such as *Cynosurus cristatus*, *Agrostis capillaris*, *Festuca rubra* and *Anthoxanthum odoratum*. There is very little *Lolium perenne* present. Herbs can be abundant and will include *Centaurea nigra*, *Lotus corniculatus*, *Trifolium pratense* and *Lathyrus pratensis* with rarer species such as *Leontodon hispidus*, *Primula veris*, *Silva silaus*, *Orchis morio*, *Platanthera chlorantha* and *Ophioglossum vulgatum*. In hay meadows *Rhinanthus minor* and *Leucanthemum vulgare* are often abundant. This is the grassland type that most meadows owners should aspire to and the management should be tailored to help in achieving this.

With some agricultural improvement e.g. fertilizer applications, overgrazing or ploughing and reseeded (even if this has occurred many decades ago) the grassland will be less diverse. Grasses are more dominant in the sward (including some *Lolium perenne*) but other herbs will still be present for particularly *Hypochoeris radicata*, *Rumex acetosa*, *Ranunculus* species, *Plantago lanceolata* and *Trifolium repens*, along with some *Centaurea nigra*, this is the *Lolium perenne* – *Cynosurus cristatus* community, MG6.

Through neglect the grassland becomes rank with *Arrhenatherum elatius*, *Dactylis glomerata* and *Holcus lanatus* often dominant creating a tussocky sward. *Heracleum sphondylium*, *Urtica dioica* and *Cirsium* species are often conspicuous in this *Arrhenatherum elatius* community, MG1.

On wet or damp ground the more improved grassland is of the *Holcus lanatus* – *Juncus effusus* community, MG10. Here the abundant *Juncus effusus* and *Holcus lanatus* are joined by *Agrostis stolonifera* and also herbs for example *Lotus pedunculatus*.

Marshy grassland is present at some of the Monmouthshire Meadow sites. *Juncus* species are abundant with *Agrostis* species, *Anthoxanthum odoratum*, *Festuca rubra* and *Holcus lanatus* but ideally there will also be a variety of other species such as *Epilobium palustre*, *Galium palustre*, *Lotus pedunculatus*, *Mentha aquatica*, *Ranunculus flammula* and *Filipendula ulmaria* (this is the *Juncus* – *Galium palustre* community, M23). *Dactylorhiza praetermissa*, *Caltha palustris*, *Stachys palustris*, *Stellaria uliginosum* and *Lychnis flos-cuculi* may also be present. On bogs at a couple of MMG sites *Hydrocotyle vulgaris*, *Viola palustris*, *Anagallis tenella* and *Dactylorhiza maculatum ssp. ericetorum* have been found.

On slightly more acidic soils *Danthonia decumbens*, *Carex caryophyllea*, *Potentilla erecta*, *Hypericum pulchrum*, *Veronica officinalis*, *Polygala serpyllifolia*, *Pedicularis sylvatica*, *Conopodium majus* and *Succisa pratensis* may be found along with the neutral grassland characteristic species (this is the *Danthonia decumbens* sub-community, MG5c). On base-poor soils in fields usually managed as pasture there a more distinctly acid grassland community is found (the *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* community, U4). This is usually a short sward with mosses amongst the fine grasses and *Galium saxatile*, *Luzula campestris* and *Potentilla erecta*. A few MMG fields overlying quartz

conglomerate still show their heathland origins, having *Calluna vulgaris*, *Erica cinerea* and *Deschampsia flexuosa* at the edges

Some of the neutral grassland has a calcareous element to it with species such as *Trisetum flavescens*, *Galium verum*, *Pimpinella saxifraga*, *Sanguisorba minor* and *Agrimonia eupatoria*. This is the *Galium verum* sub-community of MG5 (MG5b). One of the other calcareous grassland types that may be present is the *Bromopsis erecta* community (CG3) which is very rare in the south east of Monmouthshire. Characteristic species include *Blackstonia perfoliata*, *Centaureum erythraea*, *Crepis capillaris* and *Linum catharticum*. On the base rich Old Red Sandstone rocks to the north of the County there are remnants of *Festuca ovina*, *Agrostis capillaris* – *Thymus polytrichus* grassland (CG10) with a range of neutral, acid and calcareous species, of note being *Galium saxatile*, *Lotus corniculatus*, *Potentilla erecta*, *Carex caryophylla*, *Carlina vulgaris*, *Pilosella officinarum* and *Leontodon autumnalis*.

### **The flora of MMG meadows and pastures**

In all, data were available for 120 sites within Monmouthshire VC 35. Three further sites were excluded from this analysis as were over the country border in Herefordshire. A further three Monmouthshire sites surveyed in the winter of 2011/2012 were also excluded. More than 280 species were recorded on the 120 sites although a few of these were ruderal/arable species such as *Sonchus oleraceus* and some were more typically hedgerow or woodland species such as *Geum urbanum*, *Geranium robertianum*, *Arum maculatum*, *Alliaria petiolata* and *Stachys sylvatica*. Over 60 species of grasses, sedges and rushes were reported and approximately 200 were grassland or wetland species.

It must be remembered that only one visit was made to some sites and therefore depending on whether the visit was in the spring or summer, other later-flowering or earlier flowering species will have been overlooked. The following figures are therefore minima.

## Most widespread species

The seven most widespread and abundant grassland species, occurring at over 90% of sites are shown in Table 1 in order of frequency of occurrence as too are other widespread species (occurring in more than 70% of sites), in 50% to 70% of sites and in 40% to 50% of sites and less widespread species in 25% to 40% of sites.

Table 1. Frequency of occurrence of commoner plant species at MMG sites. (Species in bold are 'indicator species' of neutral, calcareous, acidic or marshy grassland – see Gwent Wildlife Trust (2004).

Most widespread species; in >90% sites	Widespread species in >70% of sites	Species in 50-70% of sites	Species in 25-40% of sites
<i>Holcus lanatus</i>	<i>Festuca rubra</i>	<i>Poa trivialis</i>	<i>Senecio jacobaea</i>
<i>Ranunculus repens</i>	<i>Cerastium fontanum</i>	<i>Scilla non-scripta</i>	<i>Trifolium dubium</i>
<i>Ranunculus acris</i>	<i>Heracleum sphondylium</i>	<b><i>Luzula campestris</i></b>	<b><i>Viola riviniana</i></b>
<i>Anthoxanthum odoratum</i>	<b><i>Lotus corniculatus</i></b>	<b><i>Cardamine pratensis</i></b>	<i>Crepis capillaris</i>
<i>Dactylis glomerata</i>	<b><i>Trifolium pratense</i></b>	<b><i>Lathyrus pratensis</i></b>	<b><i>Dactylorhiza fuchsia</i></b>
<i>Plantago lanceolata</i>	<i>Achillea millefolium</i>		<i>Angelica sylvestris</i>
<i>Rumex acetosa</i>	<i>Agrostis capillaries</i>	<b>Species in 40% -50% sites</b>	<b><i>Potentilla erecta</i></b>
	<b><i>Stellaria graminea</i></b>	<i>Leucanthemum vulgare</i>	<b><i>Ranunculus bulbosus</i></b>
	<b><i>Hypochaeris radicata</i></b>	<i>Conopodium majus</i>	<b><i>Potentilla sterilis</i></b>
	<i>Taraxacum officinale</i>	<b><i>Ajuga reptans</i></b>	<i>Alopecurus pratensis</i>
	<i>Veronica chamaedrys</i>	<b><i>Primula veris</i></b>	<i>Phleum pratense</i>
	<b><i>Centaurea nigra</i></b>	<b><i>Lotus pedunculatus</i></b>	<b><i>Rhinanthus minor</i></b>
	<i>Cynosurus cristatus</i>		<b><i>Hypericum maculatum</i></b>

**Scarcer species:** All other key species were present at fewer than 25% of sites.



Table 2. Scarcer species on MMG sites

Species at 10-30 sites	In 3-9 sites	At 1-3 sites
<b>Leontodon hispidus 30</b>		
<i>Bromus hordeaceus</i> or <i>B.commutatus</i> 29	<b>Galium saxatile 9</b>	<b>Dactylorhiza praetermissa 3</b>
<b>Filipendula ulmaria 28</b>	<b>Pedicularis sylvatica</b>	<b>Polygala serpyllifolia</b>
<b>Vicia cracca 25</b>	<b>Trifolium medium 8</b>	<b>Ononis repens</b>
<i>Vicia sativa</i> 25	<b>Orchis mascula</b>	<b>Viola palustris</b>
<b>Galium palustre 23</b>	<b>Pilosella officinarum 7</b>	<b>Anacamptis pyramidalis</b>
<i>Lysimachia nemorum</i> 22	<b>Alchemilla filicaulis</b>	<b>Danthonia decumbens</b>
<b>Hypericum perforatum 22</b>	<b>Campanula rotundifolia</b>	<b>Platanthera chlorantha 2</b>
<i>Vicia sepium</i> 20	<b>Clinopodium vulgare</b>	<b>Lysimachia nummularia</b>
<i>Rumex crispus</i> 20	<i>Festuca pratensis</i>	<b>Hydrocotyle vulgaris (2),</b>
<b>Centaurium erythraea 19</b>	<i>Vicia hirsuta</i>	<b>Silaum silaus</b>
<b>Carex flacca 19</b>	<b>Briza media</b>	<b>Sanguisorba minor</b>
<b>Lychnis flos-cuculi 17</b>	<b>Orchis (Anacamptis) morio</b>	<i>Tanacetum vulgare</i>
<b>Carex caryophylllea 16</b>	<b>Pulicaria dysenterica</b>	<i>Verbena officinalis</i>
<i>Rumex acetosella</i> 14	<b>Agrimonoia eupatoria</b>	<b>Stachys palustris</b>
<b>Narcissus pseudonarcissus 14</b>	<b>Luzula multiflora 6</b>	<b>Calluna vulgaris</b>
<b>Polygala vulgaris 13</b>	<b>Succisa pratensis</b>	<b>Helicotricon pubescens 1</b>
<i>Malva moschata</i> 11	<b>Leontodon saxatilis</b>	<i>Vicia tetrasperma</i>
<b>Stellaria uliginosum 11</b>	<i>Leontodon autumnalis</i>	<i>Trifolium campestre</i>
<i>Medicago lupulina</i> 11	<b>Listera ovata</b>	<b>Sanguisorba officinalis</b>
<b>Stachys officinalis 11</b>	<b>Valeriana officinalis</b>	<i>Montia fontanum</i>
<b>Pimpinella saxifraga 11</b>	<b>Dactylorhiza maculatum</b>	<b>Genista tinctoria</b>
<b>Veronica officinalis 10</b>	<i>Teucrium scorodonia</i>	<b>Anagallis tenella</b>
	<b>Lathyrus linnifolius 5</b>	<i>Odontites verna</i>
	<b>Hypericum pulchrum</b>	<b>Linum catharticum</b>
	<b>Colchicum autumnale</b>	<b>Sison amomum</b>
	<b>Trisetum flavescens</b>	<b>Galium verum</b>
	<b>Euphrasia agg.</b>	<b>Ophrys apifera</b>
	<b>Knautia arvensis 4</b>	<b>Erica cinerea</b>
	<b>Polygonum bistorta</b>	



Sedges and grasses were possibly the least well recorded species. Some observers found identification of these plants difficult and surveys in early spring or late summer/autumn will have overlooked species flowering at other times. *Poa humilis* and both *Carex pilulifera* and *Carex divulsa* were each only found at one site but undoubtedly occur at others. *Carex nigra* was found on only two sites, *Carex ovalis* on five and *Carex hirta* on seven. *Scirpus setaceus* and *Eleocharis palustris* both were found at two wetland sites.

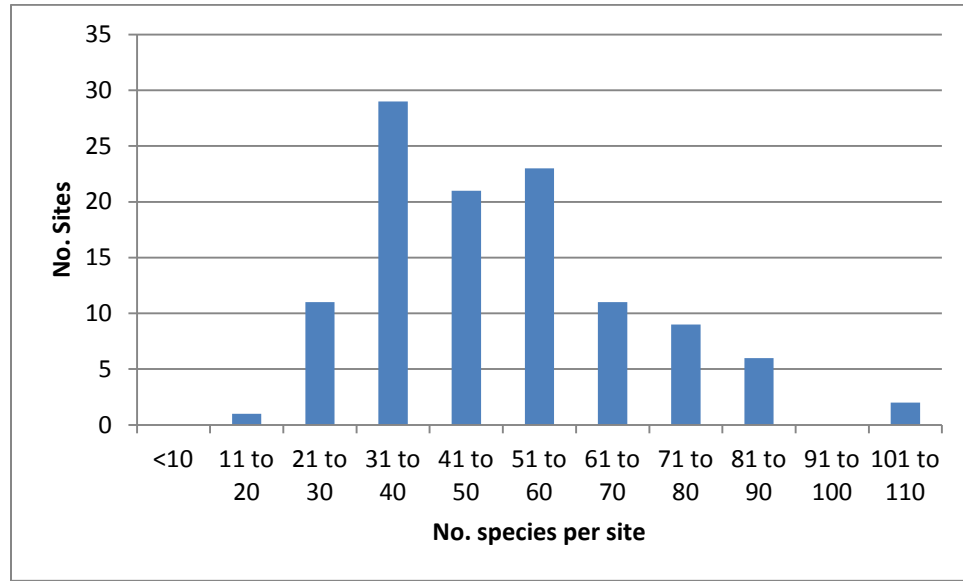
Of the less desirable species (*Lolium perenne*, nettles, thistles and docks), *Lolium perenne* occurred on about 52% of sites (62), *Rumex obtusifolius* occurred at 75% of sites (88); *Cirsium arvense* occurred on 57% of sites (69) and both *Cirsium palustre* (54) and *Cirsium vulgare* (50) on <50%. Other docks such as *Rumex conglomeratus* and *Rumex crispus* were much scarcer than *Rumex obtusifolius*, being recorded on two and 20 sites respectively. *Urtica dioica* occurred on at least 73 sites (61%) and *Trifolium repens*, often thought to result from agricultural improvement, at 87 sites (73%). Bracken *Pteridium aquilinum* was very widespread especially in hedges and at edges of fields and few sites were without this invasive fern.

### **Species diversity**

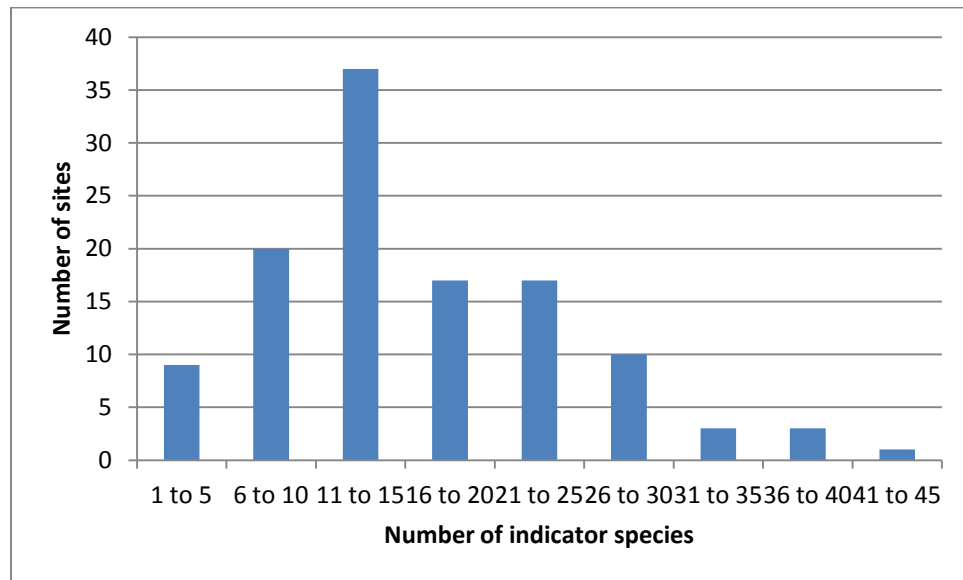
Most sites had between 31 and 60 species with a few exceptional sites having 103 and 104 species (Figure 1). Undoubtedly further visits to most sites would increase their species lists. Although large sites might be thought to hold more species than small sites, many small sites (<2 acres) held as many species as sites of >10 acres.

When the number of 'indicator species' is considered, the majority of sites held more than 10 indicators (neutral, acid, calcareous and marshy grassland indicators combined) with seven sites with between 31 and 41 species (Figure 2). Just eleven sites had fewer than five species. These sites were mainly agriculturally improved fields. Sites with the greatest numbers of indicators generally contained areas of wetland – flushes, boggy patches, stream-sides or ponds – which increased the diversity.

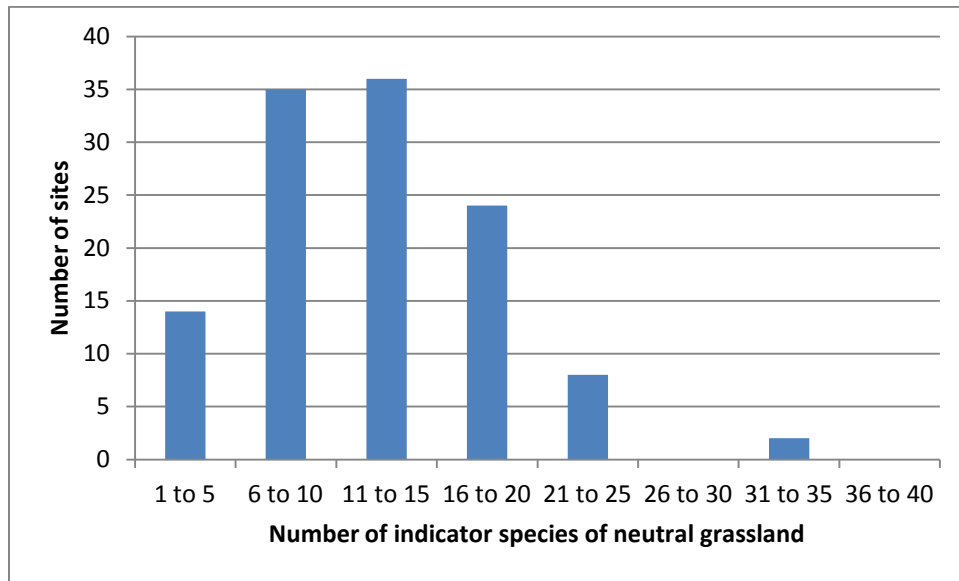
**Figure 1. Species diversity at MMG sites**



**Figure 2. The frequency of occurrence of all 'Indicator species' at MMG sites**



**Figure 3. The frequency of occurrence of neutral grassland indicator species at MMG sites**



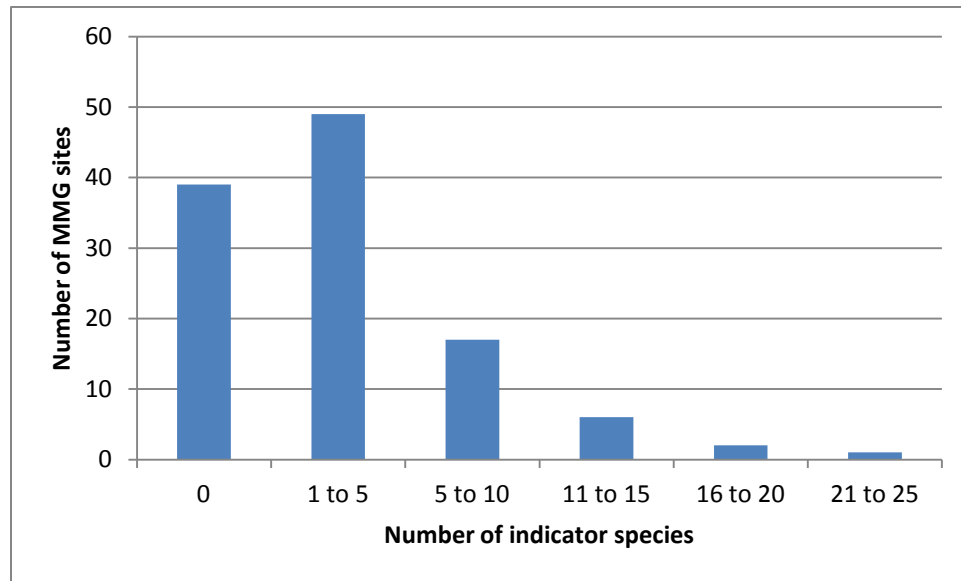
To qualify as a Local Wildlife Site (LWS) any pasture or meadow must contain eight or more indicators of neutral or calcareous grassland, seven or more indicators for acid grassland or 12 or more indicators of marshy grassland. The indicators must be widespread and frequent within the site. Of the 120 MMG sites 72 have been designated as, or put forward as candidates, for LWS status. From this analysis a number of other sites have been shown to meet the criteria for LWS.

When indicators of neutral grassland often with some acidic and calcareous elements were considered most sites held between six and 15 indicators; two exceptional sites held 36 and 38 indicators. One anomaly was *Potentilla sterilis*. This plant is given in the Guidelines as an indicator of calcareous grassland but in this study it was frequently found on MG5 neutral grassland sites.

Marshy grassland indicators were widespread at MMG sites even in some well-drained pastures. Many sites had streams or flushes supporting indicators such as *Stellaria uliginosum*, *Galium palustre*, *Lycopus europaeus*, *Stachys palustris*, *Valeriana officinalis* and *Filipendula ulmaria*. Whilst 39 sites had no such indicators, 52 sites had one to five wetland indicators (Figure 4). The most frequent of these were *Angelica sylvestris* (39 sites), *Lotus pedunculatus* (46) and *Lysimachia nemorum* (22).

Nine MMG sites had 12 or more marshy grassland indicator species and so qualify as wildlife sites regardless of other indicators. However, three of these were only eligible as LWSs because they had ponds or small lakes. Two sites of the remaining six sites were true acid bogs with *Hydrocotyle vulgaris*, *Viola palustris*, *Anagallis tenella* and/or *Dactylorhiza maculatum ssp. ericetorum*. Three other sites along the River Wye could be described as floodplain grasslands with typical species being *Geranium pratense* and *Rorippa sylvestris*.

**Figure 4. The frequency of occurrence at MMG sites of marshy grassland indicators**



### Effects of management advice

Over 60 sites have been revisited to check on management. Most sites have been well managed and are in a satisfactory or improved condition. The grassland flora is still diverse or has improved with for example, less *Dactylis glomerata* clumps in some and in several cases, much less Bramble. Only three of the sites have unfavourable management at present. At one site part of the meadow is mown too frequently and a wet area of interest has unfortunately been in-filled with rubble. A second site that was fenced to allow grazing has had insufficient grazing and has become rank (*Arrhenatherum elatius* dominated in parts) with Bracken and Brambles gaining ground. At a third site heavy grazing pressure by sheep does not permit any plants to flower.

MMG has been active in persuading owners to allow hay-cutting or grazing; in some instances the Group has mown members' fields and it frequently carries out bramble-cutting for members. The two MMG Exmoor Ponies have grazed at 13 sites and ponies obtained through PONT have grazed at a further four sites.

One concern is that some members buy seed from outside sources to enhance diversity on their field or garden. Such seed sometimes contains species that would not normally be found in MG5 grassland such as the calcicoles *Plantago media* and *Daucus carota* and some other sources sell seed that is of European origin. MMG will encourage members to buy local seed collected by Gwent Wildlife Trust and MMG with their jointly-owned seed harvester or from reputable sources such as Plant Wild in Leominster that collect seed of local provenance, some from MMG meadows.

## **Conclusion**

Many MMG members own important areas of species-rich grassland and through managing them well are contributing to Monmouthshire County Council's Grassland Habitat Action Plan (HAP). Other members are creating or restoring areas of such grassland, again contributing to the HAP. MMG has also found some important threatened species such as *Orchis morio* and *Platanthera chlorantha*, at sites where they had not previously been recorded. Our data are fed through to South East Wales Biological Records Centre in Cardiff and to the Botanical Society for the British Isles through MapMate.

In the future MMG will continue to survey members' fields, orchards and/or gardens and provide advice and practical help if needed. The Gwent Wildlife Trust will be given details of those sites that meet the criteria for Local Wildlife Sites. As many sites as possible will be re-surveyed at a different time of year to that when first surveyed so that we can find species missed in the initial survey. A re-visit will be made after four to five years to a sample of sites to assess the effects of management. A map of the location of MMG sites will be made; this could enable the Group to target areas with few members to encourage landowners to join or to make them aware of the group.

There is a healthy core of loyal MMG members who are managing well a significant area of species-rich grassland.

## **Acknowledgements**

We thank MMG members for permitting access to their fields and gardens and we also thank those members who provided additional information on plants on their own land. Trevor Evans, Caroline Howard, Dave Green, Maggie Biss and Glynis Laws have all helped with survey work and the Gwent Wildlife Trust also provided some additional information for some sites. We are very grateful to Kate Marsh for translating this report into Welsh.

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