

# Open Mosaic Habitat Survey Handbook

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## **1 Introduction**

Open Mosaic Habitats on Previously Developed Land (OMH) are found mainly in urban and formerly industrial areas and have high biodiversity value. This value includes rare plants, mosses, lichens and a large number of rare invertebrates, especially bees, wasps and beetles. Between 12% and 15% of all nationally-rare and nationally-scarce insects are recorded from OMH sites including 30 UK Biodiversity Action Plan (BAP) invertebrate species. Another key feature of OMH are the unusual groups of plants that may also be present; combinations which are often unique to OMH and currently little studied.

Because of the biodiversity importance of OMH, the habitat was identified as a UK BAP Priority Habitat in 2007. Such sites are threatened by redevelopment (due to their common status as brownfield sites), inappropriate 'restoration', inappropriate management or natural succession. There is very little knowledge of the distribution of OMH, as there are no data that identify OMH sites at a national level.

In response to the lack of information about the distribution of OMH Defra commissioned a project, undertaken in two stages (Riding *et al.*, 2010; Lush *et al.*, 2013), to develop methods for identifying OMH. Outputs from the second phase of the project were methodologies for:

- the remote identification of OMH using third party data and aerial photography (Lush, 2012), which can be used to identify potential OMH sites;
- the following field survey methodology, which can be used to confirm the presence of OMH.

The method has been designed to be rapid and readily used by surveyors without extensive ecological training. The long-term objective of the survey is to identify OMH sites to determine the national extent and distribution. This will help the BAP and planning policies to be properly enforced, determining where brownfield sites are and are not OMH and suggesting where further survey is required.

## **2 Survey preparations**

### **2.1 Selecting survey sites**

It is likely that this methodology will be used in response to proposed changes to potential OMH sites, such as redevelopment of brownfield sites, re-greening or restoration of quarries, etc. In these instances the survey site will have been pre-determined.

It is likely that other surveys will be undertaken by other interested parties, such as local authorities, local records centres, wildlife trusts and volunteers. In these instances the survey sites may not have been pre-determined.

Potential OMH survey sites can be identified in a number of ways:

- using the remote identification guidelines detailed in Lush (2012)
- review of the most up to date inventory of potential OMH sites for England or Wales
- searching the map on the OMH survey website (Section 5)

## 2.2 *Landowner permission*

If you do not own or manage the site to be surveyed it is important that you have clear permission to survey it. The landowner must have consented to the survey data being incorporated into the survey database. They must be fully informed of the future use of and access to the data collected.

Once permission has been obtained, it is also useful to discuss any particular health and safety issues. This will help identify visible risks, such as cliffs and unstable surfaces, but will also protect against invisible risks, such as soil contamination and concealed culverts or shafts.

## 2.3 *Use of aerial photography and satellite imagery*

It is by no means necessary to have access to aerial photography or satellite imagery to undertake the survey. If such imagery is available it can be useful for the following:

- Identifying features of interest that should be sought during the survey.
- Measuring and mapping areas of open and closed habitat.
- Mapping areas of deposited material, which can act as a baseline against which the addition of other material can be assessed.
- Mapping habitat type and management stand boundaries. Whilst it is usually not possible to determine the exact habitat type from aerial photographs alone, aerial imagery can be used following the survey to identify boundaries observed during the survey.

Organisations using this survey methodology may have access to high resolution aerial photography, along with dedicated GIS software, and may wish to keep records of the points listed above. Most surveyors will not have access to commercial aerial photography. Nevertheless, there are now a number of online sources of aerial photography that, whilst often not the same quality as those available commercially, could be beneficial when planning the survey.

## 2.4 *Equipment list*

This survey has been designed to require no specialist survey equipment. Nevertheless, there are some items that should be considered essential for practical or health and safety purposes. Other items are optional, as they are not required for the survey, but using them may have additional benefits.

### Essential

- clipboard
- survey forms and pencil/pen
- waterproof jacket and over-trousers
- appropriate personal protective equipment i.e. hi-visibility jacket, hard hat
- warm clothing if working in cold weather
- stout footwear e.g. walking boots
- compass
- large plastic bags (for the protection of survey forms and maps in wet weather)
- first aid kit and any medication if necessary
- whistle
- insect repellent and sun protection, if needed
- mobile phone, in case of emergency

- road atlas or OS maps if you do not know the location of the site well

#### Optional

- personal attack alarm
- walking poles for use on steep slopes
- GPS
- camera
- paper maps – see Section 3.1

## *2.5 Health and Safety*

The safety and wellbeing of OMH surveyors is paramount. OMH sites can be dangerous places. A full generic Health and Safety and risk assessment can be found in Appendix C. It is recommended that an assessment is made of each site surveyed to identify the risks, including those not occurring on the generic risk assessment, so that potential hazards can be avoided. This can include talking to the landowners or other parties with knowledge of the site to identify specific hazards.

Health and safety issues of particular concern whilst surveying OMH include:

- quarries, mines and cliff faces – such sites may still be active or have unstable surfaces, particularly after frosty weather;
- culverts, shafts or collapsed drains;
- fly tipping – waste may include hazardous materials, such as asbestos, metal, glass, sharps, chemicals and medical wastes;
- steep slopes – may be loose and unstable, and may become very slippery and dangerous in wet weather;
- insects – OMH sites can harbour biting insects, especially where wet areas are present;
- water bodies – in OMH sites these can contain high levels of a wide range of contaminants;
- animals – encounters with rats, dogs, farm animals and wild animals may occur;
- people – in urban areas, especially inner city areas, encounters with members of the public are likely.

Specific mitigation may reduce the risks present on some sites. OMH sites, or parts of sites, should be avoided if they are thought likely to be unacceptably hazardous.

It is worth checking the weather forecast before the survey, as rain, strong winds and thunder storms can all increase the risks associated with OMH survey. Consider postponing the survey until the weather has improved if the forecast is poor.

It is extremely important for each surveyor to let someone know where they will be going and when they return, so that the alarm can be raised if the surveyor does not return from the survey. If the site has significant safety concerns then it is sensible to phone the contact more frequently than usual.

### **3 General survey methodology**

#### *3.1 Using maps for future reference*

Whilst the survey has no need for maps, it may provide additional benefits for the site owners and managers or conservation bodies. This depends upon personal or corporate objectives and why the survey is being undertaken.

Maps may be useful for the following:

- recording and mapping additional habitat or stand boundaries
- recording particular hazards for future reference
- providing a record of features of particular interest that otherwise would not be recorded; this could include mapping the locations of:
  - management compartments
  - changes in the substrate, such as localised spoil heaps
  - rare species
  - historic features
  - entry points and access paths
  - site furniture, such as gates, styles, benches, etc.

#### *3.2 Impacts on legally protected species*

An OMH site may be designated as a Site of Special Scientific Interest, Local Nature Reserve, Local Wildlife Site or another local or national designation. It is also important to note that an OMH site may also be indirectly protected where it provides a habitat for a legally protected species under the Wildlife and Countryside Act 1981 (the Act), or the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations). Where OMH surveys are being undertaken it is very important not to disturb such species unless you have been granted a licence to do so.

It is an offence under Section 1 of the Act to intentionally kill, injure or take any wild bird or to take, damage or destroy its nest or eggs. Certain wild birds are afforded additional protection under the Act, which makes it an offence to disturb them at the nest. As a general rule surveyors should avoid any disturbance to all birds.

Section 9 of the Act has similar protection for some animals. It is an offence to intentionally or recklessly kill, injure or take any wild animal included in Schedule 5 of the Act or damage, destroy any structure or place it uses for shelter or protection, or disturb any such animal while it is occupying such a place. Furthermore, regulation 41 of the Habitats Regulations make it an offence to deliberately capture, injure or kill, disturb or harm the European protected species of animals which are listed in Schedule 2 of the Regulations or damage or destroy a breeding site or resting place of such an animal.

Certain plants have some legal protection under the Act, in that no person may uproot any wild plant without the owner's consent. Some plants are afforded additional protection under Schedule 8 of the Act, which makes it an offence to pick, uproot, sell or destroy any of these plants. The Habitats Regulations offer similar protection to European protected species of plants which are listed in Schedule 5 of the Regulations. It should not be necessary to pick, uproot, destroy or intentionally damage any plants whilst undertaking this survey.

Some general guidelines that should be adhered to are:



- Do not touch, harass or otherwise disturb any protected species.
- Do not interfere with bat, bird or dormouse boxes or any other resting place or breeding site for any protected species.
- Do not pick, destroy or uproot any protected plant or its seeds or spores; nor uproot any other wild plant if you are not authorised to do so.
- Avoid surveying the OMH site during periods where disturbance would have a detrimental effect on protected species known to be present on the site, such as during hibernation and breeding seasons.
- Follow any guidance specific to the OMH site and the Defra regulatory guidance on disturbance to resting places and breeding sites.

*Legally protected species likely to be found in OMH sites include the following:*

- badgers *Meles meles*
- dormice *Muscardinus avellanarius*
- all bats
- great crested newts *Triturus cristatus*
- all birds
- all reptiles (e.g. Figure 3.1)
- fairy shrimp *Chirocephalus diaphanous*
- tadpole shrimp *Triops cancriformis*
- certain plants, including:
  - Deptford pink *Dianthus armeria*
  - Young's helleborine *Epipactis youngiana*
  - meadow clary *Salvia pratensis*



Figure 3.1 – Young grass snake *Natrix natrix*.  
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## 4 The survey form

The survey form (Appendix A) is split into five parts:

- General information (see Section 4.1)
- Site description (see Section 4.2)
- Vegetation (see Section 4.3)
- Optional information (see Section 4.4)
- Plant species recording – optional (see Section 4.5)

### 4.1 General information

The first part of the survey form is used to record details about the context of the site, such as how it formed and the surrounding habitats. It also records the general survey details.

#### 4.1.1 Basic survey details

|  |   |  |  |
|--|---|--|--|
| Q1 Site name: <input type="text"/>   |   | Q2 OS grid reference: <input type="text"/>   |  |
| Q3 Site ID: <input type="text"/>   | Q4 Date: <input type="text"/>                   | Q5 Is a site map available? Yes <input type="checkbox"/> No <input type="checkbox"/> |  |
| Q6 Surveyor: <input type="text"/>  |   | Q7 Time on site (hours): <input type="text"/>  |  |
| Q8 I confirm that I have reviewed the site against the generic risk assessment for OMH survey and identified any additional risks. |   |  |  |
| Initial: <input type="text"/>  | Note any additional risks: <input type="text"/> |  |  |

Questions 1 to 8 are where all the basic information about the survey should be recorded, including the site name, OS grid reference, surveyor name and date of the survey.

The Ordnance Survey (OS) grid reference should be a six-figure (100 m) grid reference for the centre of the site in the format AA000000, e.g. SO154338. For guidance on identifying OS grid references please see Ordnance Survey's sheet entitled 'Using the National Grid', which is available from <http://www.ordnancesurvey.co.uk/oswebsite/gi/nationalgrid/nationalgrid.pdf>.

Each polygon in the inventory has a unique site ID number, so this information will be available before the survey commences if the site is taken from the inventory or website. The number should be entered into the box for question 3. If the site is not yet in the inventory then the box can be left blank.

Dates should be recorded in the form DD/MM/YYYY, e.g. 16/02/2011. If the survey is conducted over more than one day then a single day should be chosen from the middle of the survey period. There is also a box for recording the time spent on site conducting the survey, to assist with future survey planning.

The survey can be conducted without a site map. Nevertheless, there are a number of reasons why you may find it valuable to record information on a map of the site (see also Section 3.1):

- To record additional habitat or stand boundaries.
- To record management compartments or historic features, which may assist with future management decisions.
- To assist with repeat surveys, by identifying hazards, recording access or features of note that can be monitored in the future.

If a map is available this can be indicated by ticking the appropriate box.

Before the survey commences the site should be assessed against the generic risk assessment for OMH survey (Appendix A) and any additional risks recorded.

#### 4.1.2 Survey access

|  |  |  |   |
|--|--|--|---|
| <b>Q9 Which best describes the survey access to the site? Tick all that apply.</b> |  |  |   |
| <input type="checkbox"/> Full access to the whole site                             | <input type="checkbox"/> From public right of way  | <input type="checkbox"/> Viewed from site boundary | <input type="checkbox"/> Viewed from a distance |
| <input type="checkbox"/> Full access to part of the site                           | <input type="checkbox"/> Other ( <i>describe</i> ) |  |   |

Tick the box that best describes the level of access available for the survey. Note that the following logical rules apply:

1. 'Full access to the whole site' is mutually exclusive with all the other options
2. 'Full access to part of the site' can be ticked in combination with other options except 'Full access to the whole site'

Judgement should be used to determine whether 'Other (*describe*)' should be ticked with other options.

#### 4.1.3 Site origins

|   |  |   |
|---|--|---|
| <b>Q10 Which of the following describe the site? Tick all that apply.</b> |  |   |
| <input type="checkbox"/> Known history of disturbance                     | <input type="checkbox"/> Severely modified by previous use | <input type="checkbox"/> Extraneous materials or substrates added |
| <input type="checkbox"/> No history of disturbance or past use            | <input type="checkbox"/> Other ( <i>describe</i> )         |   |

In order to qualify as OMH, a site must have a history of past use, either through development, industrial use, waste disposal, mineral extraction or substantial disturbance of the soil or substrate. Tick the options that best describe the origin of the site or use 'Other' to provide an additional description of the past use of the site.

If the site has not been substantially changed by past use then it is possible that it does not qualify as OMH and 'No history of disturbance or past use' should be ticked.

#### 4.1.4 Age of the habitat

|  |  |   |                                  |
|--|--|---|----------------------------------|
| <b>Q11 How old is the site?</b> <i>The number of years that the overall habitat has had to develop should be estimated if this is not known. Tick one.</i> | <input type="checkbox"/> Less than 5 years | <input type="checkbox"/> 10 to 19 years   | <input type="checkbox"/> Unknown |
|  | <input type="checkbox"/> 5 to 9 years      | <input type="checkbox"/> 20 years or more |                                  |

Knowing the age of an OMH site is useful for interpreting the survey data to determine the likely longevity and habitat continuity. Young sites may not have developed a full OMH community, which may indicate that existing interest could improve as more species become established. Well established sites that still contain early successional habitats are likely to have underlying conditions that are preventing succession and often have more robust plant and invertebrate communities.

The overall age of the site can be estimated if it is not already known. This should take into account evidence of the previous use of the site and the likely time taken for artificial structures and substrates to decay and gain plant cover. For example, the assessment might consider how broken up an area of tarmac is, the amount of plant growth that has developed over concrete or the number of plants (and plant species) in a spoil heap.

Some sites contain habitats of different ages, which add diversity, form part of the mosaic and act as reservoirs of species in the development of the communities on the rest of the site. Older habitat patches that occur within a generally younger site should be recorded as a target note (See Section 4.4.1).

#### 4.1.5 Surrounding landscape

| <b>Q12 What other habitats and land use are within the surrounding landscape?</b> <i>Please check aerial photography and other information sources, in addition to investigating the surrounding area during the site visit. Tick one box for each habitat or land use.</i> |                          |                          |                          |                     |                          |                          |                          |  |  |
|---|--------------------------|--------------------------|--------------------------|---------------------|--------------------------|--------------------------|--------------------------|--|--|
|   | Adjacent                 | Within 2 km              | Within 10 km             |                     | Adjacent                 | Within 2 km              | Within 10 km             |  |  |
| Brownfield  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Hedgerows           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |  |
| Unimproved grassland  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Ditches             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |  |
| Improved grassland  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Quarry              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |  |
| Arable farmland   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Railway             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |  |
| Wetland   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Industry or housing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |  |
| Heath or moorland   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Other (describe)    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |  |
| Scrub   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |                          |                          |                          |  |  |
| Woodland  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |                          |                          |                          |  |  |
| Coastal habitats  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |                          |                          |                          |  |  |

Other habitat areas within the landscape surrounding OMH sites act as species reservoirs, from which species can colonise the site. Together with the survey site, these habitats can support meta-populations of species, where individuals are able to move between different sites.

Other habitats in the surrounding area can also contain important resources for mobile species, such as additional nectar sources.

The natural resources within the surrounding area are particularly important for small OMH sites. Larger sites may be able to support populations of species, but smaller sites will often require a network of habitat area nearby to provide sufficient habitat overall to support some species.

Each habitat and land use type present within a 10 km radius of the site should be recorded. It is only necessary to record the closest habitat patch, so if a habitat occurs adjacent to the site there is no need to also tick the 'Within 2 km' and 'Within 10 km' boxes.

## 4.2 Site description

The site description section of the form records details of the terrain and ground conditions, as well as any activities that take occur on the site.

### 4.2.1 Aspect and topography

|  |   |                                      |                                       |                                       |  |                                      |
|--|---|--------------------------------------|---------------------------------------|---------------------------------------|--|--------------------------------------|
| <b>Q13 What is the overall aspect of the site? Tick one.</b>             |   |                                      |                                       |                                       |  |                                      |
| <input type="checkbox"/> South facing                                    | <input type="checkbox"/> North facing     | <input type="checkbox"/> East facing | <input type="checkbox"/> West facing  | <input type="checkbox"/> Level        | <input type="checkbox"/> None dominant |                                      |
| <b>Q14 What is the topography of the site like? Tick all that apply.</b> |   |                                      |                                       |                                       |  |                                      |
| <input type="checkbox"/> Flat ground                                     | <input type="checkbox"/> Slopes and banks |                                      | <input type="checkbox"/> South facing | <input type="checkbox"/> North facing | <input type="checkbox"/> East facing   | <input type="checkbox"/> West facing |
| <input type="checkbox"/> Hollows   | <input type="checkbox"/> Cliffs           |                                      | <input type="checkbox"/>              | <input type="checkbox"/>              | <input type="checkbox"/>               | <input type="checkbox"/>             |
| <input type="checkbox"/> Mounds  |   |                                      | <input type="checkbox"/>              | <input type="checkbox"/>              | <input type="checkbox"/>               | <input type="checkbox"/>             |

The aspect and topography of the site affects both the plant and invertebrate communities that can develop. South facing slopes often have sparser, more drought tolerant vegetation and can support a wide range of thermophilic invertebrates (see Glossary of terms), including many species rare in the UK. North facing slopes often have damper, more luxuriant vegetation and support different invertebrate communities.

The direction of slopes can relate to the site as a whole (its overall aspect) or to parts of the site (its topography). So a site may be level overall, but contain hollows, mounds, cliffs and slopes facing in a range of directions, all of which will add to the potential biodiversity of the site.

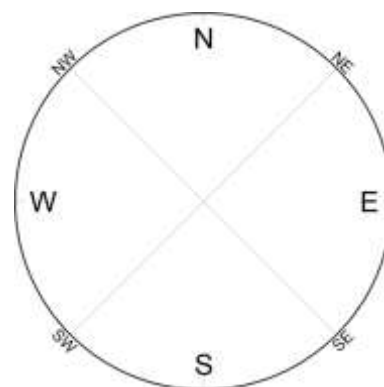
The overall aspect of the site and its topography should be recorded separately (see Box 4.1). Note the distinction between level and flat ground: a continuous slope can still be flat. 'None dominant' may be recorded where the site slopes equally facing two or more aspects. Where slopes and banks or cliffs occur the general aspect of these should also be recorded.

#### Box 4.1 – Determining aspect

Aspect can be determined as the following:

- North facing – from north west (315°) to north east (45°)
- East facing – from north east (45°) to south east (135°)
- South facing – from south east (135°) to south west (225°)
- West facing – from south west (225°) to north west (315°)

It is not necessary to determine aspect on a finer scale.



#### 4.2.2 Substrate

|  |  |  |   |
|--|--|--|---|
| <b>Q15 Are any of the following substrates are present? Tick all that apply.</b> |  |  |   |
| <input type="checkbox"/> Original soil   | <input type="checkbox"/> Rubble          | <input type="checkbox"/> Chemical wastes           | <input type="checkbox"/> Blast furnace slag     |
| <input type="checkbox"/> Dumped topsoil  | <input type="checkbox"/> Brick           | <input type="checkbox"/> Colliery spoils           | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> Sand  | <input type="checkbox"/> Concrete/tarmac | <input type="checkbox"/> Pulverised Fuel Ash (PFA) |   |
| <input type="checkbox"/> Stones  | <input type="checkbox"/> Quarry spoil    | <input type="checkbox"/> Leblanc waste             |   |

The development of OMH is intimately linked with the substrate available for plants to grow in and other species to utilise. Of particular interest are the substrates brought into the site, which limit plant growth and, due to reduced competition from more vigorous species, can lead to the formation of unusual plant communities. Some substrates also provide nesting, oviposition, basking and hunting or foraging surfaces for animals. The presence of the following substrates should be recorded:

- **Original soil** – soil that originates on the site.
- **Dumped topsoil** – nutrient rich soil brought in from outside the site. It is often spread during remediation but may be left in a pile.
- **Sand** – either brought in from outside or forming the natural substrate and exposed through extraction and other activities.
- **Stones** – can be small to relatively large and either brought in or moved around the site.
- **Rubble** – including various types of small to medium artificial debris, such as from building demolition or broken up concrete or tarmac, but excluding brick.
- **Brick** – includes any type of ceramic used in masonry, either complete bricks or brick rubble.
- **Concrete/tarmac** – intact concrete or tarmac plates only. Broken up concrete and tarmac should be included under rubble.
- **Quarry spoil** – waste extraction material from quarrying.
- **Chemical wastes** – covers a range of generally harmful chemical by-products, which may not always be visible but will affect plant growth. Note that sites with heavy metal contamination may be calaminarian grassland and therefore not OMH.
- **Colliery spoils** – the solid residual material resulting from mining coal that contains coal and stones intermixed. Once weathered, coal spoil can be very acidic, with pH values as low as 2.5, and thus supports calcifugous plant species.
- **Pulverised Fuel Ash (PFA)** – a waste product of pulverised fuel fired power stations that is grey with a fine dust texture. It is highly alkaline, preventing most plant growth, but leaches over time to allow the development of very diverse plant communities.
- **Leblanc waste** – a by-product of a historic process, which weathers down to calcium carbonate and supports very diverse communities of calcicolous plants. Very few Leblanc waste sites remain in the UK, most of which are SSSIs or LNRs.
- **Blast furnace slag** – a by-product of metal smelting that is nutrient poor and generally alkaline, and so can support diverse plant communities.
- **Other** - substrates not covered by the other options should be specified.

#### 4.2.3 Water features

|  |   |   |  |
|--|---|---|--|
| <b>Q16 Are any of the following water features present? Tick all that apply.</b> |   |   |  |
| <input type="checkbox"/> River   | <input type="checkbox"/> Freshwater ditch         | <input type="checkbox"/> Dry ditch                | <input type="checkbox"/> Other (please describe) |
| <input type="checkbox"/> Stream  | <input type="checkbox"/> Saline or brackish ditch | <input type="checkbox"/> Lake (greater than 2 ha) |  |

Features such as streams, ditches and lakes provide additional ecological diversity to a site, often leading to a dramatic increase in the number of plant and invertebrate species present. Though not required for a site to be considered OMH, recording water features helps to

indicate the likely quality of the site. The presence of water features under the following categories should be recorded for the whole site:

- **Lake** - any inland water body larger than 2 ha.
- **River** - running water more than 2.5 m wide.
- **Stream** - running water less than 2.5 m wide.
- **Wet ditch** - a man-made waterbody more than 20 times long than it is wide, containing water at the time of survey.
- **Dry ditch** - as above, but dry at the time of survey.

Note that ponds, pools and temporary pools are recorded as habitats and vegetation types under question 18.

#### 4.2.4 On site activities

|   |  |   |
|---|--|---|
| Q17 Are any of the following activities currently or recently occurring on the site? Tick all that apply. |  |   |
| <input type="checkbox"/> Fly tipping  | <input type="checkbox"/> Wild or domestic animal grazing | <input type="checkbox"/> Off-road bike, motorcycle or car use |
| <input type="checkbox"/> Small scale domestic tipping   | <input type="checkbox"/> Cutting or mowing               | <input type="checkbox"/> Foot traffic                         |
| <input type="checkbox"/> Bulldozing or other clearance  | <input type="checkbox"/> Fire                            | <input type="checkbox"/> None                                 |
| <input type="checkbox"/> Other (please describe)  |  |   |

Recording the activities that are occurring on site helps to explain the survey results. Only current activities are recorded.

The following categories can be recorded:

- **Fly tipping** – should be recorded where large quantities of general rubbish have been dumped on the site.
- **Small scale domestic tipping** – should be recorded where smaller quantities of rubbish have been dumped, including garden waste that has clearly come from neighbouring properties.
- **Bulldozing or other clearance** – where material and vegetation is being removed and the site levelled, often in preparation for development.
- **Wild or domestic animal grazing** – this can include grazing by cattle, sheep, goats, horses, deer, rabbits and a range of other animals.
- **Cutting or mowing** – these generally occur as part of the management of the site, but can include informal cutting and mowing.
- **Fire** – including localised and more widespread fire.
- **Off-road bike, motorcycle or car use** – visible as tracks and other ground disturbance.
- **Foot traffic** – including any clear sign that the site is used by the public, such as paths and trampled areas.
- **None** – where there is no management or any other activity on the site.
- **Other** – please specify the type of activity.

### 4.3 Vegetation

The vegetation section of the form is used to record the types of habitat within the site, structural characteristics of the vegetation and specific plant groups that are of known importance, primarily to invertebrates.

#### 4.3.1 Habitats and vegetation types

**Q18 How much of the site is covered by the following habitats and vegetation types. Tick one box for each habitat or vegetation type present, excluding the larger water features recorded above.**

|                               |   | Up to 10%                | >10% to 25%              | >25% to 50%              | >50% to 100%             |
|-------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Early successional vegetation | Bare ground                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Sparse vegetation                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Stress tolerant annuals                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Moss or liverwort communities                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Lichen communities                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Other pioneer vegetation                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Grassland                     | Acid  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Neutral                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Rank neutral                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Calcareous                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Herb dominated                | Tall herb                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Creeping herb                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Heathland                     | Heather                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Lichen/bryophyte heath                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Woodland and scrub            | Scrub   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Scattered trees                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Woodland (greater than 20% canopy cover)      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Marshy grassland                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Wetland                       | Inundation vegetation or seasonally wet areas | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Saline/brackish seasonally wet areas          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Swamp, fen or bog                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Pools (less than 25 m <sup>2</sup> )          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Water features                | Ponds (25 m <sup>2</sup> to 2 ha)             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|                               | Temporary pools                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OMH is characterised by usually having a range of different habitats, often in small intermixed patches but sometimes as extensive homogeneous blocks. The percentage of the site that is covered by each habitat should be estimated and recorded by ticking the appropriate box, regardless of how small the habitat patch may be. They are listed hierarchically, with narrowly defined habitats under broader groupings:

- Early successional vegetation
  - Bare ground – larger (over 50 cm by 50 cm) areas of bare ground, either soil or other substrates.
  - Sparse vegetation – plants of various kinds interspersed with smaller (less than 50 cm by 50 cm) areas of bare ground. Sparse stress tolerant annuals, mosses or liverworts and lichens should be included in the following categories.
  - Stress tolerant annuals – annual plants that are adapted to low nutrient availability, such as thyme-leaved sandwort *Arenaria serpyllifolia*, common centaury *Centaurea erythraea*, fairly flax *Linum catharticum* or hare's-foot clover *Trifolium arvense*. Where these occur with greater than 20% grasses they should be included in the appropriate grassland community.
  - Moss or liverwort communities – areas dominated by mosses or liverworts with few or no other plants, but excluding lichen and bryophyte heaths.

- Lichen communities – areas dominated by lichens with few or no other plants, but excluding lichen and bryophyte heaths.
- Other pioneer vegetation – other early successional vegetation.
- Grassland – grass dominated vegetation
  - Acid – usually species poor grassland that has developed on lime-deficient substrates and is characterised by species such as heath bedstraw *Galium saxatile*, sheep's fescue *Festuca ovina*, common bent *Agrostis capillaris*, sheep's sorrel *Rumex acetosella*, sand sedge *Carex arenaria*, wavy hair-grass *Deschampsia flexuosa*, bristle bent *Agrostis curtisii*, mouse-ear hawkweed *Pilosella officinarum* and tormentil *Potentilla erecta*.
  - Neutral – grassland that lack species strongly associated with acid or calcareous soils, including both short- and long-turfed grassland but excluding rank neutral grassland. Marshy neutral grassland should be recorded under marshy grassland.
  - Rank neutral – tall, dense grassland dominated by coarse grasses, such as false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata*, tufted hair-grass *Deschampsia caespitosa*, Yorkshire-fog *Holcus lanatus*, wood small-reed *Calamagrostis epigejos* and common couch *Elymus repens*. It does not include tor grass *Brachypodium pinnatum* or upright brome *Bromopsis erecta* dominated areas, which should be included under calcareous grassland.
  - Calcareous – species rich grassland that has developed on base-rich substrates (including PFA, Leblanc waste and blast furnace slag). It is characterised by species such as common rock-rose *Helianthemum nummularium*, carline thistle *Carlina vulgaris*, kidney vetch *Anthyllis vulneraria*, wild thyme *Thymus polytrichus*, small scabious *Scabiosa columbaria*, salad burnet *Sanguisorba minor*, fairy flax *Linum catharticum*, mouse-ear hawkweed *P. officinarum*, yellow-wort *Blackstonia perfoliata*, quaking-grass *Briza media*, sheep's fescue *F. ovina* and glaucous sedge *Carex flacca*.
- Herb dominated – vegetation dominated by broad-leaved herbs
  - Tall herb – vegetation dominated by tall herbs, such as rosebay willowherb *Chamaenerion angustifolium*, greater willowherb *Epilobium hirsutum*, common nettle *Urtica dioica*, wild carrot *Daucus carota*, toadflaxes *Linaria* spp., mugwort or wormwood *Artemisia* spp. common fleabane *Pulicaria dysenterica* and weld *Reseda luteola*. Japanese knotweed *Fallopia japonica* should also be recorded here, as well as question 22. Where these occur with greater than 20% grass should be included in the relevant grassland community.
  - Creeping herb – low-growing herbaceous plants that spread using runners, such as creeping cinquefoil *Potentilla reptans*, creeping buttercup *Ranunculus repens*, wild strawberry *Fragaria vesca*, mouse-ear hawkweed *P. officinarum* and ground ivy *Glechoma hederacea*. Where these occur with greater than 20% grass should be included in the relevant grassland community.
- Heathland
  - Dwarf scrub – vegetation with at least 25% cover of ling *Calluna vulgaris*, bell heather *Erica cinerea*, cross-leaved heath *E. tetralix*, bilberry *Vaccinium myrtillus*, western gorse *Ulex gallii* and dwarf gorse *U. minor*. Other ericaceous species may also occur. European gorse *U. europaeus* should be recorded under scrub.
  - Lichen/bryophyte heath – lichen (often *Cladonia* species) and bryophyte communities on acid substrates where there is less than 30% cover by vascular plants. It is generally found in association with other heathland or acid grassland vegetation.



- Woodland and scrub
  - Scrub – woody vegetation generally between 0.5 m and 5 m high and consisting of plants with many stems (Barkman, 1990). Areas of continuous scrub over 0.25 ha should be treated as woodland. Early flowering scrub species can provide a very important resource for nectar feeding invertebrates.
  - Scattered trees – where the canopies of the trees cover less than 20% of the area, allowing sufficient space between to still be considered open.
  - Woodland (greater than 20% canopy cover) – where the canopies of the trees cover 20% of the area or more. This is a closed habitat, so areas over 0.25 ha will generally be excluded from OMH site boundaries.
- Wetland
  - Marshy grassland – grasslands that have a high water table and include species such as purple moor grass *Molinia caerulea*, rushes *Juncus* spp., sedges *Carex* spp., meadowsweet *Filipendula ulmaria*, marsh marigold *Caltha palustris* and valerians *Valeriana* spp.
  - Inundation vegetation or seasonally wet areas – areas that are subject to periodic inundation or seasonal flooding of fresh water. They therefore contain plants that are adapted to periodic wetting or submergence, such as knotgrasses *Polygonum* spp., bistorts *Persicaria* spp., bulbous rush *Juncus bulbosus*, bur-marigolds *Bidens* spp., creeping bent *Agrostis stolonifera* and marsh foxtail *Alopecurus geniculatus*.
  - Saline/brackish seasonally wet areas – areas that are subject to periodic inundation or seasonal flooding of saline or brackish water. They therefore contain plants that are adapted to periodic submergence and saline conditions, including plants more typical of saltmarsh.
  - Swamp, fen or bog – includes areas of tall wetland vegetation, wet flushes, peat and mineral mires and *Sphagnum* bogs.
- Water features
  - Pools (less than 25 m<sup>2</sup>) – a body of standing water less than 25 m<sup>2</sup>.
  - Ponds (25 m<sup>2</sup> to 2 ha) – a body of standing water 25 m<sup>2</sup> to 2 ha in area which usually holds water for at least 4 months of the year.
  - Temporary pools – pools that are more ephemeral and hold water for less than 4 months of the year.

A pictorial guide to the habitats and vegetation types can be found in Appendix D.

#### 4.3.2 Vegetation structure

|   |   |  |
|---|---|--|
| <b>Q19 Rank the abundance of the following vegetation structural elements on the DAFOR scale.</b><br>DAFOR scale: D - Dominant; A - Abundant; F - Frequent; O - Occasional; R - Rare; N - None. |   |  |
| <input type="checkbox"/> Grass tussocks   | <input type="checkbox"/> Dead stems or seed heads | <input type="checkbox"/> Prostrate bramble |

Vegetation structure is highly important for invertebrates and other species, as it provides shelter, nesting sites and hibernation sites. The frequency of grass tussocks, dead stems or seed heads and prostrate bramble should be recorded on the DAFOR scale. Where the structural elements are not present this should also be recorded.

Prostrate bramble refers to horizontally growing bramble and should not include dense scrub comprised of bramble.

Dead stems and seed heads can include dead stems of flowering plants and substantial grasses, such as reeds.

### 4.3.3 Plant resources

**Q20 What is the average number of the following per square metre. Consider dead vegetation, stems and seed heads as well as living plants and flowers. Provide approximate figures for each or tick the 'Not assessed' box. Space is provided to record from up to five areas to improve accuracy. Nectaring plants are flowers that provide valuable nectar or pollen resources and are recorded whether or not they are in flower.**

|                             | 1 | 2 | 3 | 4 | 5 | Average number per m <sup>2</sup> | Not assessed |
|-----------------------------|---|---|---|---|---|-----------------------------------|--------------|
| All plant species           |   |   |   |   |   |                                   |              |
| Species of nectaring plant  |   |   |   |   |   |                                   |              |
| Individual nectaring plants |   |   |   |   |   |                                   |              |

A wider range of plant species on a site provides a wider range of food plants for phytophagous species. This means that high plant diversity generally means high animal diversity.

Nectaring plants are flowers that provide valuable nectar or pollen resources, many of which are detailed in Box 4.2. They are highly important for many flying invertebrates, so large numbers of nectaring plants can support larger invertebrate populations.

Having a wide range of plant species ensures that nectar or pollen is available at different times of the day and year (Figure 4.1). As a result, plants that are not in flower at the time of the visit but will flower at different times of the year are equally important. Appendix D provides details of the flowering times of some of the plants likely to be found on OMH sites.



Figure 4.1 –Goat willow *Salix caprea* is an important early nectar source. © Alan Stubbs/Buglife, 2010.

The average numbers of the following per square metre should be recorded where possible:

- all plant species
- nectaring plant species
- individual nectaring plants – counting total number of plants, regardless of species

### Box 4.2 – Nectaring plants

The following lists some of the plants that are considered to be important sources of nectar or pollen for invertebrates. Note that this list is incomplete and additional nectar or pollen providing plants should also be recorded. One way of determining whether a plant provides nectar and pollen is to assess the number of invertebrates on the flowers.

- buttercups *Ranunculus* spp.
- stonecrops *Sedum* spp.
- goat's-rue *Galega officinalis*
- kidney vetch *Anthyllis vulneraria*
- bird's-foot trefoils *Lotus* spp.
- vetches *Vicia* spp.
- broad-leaved everlasting-pea *Lathyrus latifolius*
- melilots *Melilotus* spp.
- medicks *Medicago* spp.
- clovers *Trifolium* spp.
- broom *Cytisus scoparius*
- gorse *Ulex* spp.
- blackthorn *Prunus spinosa*
- hawthorn *Crataegus* spp.
- bramble *Rubus fruticosus*
- agrimony *Agrimonia eupatoria*
- white bryony *Bryonia dioica*
- willows/sallows *Salix* spp.
- St. John's worts *Hypericum* spp.
- mallows *Malva* spp.
- rock-roses *Helianthemum* spp.
- weld or mignonette *Reseda* spp.
- Japanese knotweed *Fallopia japonica*
- champions and catchflies *Silene* spp.
- soapwort *Saponaria officinalis*
- pinks *Dianthus* spp.
- cowslip *Primula veris*
- orache *Atriplex* spp.
- heathers *Calluna vulgaris* and *Erica* spp.
- bilberry *Vaccinium myrtillus*
- lady's bedstraw *Galium verum*
- viper's-bugloss *Echium vulgare*
- toadflaxes *Linaria* spp.
- mulleins *Verbascum* spp.
- figworts *Scrophularia* spp.
- butterfly-bush *Buddleja davidii*
- black horehound *Ballota nigra*
- dead-nettles *Lamium* spp.
- hemp-nettles *Galeopsis* spp.
- white horehound *Marrubium vulgare*
- selfheal *Prunella vulgaris*
- wild basil *Clinopodium vulgare*
- wild marjoram *Origanum vulgare*
- thymes *Thymus* spp.
- mints *Mentha* spp.
- clarys *Salvia* spp.
- red bartsia *Odontites vernus*
- bellflowers *Campanula* spp.
- burdocks *Arctium* spp.
- thistles *Carduus* spp., *Cirsium* spp. and *Onopordum* spp.
- knapweeds and cornflowers *Centaurea* spp.
- chicory *Cichorium intybus*
- cat's-ears *Hypochaeris* spp.
- hawkbits *Leontodon* spp.
- bristly Oxtongue *Picris echioides*
- dandelion *Taraxacum* spp.
- hawk's-beards *Crepis* spp.
- mouse-ear hawkweed *Pilosella officinarum*
- hawkweeds *Hieracium* spp.
- goldenrod *Solidago* spp.
- asters *Aster* spp.
- Michaelmas daisy *Aster novi-belgii*
- blue fleabane *Erigeron acer*
- tansy *Tanacetum vulgare*
- mugworts and wormwoods *Artemisia* spp.
- yarrow *Achillea millefolium*
- camomiles *Anthemis* spp.
- corn marigold *Glebionis segetum*
- oxeye daisy *Leucanthemum vulgare*
- mayweeds and pineappleweed *Matricaria* spp. and *Tripleurospermum* spp.
- ragworts *Senecio* spp.
- colt's-foot *Tussilago farfara*
- red valerian *Centranthus ruber*
- wild teasel *Dipsacus fullonum*
- field scabious *Knautia arvensis*
- small scabious *Scabiosa columbaria*
- common ivy *Hedera helix*
- cow parsley *Anthriscus sylvestris*
- wild parsnip *Pastinaca sativa*
- hogweed *Heracleum sphondylium*
- wild carrot *Daucus carota*

Accurately recording the number of individual nectaring plants would be difficult and time consuming, as many have runners or rhizomes that mean that plants that appear separate are actually connected and part of the same plant. Instead, individual nectaring plants should be counted where they are separately rooted ('functionally separate') and either have flowering stems or be well developed and able to produce flowers.

Space is provided on the form for recording from up to five square metres (quadrats), which can be spread across the site to record the variability and used to record an average. It is useful to spread the five quadrats between different plant communities, rather than spacing them equally across the site as a whole. The averages therefore do not need to be the average of the five, as they should also take account of the proportion of the site covered by each community sampled.

#### 4.3.4 Plant groups

**Q21 Rank the abundance of the following plants on the DAFOR scale.**  
 DAFOR scale: D - Dominant; A - Abundant; F - Frequent; O - Occasional; R - Rare.

|   |  |  |
|---|--|--|
| <input type="checkbox"/> Daisy family                     | <input type="checkbox"/> Pea family              | <input type="checkbox"/> St. John's worts            |
| <input type="checkbox"/> White                            | <input type="checkbox"/> Clovers                 | <input type="checkbox"/> Stonecrops                  |
| <input type="checkbox"/> Mayweeds                         | <input type="checkbox"/> Bird's-foot trefoils    | <input type="checkbox"/> Teasel                      |
| <input type="checkbox"/> Oxeye daisy                      | <input type="checkbox"/> Vetches                 | <input type="checkbox"/> Valerian                    |
| <input type="checkbox"/> Purple and blue                  | <input type="checkbox"/> Gorse                   | <input type="checkbox"/> Weld and mignonette         |
| <input type="checkbox"/> Thistles                         | <input type="checkbox"/> Yellow and white umbels | <input type="checkbox"/> White bryony                |
| <input type="checkbox"/> Knapweeds and cornflowers        | <input type="checkbox"/> Wild carrot             | <input type="checkbox"/> Blackthorn and hawthorn     |
| <input type="checkbox"/> Yellow and orange                | <input type="checkbox"/> Borage family           | <input type="checkbox"/> Sallow                      |
| <input type="checkbox"/> Mugwort and wormwood             | <input type="checkbox"/> Viper's bugloss         | <input type="checkbox"/> Bracken                     |
| <input type="checkbox"/> Ragwort                          | <input type="checkbox"/> Yellow crucifers        | <input type="checkbox"/> Nettles                     |
| <input type="checkbox"/> Fleabanes (yellow, blue & white) | <input type="checkbox"/> Annual mercury          | <input type="checkbox"/> Sycamore                    |
| <input type="checkbox"/> Figwort family                   | <input type="checkbox"/> Crane's-bills           | <input type="checkbox"/> Invasive non-native species |
| <input type="checkbox"/> Toadflaxes                       | <input type="checkbox"/> Mallows                 | <input type="checkbox"/> Buddleja                    |
| <input type="checkbox"/> Mulleins                         | <input type="checkbox"/> Pinks                   | <input type="checkbox"/> Japanese knotweed           |
| <input type="checkbox"/> Mint family                      | <input type="checkbox"/> Scabious                |  |

Plant groups are recorded rather than individual species for two reasons:

- In order to assess the value of the site for key invertebrate groups, the actual species are not as important as the range of broad groups of plants. For example, clovers are important for long-tongued bees. The precise species is not as important, though the value may vary from species to species.
- Due to the wide range of native and non-native species that can occur in OMH because of the varied nature of the habitat, the identification of all individual species is a difficult task, even for many experts. This methodology has been designed so that non-botanists can use it.

The plant groups are arranged hierarchically, so that mugwort can be recorded as 'Mugwort and wormwood', 'Yellow and orange [members of the daisy family]' or '[members of the] Daisy family', depending upon the level of competence of the surveyor. In addition, plants that do not fit into one of the more narrowly defined groups can always be included in higher level groupings.

The frequency of each plant or plant group should be recorded on the DAFOR scale. The groupings are defined as follows:

- Daisy family – all members of the daisy family (composites, or Asteraceae) that do not have white, purple, blue, yellow or orange flowers. This will thus mainly be used to

record pink- or red-flowered composites, such as red varieties of Michaelmas daisy *Aster* spp. The colour of the flower refers to the dominant colour, so daisy *Bellis perennis* flowers would be considered white because more of the area of the flower is comprised of the white ray florets than the yellow disc florets.

- White – all members of the daisy family with predominantly white flowers, except for those species listed below and fleabanes. This includes yarrow *Achillea millefolium*, daisy *Bellis perennis*, feverfew *Tanacetum parthenium*, and gallant soldier *Galinsoga parviflora* and *G. quadriradiata*.
  - Mayweeds – a range of composites with white ray florets and yellow disc florets and with finely divided leaves. This includes scentless mayweed *Tripleurospermum inodorum*, sea mayweed *Tripleurospermum maritimum*, stinking chamomile *Anthemis cotula*, wild chamomile *Matricaria recutita*, corn chamomile *Anthemis arvensis*. It also includes species without white ray florets, such as pineapple weed *Matricaria discoidea*.
  - Oxeye daisy – includes just one species, *Leucanthemum vulgare*.
- Purple and blue – all members of the daisy family with predominantly purple and blue flowers, except for those species listed below and fleabanes. This includes burdocks *Arctium* spp., chicory *Cichorium intybus*, blue sow-thistle *Cicerbita macrophylla*, hemp agrimony *Eupatorium cannabinum* and salsify *Tragopogon porrifolius*.
  - Thistles – all purple or blue thistles, including spear thistle *Cirsium vulgare*, creeping thistle *Cirsium arvense*, welted thistle *Carduus crispus*, musk thistle *Carduus nutans* (Figure 4.2), slender thistle *Carduus tenuiflorus*, Scotch thistle *Onopordum acanthium*, milk thistle *Silybum marianum* and Plymouth thistle *Carduus pycnocephalus*.



Figure 4.2 – Purple thistles (musk thistle *Carduus nutans*), with ragwort *Senecio* spp. on the right and weld *Reseda luteola* in the background. © Steven Falk/Buglife, 2013.



- Knapweeds and cornflowers – exclusively *Centaurea* species, including common knapweed *C. nigra*, greater knapweed *C. scabiosa*, cornflower *C. cyanus*, alpine cornflower *C. montana*, star thistle *C. calcitrapa* and rough star-thistle *C. aspera*.
- Yellow and orange – a wide range of yellow- and orange-flowered composites that are not covered by the species below or fleabanes. This includes species of dandelion *Taraxacum*, hawkbits *Leontodon*, sow thistles *Sonchus*, hawk's-beards *Crepis*, cudweeds *Gnaphalium*, goldenrods *Solidago*, hawkweeds *Hieracium*, mouse-ear hawkweeds *Pilosella* (Figure 4.3), nipple-wort *Lapsana communis*, coltsfoot *Tussilago farfara*, tansy *Tanacetum vulgare* and goat's beard *Tragopogon pratensis*.



Figure 4.3 – Fox-and-cubs *Pilosella aurantiaca*. © Ann Fells/exeGesIS SDM Ltd., 2012.

- Mugwort and wormwood – species in the genus *Artemisia*, including mugwort *A. vulgaris*, wormwood *A. absinthium* and Chinese mugwort *A. verlotiorum*, as well as sea wormwood *Seriphidium maritimum*.
- Ragwort – exclusively species in the genus *Senecio*, including ragwort *S. jacobaea*, Oxford ragwort *S. squalidus*, groundsel *S. vulgaris*, sticky groundsel *S. viscosus*, wood groundsel *S. sylvaticus*, marsh ragwort *S. aquaticus* and hoary ragwort *S. erucifolius* (Figure 4.2).
- Fleabanes (yellow, blue & white) – the most common fleabanes likely to be encountered are yellow flowered, but both blue and white flowered fleabanes frequently occur in OMH. Yellow fleabanes include fleabane *Pulicaria dysenterica*, Canadian fleabane *Conyza canadensis*, Argentine fleabane *Conyza bonariensis*, Guernsey fleabane *Conyza sumatrensis* and lesser fleabane *Pulicaria vulgaris* (the latter may be found in wet areas). Blue fleabanes include blue fleabane *Erigeron acer*. White fleabanes include Mexican fleabane *Erigeron karvinskianus* and tall fleabane *Erigeron annuus*.
- Figwort family – includes all members of the figwort family (Scrophulariaceae) except those mentioned below, such as figworts *Scrophularia* spp., speedwells *Veronica* spp., eyebrights *Euphrasia* spp., red bartsia *Odontites vernus*, yellow bartsia *Parentucellia viscosa* and Musk *Mimulus moschatus*.

- Toadflaxes – including all species in the genus *Linaria* (Figure 4.4) as well small toadflax *Chaenorhinum minus*, ivy-leaved toadflax *Cymbalaria muralis* and snapdragon *Antirrhinum majus*.



Figure 4.4 – Purple toadflax *Linaria purpurea*. © Ann Fells/exeGesIS SDM Ltd., 2012.

- Mulleins – exclusively species from the genus *Verbascum*, especially great mullein *V. thapsus*, slender mullein *V. virgatum* and dark mullein *V. nigrum* (Figure 4.5).



Figure 4.5 – White mullein *Verbascum lychnitis*, an uncommon species that can be found on OMH sites. © Mike Lush/exeGesIS SDM Ltd., 2012.

- Pea family – includes a wide range of plants in the pea family (Fabaceae) not included in the categories below, such as vetchlings, bitter-vetches and everlasting peas *Lathyrus* spp., melilots *Melilotus* spp., lupins *Lupinus* spp., broom *Cytisus scoparius*, Spanish broom *Spartium junceum* and larger medicks *Medicago* spp.
  - Clovers – includes familiar species from the genus *Trifolium*, plus smaller species of *Medicago* with trifoliate leaves including black medick *M. lupulina*, spotted medick *M. arabica*, fimbriate medick *M. polymorpha* and small medick *M. minima*.
  - Bird's-foot trefoils – exclusively species from the genus *Lotus*, including common bird's-foot trefoil *L. corniculatus* (Figure 4.6), narrow-leaved bird's-foot trefoil *L. glaber* and greater bird's-foot trefoil *L. pedunculatus*.





Figure 4.6 – Common bird’s-foot trefoil *Lotus corniculatus*. © Ann Fells/exeGesIS SDM Ltd., 2012.

- Vetches – primarily species in the genus *Vicia*, especially hairy tare *V. hirsuta* common vetch *V. sativa*, tufted vetch *V. cracca* and smooth tare *V. tetrasperma*. Vetch like plants can also be included (Figure 4.7), such as goat’s rue *Galega officinalis*, Crown Vetch *Securigera varia* and kidney vetch *Anthyllis vulneraria*.



Figure 4.7 – Wild liquorice *Astragalus glycyphyllos* is ‘vetch like’ and should therefore be recorded with vetches. © Mike Lush/exeGesIS SDM Ltd., 2012.

- Gorse – species from the genus *Ulex*, primarily European gorse *U. europaeus*, but also including western gorse *U. gallii* and dwarf gorse *U. minor* in heathland sites.
- Yellow and white umbels – includes any yellow and white flowered species of umbellifer (Apiaceae), such as cow parsley *Anthriscus sylvestris*, wild parsnip *Pastinaca sativa* and hogweed *Heracleum sphondylium*, but does not include wild carrot.
  - Wild carrot – includes just one species, *Daucus carota*.
- Borage family – includes any member of the borage family (Boraginaceae) except for viper’s bugloss. This includes borage *Borago officinalis*, comfrey *Symphytum* spp., forget-me-not *Myosotis* spp., green alkanet *Pentaglottis sempervirens*, hound’s tongue *Cynoglossum* spp. and lungwort *Pulmonaria* spp.
  - Viper’s bugloss – includes just one species, *Echium vulgare* (Figure 4.8).



Figure 4.8 – Six-spot burnet moth *Zygaena filipendulae* feeding on viper's bugloss *Echium vulgare*. © Tim Taylor/exeGesIS SDM Ltd., 2012.

- Mint family – includes a wide range of often aromatic plants from the mint family (Lamiaceae), such as dead-nettles and henbit *Lamium* spp., selfheal *Prunella vulgaris*, hemp-nettles *Galeopsis* spp., ground ivy *Glechoma hederacea*, wild marjoram *Origanum vulgare*, woundworts *Stachys* spp., mints *Mentha* spp., black horehound *Ballota nigra*, white horehound *Marrubium vulgare*, balm *Melissa officinalis*, clary *Salvia* spp. and thyme *Thymus* spp.
- Yellow crucifers – yellow-flowered species in the cabbage family (Brassicaceae), all of which have four equal petals. Included are species in the genera *Sinapis*, *Sisymbrium*, *Brassica*, *Erysimum*, *Raphanus*, *Rorippa*, *Diplotaxis* and *Barbarea*.
- Annual mercury – includes just one species *Mercurialis annua*.
- Crane's-bills – exclusively species from the genus *Geranium*, including dove's foot cranesbill *G. molle*, cut-leaved cranesbill *G. dissectum*, hedgerow cranesbill *G. pyrenaicum*, herb robert *G. robertianum*, small-flowered cranesbill *G. pusillum*, long-stalked cranesbill *G. columbinum*, French cranesbill *G. endressii*, pencilled cranesbill *G. versicolor* and a wide range of garden plants.
- Mallows – species in the genera *Malva* and *Lavatera*, especially musk mallow *M. moschata*, common mallow *M. sylvestris*, tree mallow *L. arborea* and dwarf mallow *M. neglecta*.
- Pinks – includes the larger species in the pink family (Caryophyllaceae), regardless of the colour of the flower. Of particular importance areampions and catchflies *Silene* spp., the true pinks *Dianthus* spp., soapwort *Saponaria officinalis*, cowherb *Vaccaria hispanica* and corncockle *Agrostemma githago*.
- Scabious – includes field scabious *Knautia arvensis*, devil's bit scabious *Succisa pratensis* and small scabious *Scabiosa columbaria*.
- St. John's worts – exclusively species from the genus *Hypericum*, especially perforate St. John's-wort *H. perforatum*.
- Stonecrops – primarily species from the genus *Sedum* (Figure 4.9), but also including mossy tillaea *Crassula tillaea*.



Figure 4.9 – A stonecrop, surrounded by moss. © Alan Stubbs/Buglife, 2011.

- Teasel – exclusively species from the genus *Dipsacus*, primarily teasel *D. fullonum*, but small teasel *D. pilosus* is possible.
- Valerian – red valerian *Centranthus ruber* is most likely, but other valerians *Valeriana* and cornsalads *Valerianella* can be included.
- Weld and mignonette – exclusively species from the genus *Reseda*, primarily weld *R. luteola* (Figure 4.2) and wild mignonette *R. lutea* (Figure 4.10).



Figure 4.10 – Wild mignonette *Reseda lutea*, with viper's bugloss *Echium vulgare* in the background. © Steven Falk/Buglife, 2005.

- White bryony – includes just one species, *Bryonia dioica*.
- Blackthorn and hawthorn – the most likely species that may be recorded in this group are blackthorn *Prunus spinosa*, cherry plum *P. cerasifera*, bullace *P. domestica* subsp. *insititia*, hawthorn *Crataegus monogyna* and midland hawthorn *C. laevigata*. Various-



leaved hawthorn *C. heterophylla* and oriental hawthorn *C. orientalis* may also be rarely found on OMH sites.

- Sallow – round leaved shrubby members of the genus *Salix*. The primary species of importance are goat willow *S. caprea* and grey willow *S. cinerea*, both of which provide a valuable early nectar resource, though there may be confusion with later flowering species such as eared willow *S. aurita*, dark-leaved willow *S. myrsinifolia*, almond willow *S. triandra* and tea-leaved willow *S. phylicifolia*. Dwarf and prostrate willows, such as creeping willow *S. repens*, should not be included.
- Bracken – includes just one species, *Pteridium aquilinum*.
- Nettles – exclusively species from the genus *Urtica*, but primarily common nettle *U. dioica*.
- Sycamore – includes just one species, *Acer pseudoplatanus*.
- Invasive non-native species – includes any plant that is regarded as an invasive non-native except *Buddleja* spp. and Japanese knotweed, such as American skunk-cabbage *Lysichiton americanus*, Canadian goldenrod *Solidago canadensis*, giant hogweed *Heracleum mantegazzianum*, Himalayan balsam *Impatiens glandulifera* and Montbretia *Crocsmia* spp.
  - Buddleja – includes any species from the genus *Buddleja*, but primarily the common butterfly-bush *Buddleja davidii*.
  - Japanese knotweed – includes just one species, *Fallopia japonica*.


The presence of invasive non-native species does not necessarily reduce the quality of the site or its status as OMH, but would be regarded as a threat. Even the highly invasive Japanese knotweed, common butterfly bush and Himalayan balsam produce very large quantities of nectar (Andros, 2000; Raine & Chittka, 2007; Tallent-Halsell & Watt, 2009).

#### 4.4 Optional information

The last two pages of the survey form is an optional section that can be used to make notes on the site.

##### 4.4.1 Target notes

|  |             |
|--|-------------|
| <p><b>Q22 Target notes.</b> The following space can be used to make notes related to numbered target notes on the map. Continue on another sheet if necessary. See survey handbook for further guidance.</p> |             |
| Target note no.  | Description |
|  |             |
|  |             |

Use the target notes section in the same way as you would make target notes in a Phase 1 survey (Joint Nature Conservation Committee, 2010). Features of interest can be marked on the site map with a  symbol and a number. The target notes section can then be used to cross reference a description of the feature of interest with the number on the map. Features of interest can include the following:

- locations of rare, invasive or otherwise noteworthy plant or animal species
- descriptions of plant communities of interest
- localised patches of nectaring plants or other plant resources
- areas of older habitat within a larger block of younger habitat
- important areas for invertebrates, such as large concentrations of nesting solitary bees
- localised substrates
- localised management or recent changes to the site
- fly-tipping or other deposited waste



Figure 4.11 – Palmate newt *Lissotriton helveticus* eft. © Ann Fells/exeGesIS SDM Ltd., 2012.

#### 4.4.2 General site notes

|   |   |
|---|---|
| <b>Q23 The following box can be used to make notes on the site. The notes can cover:</b>  |   |
| <ul style="list-style-type: none"> <li>• A description of the site</li> <li>• Other Biodiversity Action Plan habitats present</li> <li>• The presence or abundance of notable species</li> <li>• Clarifications of things recorded elsewhere on the form</li> </ul> | <ul style="list-style-type: none"> <li>• The age and development of the site</li> <li>• Ownership and management</li> <li>• Public access, legal or otherwise</li> <li>• Threats</li> </ul> |

The notes section is to be used to record any information that is not recorded elsewhere on the form but may be useful in assessing the quality or condition of the site and for guiding future surveys.

#### 4.5 Plant species recording - optional

| <b>Q24 Plants.</b> The following space can be used to record the presence and frequencies of plants seen during the survey. Frequencies should be recorded using the DAFOR scale: D - Dominant; LD - Locally dominant; A - Abundant; LA - Locally abundant; F - Frequent; LF - Locally frequent; O - Occasional; R - Rare; N - None. Continue on another sheet if necessary. |       |         |       |         |       |
|--|-------|---------|-------|---------|-------|
| Species  | Freq. | Species | Freq. | Species | Freq. |
|  |       |         |       |         |       |
|  |       |         |       |         |       |

The plant species recording section can be used to make more detailed records of plants present on the site, which may help with assessments of diversity.

Defining a list of plant species likely to be found on OMH would be difficult, so the form has not been pre-populated with species names. Instead the name of the plant can be added, along with its frequency across the whole site. Local frequencies that are not recorded for questions 19 and 21 may be recorded for this question.

## 5 Following a survey

### 5.1 Determining whether OMH is present

A site should be regarded as OMH if it fulfils all the criteria in the UK BAP definition. Table 5.1 compares the BAP definition to the survey methodology and shows how the survey results may be used to determine the presence of OMH.

It is anticipated that the survey website (see Section 6) will eventually provide a results page once survey data has been submitted, which will state whether the site is likely to be OMH and indicate its likely quality.

Table 5.1 – A comparison of the UK Biodiversity Action Plan criteria for Open Mosaic Habitats (Biodiversity Reporting and Information Group, 2010) and the survey methodology. A site should be regarded as OMH if it fulfils all the criteria, which can be determined using the survey data.

|          | <b>BAP criterion</b>  | <b>Determining using survey data</b>  |
|----------|---|---|
| <b>1</b> | The area of open mosaic habitat is at least 0.25 ha in size.  | All potential OMH sites in the inventory or on the website should be at least 0.25 ha. The area of other sites surveyed will need to be determined.   |
| <b>2</b> | Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrates such as industrial spoil may have been added.  | One or more of the following have been recorded for question 10 on the survey form: <ul style="list-style-type: none"> <li>• 'Known history of disturbance'</li> <li>• 'Severely modified by previous use'</li> <li>• 'Extraneous material or substrates added'</li> </ul>  |
| <b>3</b> | The site contains some vegetation. This will comprise early successional communities consisting mainly of stress-tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are composed of (a) annuals, or (b) mosses/liverworts, or (c) lichens, or (d) ruderals, or (e) inundation species, or (f) open grassland, or (g) flower-rich grassland, or (h) heathland. | One or more vegetation types from the following groups have been recorded for question 18 on the survey form: <ul style="list-style-type: none"> <li>• 'Early successional vegetation', with the exception of 'Bare ground'</li> <li>• 'Grassland'</li> <li>• 'Herb dominated'</li> <li>• 'Heathland'</li> <li>• 'Inundation vegetation or seasonally wet areas'</li> </ul> |
| <b>4</b> | The site contains unvegetated, loose bare substrate and pools may be present.   | 'Bare ground' or 'Sparse vegetation' have been recorded for question 18 on the survey form.   |
| <b>5</b> | The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a)–(h) above (criterion 3) plus bare substrate, within 0.25 ha.  | See 4 and 5 above.  |

### 5.2 When and how to undertake further habitat survey

If the survey results suggest that OMH is present then it may be appropriate to undertake further habitat survey. Two survey methodologies are recommended: the method developed

by Riding *et al.* (2010); and extended Phase 1. They have different strengths and will be required for different purposes, which are summarised in Table 5.2. Both surveys will need to be undertaken by experienced ecologists.

It may also be appropriate to undertake 'Phase 2' surveys on some sites. This may be particularly useful where highly detailed information on the vegetation communities and their precise locations are required. These surveys should use the standard National Vegetation Classification (NVC) methodology, though many of the communities within OMH are likely to fall outside of the NVC and will need to be identified and described<sup>1</sup>. As a result of the poor fit to the NVC and the presence of higher numbers of non-native species not commonly found in the wider countryside, such surveys will need to be undertaken by expert botanists and phytosociologists.

Table 5.2 – A summary of further habitat survey methodologies recommended for gaining further detail on OMH sites.

| Method   | What it does  | When it should be used  |
|--|---|---|
| The Riding <i>et al.</i> (2010) methodology                  | <ul style="list-style-type: none"> <li>Collects more detailed quantitative information on the structure and composition of OMH.</li> <li>Collates background information.</li> </ul>            | <ul style="list-style-type: none"> <li>Where further detail on the habitat is required.</li> <li>To help prioritise important sites.</li> <li>Where individual site data will be analysed.</li> </ul> |
| Extended Phase 1 (Joint Nature Conservation Committee, 2010) | <ul style="list-style-type: none"> <li>Classifies and maps habitats to a national standard.</li> <li>Ensures that other importance is considered, such as legally protected species.</li> </ul> | <ul style="list-style-type: none"> <li>Where the site is due to be developed or altered.</li> <li>Where a habitat map is required.</li> </ul>   |

### 5.3 When and how to undertake an invertebrate survey

A detailed invertebrate study, consisting of a thorough desk study and targeted invertebrate survey, should be undertaken on OMH sites whenever one of the following applies:

- initial survey suggests that the site is of very high quality for invertebrates
- the site is identified as OMH using this survey methodology and is due to be developed or altered, including preparatory work
- before planning management of known OMH sites, as information on the species present will allow suitable management actions to be formulated

#### 5.3.1 Desk study

The desk study should establish which species might readily be expected in a given area, so that survey effort can be targeted accordingly. A good desk study can be especially valuable for establishing local emergence times for particular species, which may display geographical

<sup>1</sup> Although many OMH vegetation communities will not be included in the NVC this does not mean that they are any less or more important than those within the NVC. Communities not included in the NVC should be considered on their own merits, which in OMH may include diversity, rarity and uniqueness.

variance. It will also ensure that consultant entomologists working outside their local area are better equipped to assess the survey findings.

Desk studies should be completed prior to field survey to guide survey planning. A post-survey desk study is still valuable, as it should also be used to interpret the survey findings and identify any limitations in the survey.

Data sources for desk studies will vary from county to county, and even district to district. The appropriate data holders must be consulted, including Local Record Centres, field clubs or recording schemes, to ensure that all relevant data is collated.

### 5.3.2 Invertebrate survey

Basic guidance for undertaking an invertebrate survey can be found in English Nature (2005), with more detailed information in Drake *et al.* (2007). Further references to invertebrate survey methods can be found on the Institute of Ecology and Environmental Management's website at <http://www.ieem.net/invertebrates-terrestrial->. Invertebrate surveys should be undertaken following the methodology described in Drake *et al.* (2007) and should utilise the ISIS methodology. A specialist invertebrate surveyor should be used, who will be able to provide advice on the required survey intensity and the invertebrate groups that should be targeted.

Some of the key invertebrate groups on brownfield sites include:

- Araneae (spiders)
- Coleoptera (beetles)
- Diptera (flies)
- Hemiptera (true bugs)
- Hymenoptera (bees, wasps and ants)
- Lepidoptera (butterflies and moths)

May to late September is crucially important for many invertebrate assemblages, within which there should be at least two main survey periods (e.g. May to June and August to September). Visits outside of this period can be useful for targeting further survey, but are not adequate to determine importance for invertebrates. Three to seven full days of fieldwork will be required for a ten to fifty hectare site, though greater understanding of the resource will be obtained if more fieldwork days are included spread over the survey period. Single survey visits will not provide sufficient information to determine whether an important invertebrate assemblage is present within a known OMH site.

Standardised sweeping, spot sweeping from flowers, ground searching and beating should reveal enough of the fauna for a reasoned assessment. Vacuum sampling can be useful if the effort is standardised. This should not preclude the use of pitfall, water or malaise traps, the passive nature of which can overcome the vagaries of weather, but these are not a replacement for active fieldwork. It is also worth recognising that many invertebrate species will need to be identified under a microscope, which often requires more time than the field visit.

Fieldwork should be undertaken by a competent and experienced invertebrate specialist for five to seven hours per survey visit in summer, with less time usually needed in spring and autumn. Surveys should cover all parts of the site, though this may mean that for very large sites several full days are required per survey visit. The areas searched and trapped must be



mapped, allowing survey information to be related to a structural habitat survey so that key areas can be identified.

## 6 *The survey website*

A website for OMH survey has been developed and can be found at <http://habitatsurveys.no-ip.org/>. Through this website you can select sites to survey, download survey forms and enter survey data. The website also contains this methodology and the risk assessment in Appendix A.

Instructions on using the website can be found in the User Guide at <http://habitatsurveys.no-ip.org/user-guide>.

### 6.1 *OMH survey forum*

Once registered as a user on the survey website you will be able to access the forum. This has been designed to allow OMH surveyors to keep in touch and share information. It contains sections where you can:

- Ask questions about OMH survey.
- Record issues with the survey methodology, which can then inform future changes.
- Record any health and safety issues encountered. This is very important, as it allows the risks involved in OMH survey to be continuously monitored and mitigated for wherever possible.
- Request help on the identification of a species found on an OMH site.
- Talk about anything not covered by the above.

New sub-forums may be added where there is a demand for them.

## 7 *Glossary of terms*

**BAP:** see Biodiversity Action Plan.

**Biodiversity Action Plan:** the UK Biodiversity Action Plan is the UK Government's response to the Convention on Biological Diversity. It describes the biological resources of the UK and plans for the conservation of these resources. Significantly, action plans have been written to aid the recovery of threatened species and habitats, which are reported against to monitor progress.

**Brownfield:** an area that has been previously built on or used for industry.

**Calaminarian grassland:** grassland plant communities that develop on soils containing high levels of toxic metal ions.

**Calcifugous:** plants that do not grow well in lime-rich soil.

**Calcicolous:** plants that thrive in lime-rich soil.

**DAFOR scale:** a standard scale for recording plants: D - Dominant; A - Abundant; F - Frequent; O - Occasional; R - Rare; N - None. For question 24 on the OMH survey form local values can optionally be used to record patchiness in plant distributions across the site: LD - Locally dominant; LA - Locally abundant; LF - Locally frequent.

**Early successional habitats:** habitats and vegetation types that occur shortly after disturbance. See also habitat succession.

**GIS** (Geographical Information System): specialist mapping software that captures, stores, analyzes, manages, and presents data that are linked to location.

**Habitat continuity:** the continued presence of a habitat at a particular location over time.

**Habitat succession:** the development of a habitat over time, from the first colonists to the development of a stable community (often woodland).

**Homogeneous:** uniform in structure and composition throughout.

**LNR:** Local Nature Reserve.

**Mosaic (habitat):** a complex of small patches of plant communities, often with hard to define boundaries.

**Native species:** plants that developed, occur naturally or existed for many years in the area in which they are found, i.e. plants within their native range.

**Non-native species:** species outside of their native range.

**OMH:** Open Mosaic Habitat on Previously Developed Land.

**Oviposition:** egg laying, especially in insects.

**Phytophagous:** feeding on plants.

**Site of Special Scientific Interest:** areas that have been legally designated for their wildlife and geological importance.

**SSSI:** see Site of Special Scientific Interest.

**Stand:** an area within a site that contains a habitat type or management compartment that is different to those adjacent.

**Thermophilic:** requiring high temperatures for normal development. Most often applied to species that require relatively high temperatures.

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## Appendix A Survey form

### OPEN MOSAIC HABITAT ASSESSMENT FORM

Do not write outside of the grey areas

Page 1

| GENERAL INFORMATION   |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
|---|--------------------------|--|--------------------------|---|--------------------------|---|--------------------------|--|--------------------------|--|--------------------------|---|--|--|--|
| Q1 Site name: <input style="width: 90%;" type="text"/>  |                          |  |                          |   |                          | Q2 OS grid reference: <input style="width: 100%;" type="text"/>   |                          |  |                          |  |                          |   |  |  |  |
| Q3 Site ID: <input style="width: 80%;" type="text"/>  |                          |  |                          | Q4 Date: <input style="width: 10%; text-align: center;" type="text"/> / <input style="width: 10%; text-align: center;" type="text"/> / <input style="width: 10%; text-align: center;" type="text"/> |                          |   |                          | Q5 Is a site map available? Yes <input type="checkbox"/> No <input type="checkbox"/> |                          |  |                          |   |  |  |  |
| Q6 Surveyor: <input style="width: 90%;" type="text"/>   |                          |  |                          |   |                          | Q7 Time on site (hours): <input style="width: 50%;" type="text"/> |                          |  |                          |  |                          |   |  |  |  |
| Q8 I confirm that I have reviewed the site against the generic risk assessment for OMH survey and identified any additional risks.  |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Initial: <input style="width: 20%;" type="text"/>   |                          | Note any additional risks: <input style="width: 98%;" type="text"/>                |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Q9 Which best describes the survey access to the site? Tick all that apply.   |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Full access to the whole site  |                          | <input type="checkbox"/> From public right of way                                  |                          | <input type="checkbox"/> Viewed from site boundary  |                          | <input type="checkbox"/> Viewed from a distance                   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Full access to part of the site  |                          | <input type="checkbox"/> Other (describe) <input style="width: 80%;" type="text"/> |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Q10 Which of the following describe the site? Tick all that apply.  |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Known history of disturbance   |                          | <input type="checkbox"/> Severely modified by previous use                         |                          | <input type="checkbox"/> Extraneous materials or substrates added   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> No history of disturbance or past use  |                          | <input type="checkbox"/> Other (describe) <input style="width: 80%;" type="text"/> |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Q11 How old is the site? The number of years that the overall habitat has had to develop should be estimated if this is not known. Tick one.  |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Less than 5 years  |                          |  |                          | <input type="checkbox"/> 5 to 9 years   |                          |   |                          | <input type="checkbox"/> 10 to 19 years  |                          |  |                          | <input type="checkbox"/> 20 years or more |  |  |  |
| Q12 What other habitats and land use are within the surrounding landscape? Please check aerial photography and other information sources, in addition to investigating the surrounding area during the site visit. Tick one box for each habitat or land use. |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
|   | Adjacent                 | Within 2 km  | Within 10 km             |   | Adjacent                 | Within 2 km   | Within 10 km             |  | Adjacent                 | Within 2 km                            | Within 10 km             |   |  |  |  |
| Brownfield  | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | Hedgerows   | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> |  | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/> |   |  |  |  |
| Unimproved grassland  | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | Ditches   | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> |  | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/> |   |  |  |  |
| Improved grassland  | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | Quarry  | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> |  | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/> |   |  |  |  |
| Arable farmland   | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | Railway   | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> |  | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/> |   |  |  |  |
| Wetland   | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | Industry or housing   | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> |  | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/> |   |  |  |  |
| Heath or moorland   | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | Other (describe)  | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> |  | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/> |   |  |  |  |
| Scrub   | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Woodland  | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Coastal habitats  | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| SITE DESCRIPTION  |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Q13 What is the overall aspect of the site? Tick one.   |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> South facing   |                          | <input type="checkbox"/> North facing  |                          | <input type="checkbox"/> East facing  |                          | <input type="checkbox"/> West facing                              |                          | <input type="checkbox"/> Level   |                          | <input type="checkbox"/> None dominant |                          |   |  |  |  |
| Q14 What is the topography of the site like? Tick all that apply.   |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Flat ground  |                          | <input type="checkbox"/> Slopes and banks  |                          | <input type="checkbox"/> South facing   |                          | <input type="checkbox"/> North facing                             |                          | <input type="checkbox"/> East facing   |                          | <input type="checkbox"/> West facing   |                          |   |  |  |  |
| <input type="checkbox"/> Hollows  |                          | <input type="checkbox"/> Cliffs  |                          | <input type="checkbox"/>  |                          | <input type="checkbox"/>  |                          | <input type="checkbox"/>   |                          | <input type="checkbox"/>               |                          |   |  |  |  |
| <input type="checkbox"/> Mounds   |                          | <input type="checkbox"/>   |                          | <input type="checkbox"/>  |                          | <input type="checkbox"/>  |                          | <input type="checkbox"/>   |                          | <input type="checkbox"/>               |                          |   |  |  |  |
| Q15 Are any of the following substrates are present? Tick all that apply.   |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Original soil  |                          | <input type="checkbox"/> Rubble  |                          | <input type="checkbox"/> Chemical wastes  |                          | <input type="checkbox"/> Blast furnace slag                       |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Dumped topsoil   |                          | <input type="checkbox"/> Brick   |                          | <input type="checkbox"/> Colliery spoils  |                          | <input type="checkbox"/> Other (please specify)                   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Sand   |                          | <input type="checkbox"/> Concrete/tarmac   |                          | <input type="checkbox"/> Pulverised Fuel Ash (PFA)  |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Stones   |                          | <input type="checkbox"/> Quarry spoil  |                          | <input type="checkbox"/> Leblanc waste  |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Q16 Are any of the following water features present? Tick all that apply.   |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> River  |                          | <input type="checkbox"/> Freshwater ditch  |                          | <input type="checkbox"/> Dry ditch  |                          | <input type="checkbox"/> Other (please describe)                  |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Stream   |                          | <input type="checkbox"/> Saline or brackish ditch                                  |                          | <input type="checkbox"/> Lake (greater than 2 ha)   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| Q17 Are any of the following activities currently or recently occurring on the site? Tick all that apply.   |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Fly tipping  |                          | <input type="checkbox"/> Wild or domestic animal grazing                           |                          | <input type="checkbox"/> Off-road bike, motorcycle or car use   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Small scale domestic tipping   |                          | <input type="checkbox"/> Cutting or mowing   |                          | <input type="checkbox"/> Foot traffic   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Bulldozing or other clearance  |                          | <input type="checkbox"/> Fire  |                          | <input type="checkbox"/> None   |                          |   |                          |  |                          |  |                          |   |  |  |  |
| <input type="checkbox"/> Other (please describe)  |                          |  |                          |   |                          |   |                          |  |                          |  |                          |   |  |  |  |

The survey results can be entered into the Open Mosaic Habitat survey website (<http://habitatsurveys.no-ip.org/>). The site should be regarded as OMH if it fulfils each of the following criteria:

- Its area is at least 0.25 ha
- It contains 'Bare ground' or 'Sparse vegetation' with at least one other vegetation type in the 'Early successional vegetation', 'Grassland', 'Herb dominated' or 'Heathland' groups (see Q18)
- It has a history of disturbance or past use (see Q10)

The survey handbook contains further details of other surveys that can be used to explore the quality of OMH sites.

## OPEN MOSAIC HABITAT ASSESSMENT FORM

Do not write outside of the grey areas

Site ID:  

Page 2

| VEGETATION  |   |  |                          |                          |                          |                          |                                   |                          |
|---|---|--|--------------------------|--------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|
| <b>Q18 How much of the site is covered by the following habitats and vegetation types. Tick one box for each habitat or vegetation type present, excluding the larger water features recorded above.</b>  |   |  |                          |                          |                          |                          |                                   |                          |
|   |   | Up to 10%  | >10% to 25%              | >25% to 50%              | >50% to 100%             |                          |                                   |                          |
| Early successional vegetation   | Bare ground                                       | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Sparse vegetation                                 | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Stress tolerant annuals                           | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Moss or liverwort communities                     | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Lichen communities                                | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
| Grassland   | Other pioneer vegetation                          | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Acid  | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Neutral   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Rank neutral                                      | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
| Herb dominated  | Calcareous  | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Tall herb   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
| Heathland   | Creeping herb                                     | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Dwarf shrub                                       | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
| Woodland and scrub  | Lichen/bryophyte heath                            | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Scrub   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Scattered trees                                   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
| Wetland   | Woodland (greater than 20% canopy cover)          | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Marshy grassland                                  | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Inundation vegetation or seasonally wet areas     | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Saline/brackish seasonally wet areas              | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
| Water features  | Swamp, fen or bog                                 | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Pools (less than 25 m <sup>2</sup> )              | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Ponds (25 m <sup>2</sup> to 2 ha)                 | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   | Temporary pools                                   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                                   |                          |
|   |   |  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                   |                          |
| <b>Q19 Rank the abundance of the following vegetation structural elements on the DAFOR scale.</b><br>DAFOR scale: D - Dominant; A - Abundant; F - Frequent; O - Occasional; R - Rare; N - None.   |   |  |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Grass tussocks   | <input type="checkbox"/> Dead stems or seed heads | <input type="checkbox"/> Prostrate bramble           |                          |                          |                          |                          |                                   |                          |
| <b>Q20 What is the average number of the following per square metre. Consider dead vegetation, stems and seed heads as well as living plants and flowers. Provide approximate figures for each or tick the 'Not assessed' box. Space is provided to record from up to five areas to improve accuracy. Nectaring plants are flowers that provide valuable nectar or pollen resources and are recorded whether or not they are in flower.</b> |   |  |                          |                          |                          |                          |                                   |                          |
|   |   | 1  | 2                        | 3                        | 4                        | 5                        | Average number per m <sup>2</sup> | Not assessed             |
| All plant species   |   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>          | <input type="checkbox"/> |
| Species of nectaring plant  |   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>          | <input type="checkbox"/> |
| Individual nectaring plants   |   | <input type="checkbox"/>                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>          | <input type="checkbox"/> |
| <b>Q21 Rank the abundance of the following plants on the DAFOR scale.</b><br>DAFOR scale: D - Dominant; A - Abundant; F - Frequent; O - Occasional; R - Rare.   |   |  |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Daisy family   | <input type="checkbox"/> Pea family               | <input type="checkbox"/> St. John's worts            |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> White  | <input type="checkbox"/> Clovers                  | <input type="checkbox"/> Stonecrops                  |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Mayweeds   | <input type="checkbox"/> Bird's-foot trefoils     | <input type="checkbox"/> Teasel                      |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Oxeye daisy  | <input type="checkbox"/> Vetches                  | <input type="checkbox"/> Valerian                    |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Purple and blue  | <input type="checkbox"/> Gorse                    | <input type="checkbox"/> Weld and mignonette         |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Thistles   | <input type="checkbox"/> Yellow and white umbels  | <input type="checkbox"/> White bryony                |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Knapweeds and cornflowers  | <input type="checkbox"/> Wild carrot              | <input type="checkbox"/> Blackthorn and hawthorn     |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Yellow and orange  | <input type="checkbox"/> Borage family            | <input type="checkbox"/> Sallow                      |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Mugwort and wormwood   | <input type="checkbox"/> Viper's bugloss          | <input type="checkbox"/> Bracken                     |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Ragwort  | <input type="checkbox"/> Yellow crucifers         | <input type="checkbox"/> Nettles                     |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Fleabanes (yellow, blue & white)   | <input type="checkbox"/> Annual mercury           | <input type="checkbox"/> Sycamore                    |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Figwort family   | <input type="checkbox"/> Crane's-bills            | <input type="checkbox"/> Invasive non-native species |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Toadflaxes   | <input type="checkbox"/> Mallows                  | <input type="checkbox"/> Buddleja                    |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Mulleins   | <input type="checkbox"/> Pinks                    | <input type="checkbox"/> Japanese knotweed           |                          |                          |                          |                          |                                   |                          |
| <input type="checkbox"/> Mint family  | <input type="checkbox"/> Scabious                 |  |                          |                          |                          |                          |                                   |                          |

Do not write outside of the grey areas

Site ID:

Page 3


**Q22 Target notes.** The following space can be used to make notes related to numbered target notes on the map. Continue on another sheet if necessary. See survey handbook for further guidance.

| Target note no. | Description |
|-----------------|-------------|
|-----------------|-------------|

[illegible]

Q23 The following box can be used to make notes on the site. The notes can cover:

- A description of the site
- Other Biodiversity Action Plan habitats present
- The presence or abundance of notable species
- Clarifications of things recorded elsewhere on the form
- The age and development of the site
- Ownership and management
- Public access, legal or otherwise
- Threats



## OPEN MOSAIC HABITAT ASSESSMENT FORM

Do not write outside of the grey areas

Site ID:

Page 4

**PLANT SPECIES—OPTIONAL**

**Q24 Plants.** The following space can be used to record the presence and frequencies of plants seen during the survey. Frequencies should be recorded using the DAFOR scale: D - Dominant; LD - Locally dominant; A - Abundant; LA - Locally abundant; F - Frequent; LF - Locally frequent; O - Occasional; R - Rare; N - None. Continue on another sheet if necessary.

[illegible]

## Appendix B Example completed form

The following is an example of a completed form, adapted from an actual survey of an OMH site with high invertebrate interest.

| OPEN MOSAIC HABITAT ASSESSMENT FORM   |                                     |                                     |                                     |                             |   |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-----------------------------|---|
| Do not write outside of the grey areas  |                                     |                                     |                                     | Page 1                      |   |
| <b>GENERAL INFORMATION</b>  |                                     |                                     |                                     |                             |   |
| Q1 Site name:   | A B C D E F G                       |                                     |                                     | Q2 OS grid reference:       | 8 0 1 2 3 4 5 6   |
| Q3 Site ID:   | 0102:1234567                        |                                     | Q4 Date:                            | 14/08/2012                  |   |
| Q6 Surveyor:  | A. S. L. V. E. R. G. E.             |                                     |                                     | Q5 Is a site map available? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
|   |                                     |                                     |                                     | Q7 Time on site (hours):    | 3.5   |
| Q8 I confirm that I have reviewed the site against the generic risk assessment for OMH survey and identified any additional risks.  |                                     |                                     |                                     |                             |   |
| Initial: A S Note any additional risks:   |                                     |                                     |                                     |                             |   |
| Q9 Which best describes the survey access to the site? Tick all that apply.   |                                     |                                     |                                     |                             |   |
| <input checked="" type="checkbox"/> Full access to the whole site <input type="checkbox"/> From public right of way <input type="checkbox"/> Viewed from site boundary <input type="checkbox"/> Viewed from a distance<br><input type="checkbox"/> Full access to part of the site <input type="checkbox"/> Other (describe)  |                                     |                                     |                                     |                             |   |
| Q10 Which of the following describe the site? Tick all that apply.  |                                     |                                     |                                     |                             |   |
| <input type="checkbox"/> Known history of disturbance <input checked="" type="checkbox"/> Severely modified by previous use <input checked="" type="checkbox"/> Extraneous materials or substrates added<br><input type="checkbox"/> No history of disturbance or past use <input type="checkbox"/> Other (describe)  |                                     |                                     |                                     |                             |   |
| Q11 How old is the site? The number of years that the overall habitat has had to develop should be estimated if this is not known. Tick one.  |                                     |                                     |                                     |                             |   |
| <input type="checkbox"/> Less than 5 years <input checked="" type="checkbox"/> 10 to 19 years <input type="checkbox"/> Unknown<br><input type="checkbox"/> 5 to 9 years <input type="checkbox"/> 20 years or more   |                                     |                                     |                                     |                             |   |
| Q12 What other habitats and land use are within the surrounding landscape? Please check aerial photography and other information sources, in addition to investigating the surrounding area during the site visit. Tick one box for each habitat or land use.   |                                     |                                     |                                     |                             |   |
|   | Adjacent                            | Within 2 km                         | Within 10 km                        |                             | Adjacent  |
| Brownfield  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Hedgerows                   | <input type="checkbox"/>  |
| Unimproved grassland  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | Ditches                     | <input type="checkbox"/>  |
| Improved grassland  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Quarry                      | <input type="checkbox"/>  |
| Arable farmland   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Railway                     | <input type="checkbox"/>  |
| Wetland   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Industry or housing         | <input checked="" type="checkbox"/>                                 |
| Heath or moorland   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | Other (describe)            | <input type="checkbox"/>  |
| Scrub   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | CANAL                       | <input type="checkbox"/>  |
| Woodland  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                             | <input type="checkbox"/>  |
| Coastal habitats  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |                             | <input type="checkbox"/>  |
| <b>SITE DESCRIPTION</b>   |                                     |                                     |                                     |                             |   |
| Q13 What is the overall aspect of the site? Tick one.   |                                     |                                     |                                     |                             |   |
| <input type="checkbox"/> South facing <input type="checkbox"/> North facing <input type="checkbox"/> East facing <input type="checkbox"/> West facing <input checked="" type="checkbox"/> Level <input type="checkbox"/> None dominant  |                                     |                                     |                                     |                             |   |
| Q14 What is the topography of the site like? Tick all that apply.   |                                     |                                     |                                     |                             |   |
| <input checked="" type="checkbox"/> Flat ground <input type="checkbox"/> Slopes and banks <input type="checkbox"/> South facing <input type="checkbox"/> North facing <input type="checkbox"/> East facing <input type="checkbox"/> West facing<br><input checked="" type="checkbox"/> Hollows <input type="checkbox"/> Cliffs <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/><br><input checked="" type="checkbox"/> Mounds <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>           |                                     |                                     |                                     |                             |   |
| Q15 Are any of the following substrates are present? Tick all that apply.   |                                     |                                     |                                     |                             |   |
| <input checked="" type="checkbox"/> Original soil <input checked="" type="checkbox"/> Rubble <input type="checkbox"/> Chemical wastes <input type="checkbox"/> Blast furnace slag<br><input type="checkbox"/> Dumped topsoil <input type="checkbox"/> Brick <input type="checkbox"/> Colliery spoils <input type="checkbox"/> Other (please specify)<br><input type="checkbox"/> Sand <input checked="" type="checkbox"/> Concrete/tarmac <input type="checkbox"/> Pulverised Fuel Ash (PFA)<br><input checked="" type="checkbox"/> Stones <input type="checkbox"/> Quarry spoil <input type="checkbox"/> Leblanc waste |                                     |                                     |                                     |                             |   |
| Q16 Are any of the following water features present? Tick all that apply.   |                                     |                                     |                                     |                             |   |
| <input type="checkbox"/> River <input type="checkbox"/> Freshwater ditch <input type="checkbox"/> Dry ditch <input checked="" type="checkbox"/> Other (please describe)<br><input type="checkbox"/> Stream <input type="checkbox"/> Saline or brackish ditch <input type="checkbox"/> Lake (greater than 2 ha)    CANAL ON S BOUNDARY   |                                     |                                     |                                     |                             |   |
| Q17 Are any of the following activities currently or recently occurring on the site? Tick all that apply.   |                                     |                                     |                                     |                             |   |
| <input checked="" type="checkbox"/> Fly tipping <input checked="" type="checkbox"/> Wild or domestic animal grazing <input checked="" type="checkbox"/> Off-road bike, motorcycle or car use<br><input checked="" type="checkbox"/> Small scale domestic tipping <input type="checkbox"/> Cutting or mowing <input type="checkbox"/> Foot traffic<br><input type="checkbox"/> Bulldozing or other clearance <input checked="" type="checkbox"/> Fire <input type="checkbox"/> None<br><input type="checkbox"/> Other (please describe)  |                                     |                                     |                                     |                             |   |



## OPEN MOSAIC HABITAT ASSESSMENT FORM

Do not write outside of the grey areas

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## VEGETATION

**Q189** How much of the site is covered by the following habitats and vegetation types. Tick one box for each habitat or vegetation type present, excluding the larger water features recorded above.

|                               |   | Up to 10%                | >10% to 25%                         | >25% to 50%                         | >50% to 100%             |
|-------------------------------|---|--------------------------|-------------------------------------|-------------------------------------|--------------------------|
| Early successional vegetation | Bare ground                                   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Sparse vegetation                             | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Stress tolerant annuals                       | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Moss or liverwort communities                 | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Lichen communities                            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Grassland                     | Other pioneer vegetation                      | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Acid  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Neutral                                       | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|                               | Rank neutral                                  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Herb dominated                | Calcareous                                    | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Tall herb                                     | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Heathland                     | Creeping herb                                 | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Dwarf shrub                                   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Woodland and scrub            | Lichen/bryophyte heath                        | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Scrub   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Wetland                       | Scattered trees                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Woodland (greater than 20% canopy cover)      | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Water features                | Marshy grassland                              | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Inundation vegetation or seasonally wet areas | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Saline/brackish seasonally wet areas          | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Swamp, fen or bog                             | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Pools (less than 25 m <sup>2</sup> )          | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Ponds (25 m <sup>2</sup> to 2 ha)             | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
|                               | Temporary pools                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |

**Q19** Rank the abundance of the following vegetation structural elements on the DAFOR scale.

DAFOR scale: D - Dominant; A - Abundant; F - Frequent; O - Occasional; R - Rare; N - None.

☐ Grass tussocks ☐ Dead stems or seed heads ☐ Prostrate bramble

**Q20** What is the average number of the following per square metre. Consider dead vegetation, stems and seed heads as well as living plants and flowers. Provide approximate figures for each or tick the 'Not assessed' box. Space is provided to record from up to five areas to improve accuracy. Nectaring plants are flowers that provide valuable nectar or pollen resources and are recorded whether or not they are in flower.

|                             | 1  | 2  | 3  | 4  | 5 | Average number per m <sup>2</sup> | Not assessed             |
|-----------------------------|----|----|----|----|---|-----------------------------------|--------------------------|
| All plant species           | 13 | 6  | 6  | 4  |   | 7                                 | <input type="checkbox"/> |
| Species of nectaring plant  | 7  | 4  | 4  | 1  |   | 4                                 | <input type="checkbox"/> |
| Individual nectaring plants | 30 | 15 | 25 | 10 |   | 20                                | <input type="checkbox"/> |

**Q21** Rank the abundance of the following plants on the DAFOR scale.

DAFOR scale: D - Dominant; A - Abundant; F - Frequent; O - Occasional; R - Rare.

|   |  |  |
|---|--|--|
| <input type="checkbox"/> Daisy family                     | <input type="checkbox"/> Pea family                      | <input type="checkbox"/> Pinks                       |
| <input checked="" type="checkbox"/> White                 | <input checked="" type="checkbox"/> Clovers              | <input type="checkbox"/> Scabious                    |
| <input type="checkbox"/> Mayweeds                         | <input checked="" type="checkbox"/> Bird's-foot trefoils | <input type="checkbox"/> St. John's worts            |
| <input type="checkbox"/> Oxeye daisy                      | <input type="checkbox"/> Vetches                         | <input type="checkbox"/> Stonecrops                  |
| <input type="checkbox"/> Purple and blue                  | <input type="checkbox"/> Gorse                           | <input type="checkbox"/> Teasel                      |
| <input type="checkbox"/> Thistles                         | <input type="checkbox"/> Yellow and white umbels         | <input type="checkbox"/> Valerian                    |
| <input type="checkbox"/> Knapweeds and cornflowers        | <input type="checkbox"/> Wild carrot                     | <input type="checkbox"/> Weld and mignonette         |
| <input type="checkbox"/> Yellow and orange                | <input type="checkbox"/> Borage family                   | <input type="checkbox"/> White bryony                |
| <input type="checkbox"/> Mugwort and wormwood             | <input type="checkbox"/> Viper's bugloss                 | <input type="checkbox"/> Bracken                     |
| <input type="checkbox"/> Ragwort                          | <input type="checkbox"/> Mint family                     | <input type="checkbox"/> Nettles                     |
| <input type="checkbox"/> Fleabanes (yellow, blue & white) | <input type="checkbox"/> Yellow crucifers                | <input type="checkbox"/> Sycamore                    |
| <input type="checkbox"/> Figwort family                   | <input type="checkbox"/> Annual mercury                  | <input type="checkbox"/> Invasive non-native species |
| <input type="checkbox"/> Toadflaxes                       | <input type="checkbox"/> Crane's-bills                   | <input type="checkbox"/> Buddleja                    |
| <input type="checkbox"/> Mulleins                         | <input type="checkbox"/> Mallows                         | <input type="checkbox"/> Japanese knotweed           |

Do not write outside of the grey areas

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**Q22 Target notes.** The following space can be used to make notes related to numbered target notes on the map. Continue on another sheet if necessary. See survey handbook for further guidance.

[illegible]

- A description of the site
- Other Biodiversity Action Plan habitats present
- The presence or abundance of notable species
- Clarifications of things recorded elsewhere on the form
- The age and development of the site
- Ownership and management
- Public access, legal or otherwise
- Threats

## OPEN MOSAIC HABITAT ASSESSMENT FORM

Do not write outside of the grey areas

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## PLANT SPECIES—OPTIONAL

Q24 Plants. The following space can be used to record the presence and frequencies of plants seen during the survey. Frequencies should be recorded using the DAFOR scale: D - Dominant; LD - Locally dominant; A - Abundant; LA - Locally abundant; F - Frequent; LF - Locally frequent; O - Occasional; R - Rare; N - None. Continue on another sheet if necessary.

| Species                  | Freq. | Species                  | Freq. | Species | Freq. |
|--------------------------|-------|--------------------------|-------|---------|-------|
| BITING STONECROP         | R     | TALIFOLIUM ALVENSE       | O     |         |       |
| PETTY SPURGE             | R     | CAREX CAPITATUS          | R     |         |       |
| RED BARTSIA              | O     | LEUCANTHEMUM VULGARE     | O     |         |       |
| BLUE FLORIBAND           | O     | BELLIS PERENNIS          | A     |         |       |
| CANADIAN FLEABANE        | R     | CELESTIUM FORTINUM       | F     |         |       |
| BLACK KNAPWEED           | O     | PILOSELLA ADAMANTICUM    | R     |         |       |
| BLOODEY CAMPION          | R     | CAMPANULA PERSICIFOLIA   | R     |         |       |
| DOVE-FOOT CRANES-BILL    | R     | GALIUM MOSCUCO           | R     |         |       |
| BLACK HEDICK             | R     | PAPAVER RHOEAS           | R     |         |       |
| FALSE OX GRASS           | A     | PHYLLITIS SCLOPENDINGIUM | R     |         |       |
| COMMON CATS-TAIL         | R     | PAUNUS LAMOCERASUS       | R     |         |       |
| COMMON ARROW-ROOT        | O     | SAXIFRAGA                | R     |         |       |
| ANNUAL MARROW-GRASS      | R     | ALFALFA INCANA           | R     |         |       |
| MILK MAINT               | R     | MELILLOTUS ALBUS         | R     |         |       |
| CORONAROTEL              | R     | LATHYRUS PLATENSIS       | O     |         |       |
| COMMON FLOOM             | R     | SAXIFRAGA                | R     |         |       |
| SILVER RICE              | R     | LAMIUM ALBUM             | R     |         |       |
| ASPER                    | R     | MALVA SYLVESTRIS         | R     |         |       |
| TARSEL                   | R     | SYMPHORICARPOS ALBUS     | R     |         |       |
| HORNWORM                 | O     | ACROSTIS STOLONIFERA     | F     |         |       |
| WOOD ALBANS              | R     | AEGOPodium PODAGRARIA    | R     |         |       |
| CLAYERS                  | O     | PILOSELLA OFFICINALE     | R     |         |       |
| ROSE                     | R     | ECHEM VULGARE            | R     |         |       |
| GOATS BEARD              | R     |                          |       |         |       |
| TANSY                    | R     |                          |       |         |       |
| BROAD-LEAVED DOCK        | O     |                          |       |         |       |
| HEDGE BINDWEED           | R     |                          |       |         |       |
| REED CANARY-GRASS        | R     |                          |       |         |       |
| ROSEMARY WILLOWHERB      | R     |                          |       |         |       |
| WILD PARSNIP             | R     |                          |       |         |       |
| SPRING THISTLE           | O     |                          |       |         |       |
| PERENNIAL RYE-GRASS      | A     |                          |       |         |       |
| CREeping CINQUEFOIL      | O     |                          |       |         |       |
| RED CLOVER               | F     |                          |       |         |       |
| ARROW-ROOT PLANTAIN      | O     |                          |       |         |       |
| RED FESCUE               | F     |                          |       |         |       |
| TALL MAULOT              | R     |                          |       |         |       |
| YORKSHIRE FOG            | F     |                          |       |         |       |
| COMMON BROAD-FOOT-LEAF   | F     |                          |       |         |       |
| DAWDELION                | O     |                          |       |         |       |
| LESSER TREFOIL           | F     |                          |       |         |       |
| YARROW                   | F     |                          |       |         |       |
| PORPHYRE ST. JOHN'S-WORT | O     |                          |       |         |       |

## **Appendix C    Open Mosaic Habitat survey generic Risk Assessment**

### **C.1 Introduction**

The risk assessment below is provided as a guide to assist surveyors to assess and mitigate the effects of any hazards they may encounter whilst surveying. The risk assessment is not exhaustive and surveyors are responsible for identifying and dealing with any hazards that have not been included. They are also responsible for the interpretation of the risk assessment in the context of the prevailing local circumstances. The assessment indicates that any risks posed by the identified hazards may be mitigated by adherence to the guidance provided. A copy of the risk assessment and the associated guidance is provided below.

### **C.2 General advice**

- Always let someone know where you are going and when you expect to return.
- Prior to visiting the site, seek advice from the landowner on any hidden dangers, such as contamination or unstable ground.
- Upon arrival at the site, you should make an assessment of the visible risks on the site, noting any that are not covered by this risk assessment.
- Take a mobile phone and a whistle with you.
- Plan escape routes – particularly if you are working in a remote area.
- Always wear clothing and footwear appropriate to the terrain, the weather and the season.
- Take spare clothing and an emergency blanket/survival blanket if working in remote areas.
- Ensure that you have sufficient food and water – including a small reserve in case of emergencies.
- Always carry a small first-aid kit.
- Obtain an up-to-date weather forecast before setting out.
- Remember that the weather can change quickly.
- Beware of domestic and farm animals.
- Take care when approaching or walking along the highway – especially trunk and other A roads – wear an appropriate high visibility jacket.
- Park carefully, so as not to cause a hazard.
- Avoid confrontation.

### **C.3 Risk Assessment**

| <b>Hazard Title</b>                                 | <b>Ref</b> | <b>A</b> | <b>B</b> | <b>C</b> | <b>Risk Rating</b> |
|---|------------|----------|----------|----------|--------------------|
| Quarries, mines and mineral waste tips              | H1         | 4        | 3        | 5        | 12 <sup>2</sup>    |
| Fly-tipping of refuse, toxic materials and 'sharps' | H2         | 4        | 3        | 5        | 12 <sup>2</sup>    |
| Ground conditions                                   | H3         | 2        | 4        | 3        | 9                  |
| Cliffs  | H4         | 3        | 2        | 5        | 10                 |
| Steep slope   | H5         | 4        | 3        | 4        | 11                 |
| Water   | H6         | 3        | 2        | 5        | 10                 |
| People  | H7         | 4        | 1        | 5        | 10                 |

<sup>2</sup> Note that certain sites may have particular conditions that increase the risks associated with these hazards. Such sites must be assessed individually, seeking advice from the landowner or other party with knowledge of the risks.

| Hazard Title   | Ref | A | B | C | Risk Rating |
|--|-----|---|---|---|-------------|
| Vehicles   | H8  | 4 | 1 | 5 | 10          |
| Agricultural machinery   | H9  | 1 | 2 | 4 | 7           |
| Dogs   | H10 | 3 | 3 | 4 | 10          |
| Wild animals   | H11 | 1 | 1 | 3 | 5           |
| Insects  | H12 | 3 | 3 | 5 | 11          |
| Ticks  | H13 | 2 | 4 | 4 | 10          |
| Rats   | H14 | 2 | 2 | 4 | 8           |
| Snakes   | H15 | 2 | 2 | 2 | 6           |
| Irritant and dangerous plants  | H16 | 1 | 3 | 5 | 9           |
| Invasive species and diseases  | H17 | 4 | 3 | 0 | 7           |
| Farm animals   | H18 | 1 | 2 | 5 | 8           |
| Hedges, fences, walls, gates and stiles  | H19 | 4 | 2 | 3 | 9           |
| Electric fences  | H20 | 2 | 3 | 1 | 6           |
| Crops  | H21 | 2 | 1 | 3 | 6           |
| Pollen and dust  | H22 | 4 | 3 | 1 | 8           |
| Hot sun, extreme heat and high humidity  | H23 | 3 | 3 | 2 | 8           |
| Lightning  | H24 | 1 | 1 | 5 | 7           |
| Dense fog and mists  | H25 | 1 | 2 | 5 | 8           |
| Heavy rain   | H26 | 3 | 3 | 3 | 9           |
| Strong winds   | H27 | 2 | 2 | 5 | 9           |
| Risk Rating: 1 to 7 - No specific measures. 8 to 12 - Risk mitigation measures required. 13 to 15 - Significant risk mitigation measures required. |     |   |   |   |             |

#### C.4 Risk Assessment key

|   |  |                       |  |
|---|--|-----------------------|--|
| A.  | The likely frequency of exposure to each hazard, should be assessed against this scale.                                | 1<br>2<br>3<br>4<br>5 | Very infrequent<br>Infrequent<br>Frequent<br>Very Frequent<br>Constant   |
| B.  | The likelihood of the potential danger becoming a reality, should be assessed against this scale.                      | 1<br>2<br>3<br>4<br>5 | Unlikely<br>Low possibility<br>Possible<br>Probable<br>Near certainty  |
| C.  | The most serious likely consequence of the potential danger becoming a reality, should be assessed against this scale. | 1<br>2<br>3<br>4<br>5 | Minor injury or illness<br>Injury requiring medical attention<br>Injury or illness resulting in absence in excess of 3 days<br>Serious injury or long-term sickness<br>Fatal |
| A + B + C will give a risk rating – the higher risks having the higher rating numbers. Where necessary to prepare safe working practices, or to devote resources to measures to reduce the likelihood or seriousness of the effects of the risk, higher rated risks should take priority. |  |                       |  |

## C.5 Hazards

### Quarries, mines and mineral waste tips

Quarries, mines and mineral waste tips are potentially very dangerous places. They give rise to a large number of different hazards, including uneven and unstable ground conditions, concealed shafts, heavy machinery and plant, steep rock faces and falling debris. In addition there are potential dangers on active sites associated with blasting, dust inhalation, noise, chemicals and hot materials such as bitumen.

Many of the sites surveyed for OMH will be inactive quarries, mines and mineral tips. Some may be extremely dangerous, whilst other may have been landscaped, thus reducing the risk. Some may also be adjacent to still active sites.

Measures to reduce the risk:

- Wear high visibility clothing, safety hat and safety footwear if appropriate.
- Inform Quarry/Mine Manager of your presence on site if appropriate.
- Keep well clear of all vehicles, plant and machinery.
- Keep well clear of quarry faces, excavations, lagoons and other areas where mining/quarrying operations are taking place.
- Wear face mask if it is necessary to enter an area where dust is present in the air.

Measures to reduce the effect:

- Seek immediate medical attention for injuries or when material volumes of dust or fumes have been inhaled.

### Fly-tipping of refuse, toxic materials and 'sharps'

In recent years, fly-tipping has become a growing problem. Increased charges at licensed disposal sites, strict controls on the disposal of certain types of waste and in some cases the distance which must be travelled to authorised, domestic waste disposal facilities have all encouraged the irresponsible, illegal and clandestine tipping of waste in the countryside. Refuse may include some hazardous materials, such as metal, glass, chemicals and medical waste, including discarded syringes. This is likely to be a particular problem in urban or urban fringe OMH sites.

In addition, some OMH sites are heavily contaminated with toxic materials, due to their previous industrial uses. Such waste can be extremely wide ranging, from materials that are unlikely to pose a health risk to those that are extremely dangerous. Even on remediated sites there may be buried hazardous materials. It is not possible to give details of all the potential hazards that may be encountered, so advice should be sought on a case-by-case basis.

Measures to reduce the risk:

- Wear stout boots and gaiters.
- Seek advice from the owners regarding any contamination, the risks it may pose and additional mitigation required.
- Do not disturb obvious waste – inform the local authority responsible for environmental cleansing or the Environment Agency of the existence of fly-tipping.
- Do not touch or dig in the soil unless you are sure it poses no health risk.

#### Measures to reduce the effect:

- Seek immediate medical attention for any cuts, following the inhalation of toxic fumes or if you start to feel unwell after visiting a site.
- Seek advice from the landowner if you come into contact with anything that you think might be contaminated.
- Also see Water and Rats – in relation to water which may be contaminated.

#### Ground conditions

Poor ground conditions are an ever-present feature of the countryside. Such conditions include deep ruts caused by vehicles, animals and water run-off, boulders, large stones and other debris on or near the surface, concealed culverts, puddles and other small areas of standing water, soft ground and boggy areas, unstable soil structures, including thixotropic mud, quicksand and thick weed growth.

#### Measures to reduce the risk:

- Avoid dangerous areas and choose the safest possible routes over ground that is in a poor condition.
- Wear stout boots with good ankle support and well-treaded soles.
- Wear appropriate protective clothing.

#### Measures to reduce the effect:

- Seek medical treatment for any serious cuts, bruises or strains.
- See also Water – in relation to immersion in water that may be contaminated.

#### Cliffs

Working both above and below cliffs can present a hazard. Cliff edges may be hidden, especially in woodland or scrub, increasing the risk of falls. Cliff edges are also often unstable, so the risk of a fall is present even when the drop can be avoided. When working beneath cliffs there is a particular risk of falling material and landslides.

#### Measures to reduce the risk:

- Avoid working near cliffs.
- Be vigilant for cliff edges. If working in an area where cliffs are likely do not rush.

#### Measures to reduce the effect:

- Wear appropriate safety clothing if necessary, including safety helmet.
- See also Quarries, mines and mineral waste tips.

#### Steep slope

Some OMH sites are likely to include steep slopes. Most steep slopes will be due to artificial build-up of waste from previous industry or extraction of material from the ground to create pits and quarries. Such slopes may be unstable if the substrate is loose or has not properly settled, and may cause dangerous landslides underfoot. Even slopes that would present no issues in dry conditions may become very dangerous when wet.

#### Measures to reduce the risk:

- Make an assessment of the site and completely avoid potentially dangerous slopes.
- If the slope starts to feel unsafe, stop and return to take a safer path, even if this means part of the OMH site cannot be accessed.
- Wear suitable footwear.



#### Measures to reduce the effect:

- Always ensure that your mobile phone and whistle are readily accessible in case of an emergency.
- Avoidance is the most sensible way to mitigate for this danger.
- See also Quarries, mines and mineral waste tips.

#### Water

Bodies of water can range from natural ponds and lakes containing relatively clear water of varying depth, to active silt lagoons containing murky water with a bottom of deep silt and with steep, muddy banks. Water bodies in OMH sites may also contain high levels of a wide range of contaminants that will present a risk to human health.

#### Measures to reduce the risk:

- Avoid banks that appear to be unstable.
- Assume that all standing water on OMH sites may be contaminated and avoid contact with it.
- Do not attempt to cross a potentially hazardous pond, ditch, river or stream. Find an alternative route around.
- Avoid hazardous situations and locations.

#### Measures to reduce the effect:

- Ensure warm dry clothes are available in case of accidental immersion in water.
- Also see Rats – in relation to immersion in water which may be contaminated with Leptospirosis.

#### People

People are one of the hazards most likely to be encountered on OMH sites. Many of the sites are in deprived inner-city areas, which often have low average incomes, higher levels of crime and suffer from urban decay. In addition, encounters with people during the day are more likely as they may not be in employment. Encounters with individuals will often lead to some banter, which may include mock threats. Rarely encounters will include violence or other crime.

Even when permission to survey has been obtained, there is still a small possibility of meeting hostile landowners that can occasionally escalate into violent action.

As this survey is generally carried out alone and sometimes in relatively dangerous areas, there is also a risk of assaults of all descriptions by less stable members of the community. Such attacks are unlikely to occur in full view, especially where there is a large public presence, but will be more likely where cover is available.

All assaults or threatening behaviour should be reported to the police.

#### Measures to reduce the risk:

- Tact and situation avoidance.
- Stay in open areas where you can be seen. It should not be necessary to enter scrub or woodland where potential attackers may be hiding.

#### Measures to reduce the effect:

- Keep a personal attack alarm on your person and in easy reach at all times. Whilst this may not stop an attack it may provide time to escape.
- Do not attempt to fight back in the event of a theft, as this may lead to injury.
- Keep a mobile telephone available to summon help in the case of an actual assault or an indication that an assault may be threatened.
- Seek medical attention following injury resulting from physical assault.

#### Vehicles

Vehicles are most likely to be encountered whilst travelling to an OMH survey site, from normal road vehicles whilst driving and walking to the site. There may also be encounters with recreational four-wheel drive and other off-road vehicles, including motorcycles and pedal cycles. There is also the possibility of encountering trains at level crossings over railways.

The most frequent contact with vehicles is likely on all-vehicle highways. Recreational vehicles may be encountered frequently, as there are high levels of recreational use in some OMH sites. Where recreational vehicles are most likely to occur there will often be visible signs, such as deeply rutted tracks, etc.

#### Measures to reduce the risk:

- Keep a careful lookout in areas where encounters are likely – road junctions, on by-ways, railway, airstrip crossings and areas clearly used by off-road vehicles.
- Wear high visibility clothing as appropriate.

#### Measures to reduce the effect:

- Obtain immediate medical treatment for any injuries.

#### Agricultural machinery

Although designed to comply with strict health and safety requirements, agricultural machinery is inherently dangerous because of the operations it is designed to carry out. Machinery is usually heavy and cumbersome, particularly since it is usually towed by a tractor and operated in conditions where its operators do not expect to encounter members of the public. Agricultural machinery is most likely to be encountered whilst walking to a survey site.

#### Measures to reduce the risk:

- Good observation, keep a sharp lookout at all times.
- Be aware of any spraying operations that may be in progress.
- Recognise areas where machinery may be operating and machinery that may start automatically.
- Keep well clear of all machinery, but if you do need to approach, ensure that the operator is aware of your presence before proceeding.

#### Measures to reduce the effect:

- Seek immediate medical attention for any injury or the inhalation of chemicals.

#### Dogs

Dogs will generally be in the control of their keepers and it is unlikely that they will attack an adult under these circumstances, but an unaccompanied dog should be treated with suspicion. Dog bites and scratches can cause infection. Dog attacks should be reported to the police, even where the owner cannot be identified.

#### Measures to reduce the risk:

- Wear appropriate clothing and keep a sharp lookout for loose dogs.
- Carry an ultra-sound dog deterrent such as a "dog dazer".
- Avoid physical contact with all animals.

Measures to reduce the effect:

- Seek medical attention as soon as possible after being bitten or scratched.

### Wild animals

There are many indigenous wild animals to be found in the countryside but they are mostly relatively small mammals and they pose no direct threat to humans. Most are retiring animals and it is unlikely that they will hold their ground when approached. They can, however, carry diseases and any bite or contact with their excrement could cause infection. Injured animals, no matter how small, should be treated with extreme caution.

Measures to reduce the risk:

- Keep a sharp lookout for animal movements. Avoid contact with animals and their excrement. Do not disturb their dens or interfere with their young.

Measures to reduce the effect:

- Seek medical attention for any serious injury. Keep inoculations up-to-date.

### Insects

Some of the very many insects indigenous to the United Kingdom can be harmful to health. The stings of wasps, bees and hornets may cause an allergic reaction, which can in rare cases cause death. Mosquito, midge and horse-fly bites can also result in allergic reactions, leading to irritation and discomfort. (Also see Ticks.)

Measures to reduce the risk:

- Wear long trousers (tucked into socks) and long sleeved top, to cover arms and legs.
- Take care not to disturb hives or nests and keep well clear of swarming bees.
- Do not provoke attack from bees and wasps.
- Be wary of wasps in late summer and autumn, when they can be less predictable (most wasp stings occur during this period).
- Use insect repellent at all times and in areas where insects are known to be active, particularly if you suffer severe reaction to insect bites or stings.

Measures to reduce the effect:

- Seek medical attention in cases of severe reaction.
- Carry antidote for any known, personal allergy.

### Ticks

Ticks present a special hazard in the countryside since they may carry Lyme Disease. They are tiny spider-like creatures that live in woodland, moorland and grassy areas. Ticks cling to the ends of vegetation and attach themselves to passing animals and humans. Having attached to the clothing of a human being, it may be some time before the tick makes contact with the host's skin and makes the bite that may transmit the disease. Unlike spiders, ticks press themselves close to the skin of the host as they crawl.

Lyme Disease is a bacterial infection which can affect the skin and occasionally cause serious illness of the nervous system, joints or heart, the disease may first show itself between three and thirty days after infection, as an expanding, reddish, round rash in the area of the bite.

Early symptoms may resemble influenza with swollen glands near the bite, mild headaches, aching joints and tiredness.

Measures to reduce the risk:

- Wear long trousers (tucked into socks) and long sleeved top, to cover arms and legs. Ticks can be seen more easily on light coloured clothes.
- When working in tick infested areas inspect body for ticks every few hours and if possible, at the end of the day's outdoor activity, undress and inspect body for ticks.
- Remove ticks by grasping them close to the skin with fine tweezers. Current CDC recommendations are not to twist the tick whilst pulling them out, instead pull them straight out with a slow and steady motion. Then clean your skin with soap and warm water.
- When removing, avoid crushing the tick's body. Do not be alarmed if the tick's mouthparts remain in the skin. Once the mouthparts are removed from the rest of the tick, it can no longer transmit the Lyme disease bacteria. If you accidentally crush the tick, clean your skin with soap and warm water or alcohol.

Measures to reduce the effect:

- Save any removed ticks in a jar, for later analysis if symptoms occur.
- See immediate medical advice if symptoms occur.

### Rats

Rats fall within the wild animals category but they are dealt with separately because they carry Weil's Disease (Leptospirosis). This is a serious, infectious disease which can be spread to humans through water contaminated by infected animals, particularly rats and can occur after immersion of any part of the body in infected water.

Measures to reduce the risk:

- In the right conditions the Leptospirosis bacteria can survive for a number of days after leaving the host animal and it has the potential to infect during that period.
- Avoid contact with potentially infected water, such as ponds, ditches, rivers and streams. Rather than attempting to cross a potentially hazardous water feature find a way around.
- After contact with water that may be infected, or with contaminated boots or clothing, wash affected parts of the body thoroughly with soap and water, paying particular attention to fingernails. Do not eat until you have thoroughly cleaned your hands and arms.
- Wet clothing and footwear should be thoroughly cleaned as soon as possible after use.

Measures to reduce the effect:

- If you suffer from symptoms similar to influenza (headache, fever and muscle pain; may also be mistaken for pneumonia, tonsillitis or rheumatic fever) or have other reason to suspect that you may have become infected, seek immediate medical attention and inform the doctor that you may have been in contact with contaminated rats or their excrement.

### Snakes

Adders are the only indigenous poisonous snakes in the United Kingdom. They are most likely to be encountered basking on warm lowland heaths, including coastal slopes. They may also be encountered on OMH sites. They are retiring animals and it is unlikely that they will hold their ground at the approach of humans. The bite of an adder is poisonous and medical attention should be quickly sought, but only young children are at serious risk.

The risk is slightly greater earlier in the year when snakes are more likely to be encountered 'sun-bathing' and will be more sluggish.

Measures to reduce the risk:

- Wear stout boots (with ankle protection) and gaiters to protect lower legs.
- Keep a sharp lookout, especially in the circumstances described in the notes above, to avoid stepping on or disturbing an adder.

Measures to reduce the effect:

- Remain calm
- Seek immediate medical attention.

### Irritant and dangerous plants

Plant hazards vary considerably from skin irritation caused by contact with stinging nettles and plants such as giant hogweed, to the serious, possibly fatal consequences of ingesting parts of plants such as hemlock and deadly nightshade.

Measures to reduce the risk:

- Learn to identify and avoid dangerous plants.
- Avoid ingesting any plant parts.
- Wear long trousers, long sleeved top and stout boots and gaiters when working or walking in dense vegetation.

Measures to reduce the effect:

- Seek medical attention for any unusual or suspicious symptoms after contact with vegetation.
- See also Pollen and dust.

### Invasive species and diseases

Whilst they are not generally a risk to human health, the spread of invasive non-native species and diseases that affect wild plants and animals are one of the most significant economic and environmental threats (Pimentel *et al.*, 2001). Many non-native species will occur on OMH sites, some of which may be invasive, such as Japanese knotweed *Fallopia japonica* or the harlequin ladybird *Harmonia axyridis*.

There is a risk of spreading invasive plant and animal diseases. The most prominent plant diseases affect trees and shrubs, such as *Phytophthora* and ash dieback *Chalara fraxinea*, and may spread to plants both on OMH sites and in the surrounding area. The most economically important animal diseases are those that affect livestock, such as foot and mouth disease, and may result in mandatory biosecurity measures that are most likely to affect access to OMH sites.

Measures to reduce the risk:

- Learn to identify non-native species and the signs of diseases.
- Ensure that clothes, footwear and equipment are cleaned between site visits, making sure they are thoroughly dried or disinfected.
- Follow any specific biosecurity guidance, including the use of disinfectants.
- Avoid direct contact with farm animals.
- Do not enter or cross any land known to be contaminated with a notifiable disease.

Measures to reduce the effect:

- Report any non-native invasive species or signs of disease seen to the relevant authorities.

### Farm animals

There are a number of indigenous farm animals that may be found in the countryside. They are likely to be encountered in fields and farmyards and occasionally on potential OMH sites. Horses are the most common animals likely to be encountered, but cattle, sheep, goats, pigs, chickens, geese and other fowl may be met.

Few farm animals are likely to hold their ground at the approach of humans but caution should always be exercised as the behaviour of all animals is unpredictable, particularly when they are accompanied by their young.

Extreme caution is necessary in respect of bulls, stallions, boars and rams. Increasingly, non-indigenous species are being introduced into the countryside including ostriches, water buffalo and llama. These animals are likely to be in special enclosures but they are particularly unpredictable and they should always be regarded as being potentially dangerous.

Measures to reduce the risk:

- Check with landowners for any hazards on the OMH site.
- If contact is unavoidable, avoid sudden moves and do not place yourself between a female animal and its young. Do not run or show signs of fear. Leave the animal enclosure as quickly as possible, without running.

Measures to reduce the effect:

- Seek immediate medical attention for any injuries.

### Hedges, fences, walls, gates and stiles

These features are all very common in the countryside and generally speaking, provided that they are in a reasonable state of repair, they should not pose a danger.

Measures to reduce the risk:

- Take care when climbing stiles, particularly in wet conditions.
- Take care when opening or closing gates, particularly when the gate is in a poor state of repair or is badly hung.
- Avoid climbing walls – always use gaps, stiles or gates.
- Take care when walking along paths that are bounded by vegetation or where barbed wire has been used in a fence.

Measures to reduce the effect:

- Wear stout boots with firm ankle support and appropriate protective clothing.
- Seek medical attention for any serious injuries.
- Keep anti-tetanus injections up-to-date.

### Electric fences

Electric fences are very commonly used as temporary barriers to control short-term grazing. They are being increasingly used as semi-permanent barriers, to control stock movements. They may be composed of one or more strands of thin wire or sometimes a wire mesh usually to control sheep. Whether the electricity is supplied from a battery or from the mains, a healthy adult, whilst feeling an unpleasant sensation and short-term pain, will not suffer any lasting ill-effects.

Measures to reduce the risk:

- Always assume that electric fences are “live”.
- Avoid contact. Close proximity can result in a shock in damp conditions.

Measures to reduce the effect:

- Treatment will not normally be required.

### Crops

Crops are unlikely to be encountered during OMH survey, but may be encountered on the approach to the survey site. Probably the main hazard associated with crops is the use of chemicals to control weeds and pests. The dust and pollens present with the crops at certain seasons can also constitute a hazard.

Measures to reduce the risk:

- Avoid any area being treated with pesticides or insecticides and for at least 24 hours after the application.
- Check with landowners for any hazards on the approach to the OMH site.
- See Pollen and dust.

Measures to reduce the effect:

- Thorough knowledge of the types of chemicals used in the countryside, their effect and the first aid measures to be used in the event of contamination.
- Seek immediate medical attention in the event of exposure to pesticides or insecticides.
- See Pollen and dust.

### Pollen and dust

Pollens and dust can set off attacks of hay fever or other reactions in anyone who is allergic to any of the elements present in the dust or pollen.

These are seasonal hazards with peaks during dry conditions in spring, when tree pollen is common, and in summer, when grass pollens are prevalent in the atmosphere.

Measures to reduce the risk:

- Avoiding the irritant can solve the problem but this is not always possible.
- Sensitive individuals should check pollen forecasts and consider cancelling or re-arranging outdoor work if appropriate and possible.

Measures to reduce the effect

- Seek medical advice regarding antihistamine treatments.

### Hot sun, extreme heat and high humidity

Prolonged exposure to ultraviolet rays from the sun, even through light cloud cover, can cause sunburn. High temperatures and high humidity can result in heat exhaustion. OMH sites are unlikely to provide sufficient shade to reduce these risks.

Measures to reduce the risk:

- Adjust work programme to suit extreme weather conditions.
- Avoid strenuous activity in conditions of high humidity.
- Carry plentiful supplies of water and drink frequently.
- Dress for the conditions i.e. light clothing, protecting body, arms and legs from UV rays, sunglasses.



- Use barrier cream on exposed areas of skin.

Measures to reduce the effect:

- Rest and reduce body temperature
- Obtain medical attention if required.

### Lightning

Many areas of the country are prone to isolated, local thunderstorms, particularly following spells of hot weather.

Working in open areas is risky during thunderstorms, as surveyors can be the most prominent feature in the landscape and therefore most likely to be struck. The high current from lightning can also travel along ground radially away from the lightning strike and cause lethal shocks.

Trees and shrubs should not be used as shelter during lightning storms, as lightning can boil tree sap, causing struck trees to explode and sending projectiles that could injure or kill anyone nearby. Lightning may also jump from the tree being struck to the person taking shelter there. If trees are the only form of shelter available, avoid the tallest trees by a distance of at least their height, instead sheltering under a stand of smaller trees.

Measures to reduce the risk:

- Postpone survey in thunderstorms, taking shelter in a car or building.
- Be alert for approaching storms and seek suitable shelter before they arrive.
- Avoid using radios/mobile telephones/umbrellas during thunderstorms.
- Be aware of weather forecasts and the conditions that can give rise to thunder storms.
- Avoid using any metal tools or equipment during a thunderstorm.
- If caught out by a storm in a prominent location where no suitable shelter is available, crouch down or roll into a ball to avoid being the tallest feature in the landscape.

Measures to reduce the effect:

- Seek immediate first-aid followed by urgent medical attention.

### Dense fog and mists

Dense fog and mist can reduce visibility and increase vulnerability to other hazards, predominantly in upland and coastal areas. This is unlikely to be a big problem during OMH survey.

Measures to reduce the risk:

- Take into account any extreme weather conditions or forecasts.
- Regular training and re-training in map reading skills and use of compass.

Measures to reduce the effect:

- Wear clothing appropriate to seasonal weather conditions.
- Availability of a mobile telephone to summon help.
- Carry emergency equipment (whistle, food, waterproofs).

### Heavy rain

Exposure to heavy rain can increase the risks and the adverse effects of other hazards, particularly those arising from extreme cold, strong winds and adverse ground conditions.

Measures to reduce the risk:

- Take into account extreme weather conditions.
- Dress for the conditions, i.e. warm, waterproof and wind-proof clothing and well-treaded, waterproof boots.

Measures to reduce the effect:

- Seek shelter and if necessary wait for rain to abate.

### Strong winds

Strong winds can be particularly hazardous in high, exposed areas, particularly in woodland areas where trees may be toppled and branches may fall, and also near coasts. Materials may be blown from buildings, particularly derelict buildings.

Strong winds can also increase the risk and the adverse effects of other hazards.

Measures to reduce the risk:

- Take into account extreme weather conditions. Avoid vulnerable areas.

Measures to reduce the effect:

- Wear appropriate weatherproof and safety clothing, including safety helmet.

## C.6 Lone Working Procedure

When working alone surveyors should have and implement a lone working plan that will ensure that a nominated contact(s) will be aware if they do not make a safe and timely return from each days surveying. Surveyors must also have the ability to raise an alarm / seek assistance from the field in so far as mobile phone coverage will allow.

Before starting a day's survey the surveyor should ensure that an appropriate person is aware of:

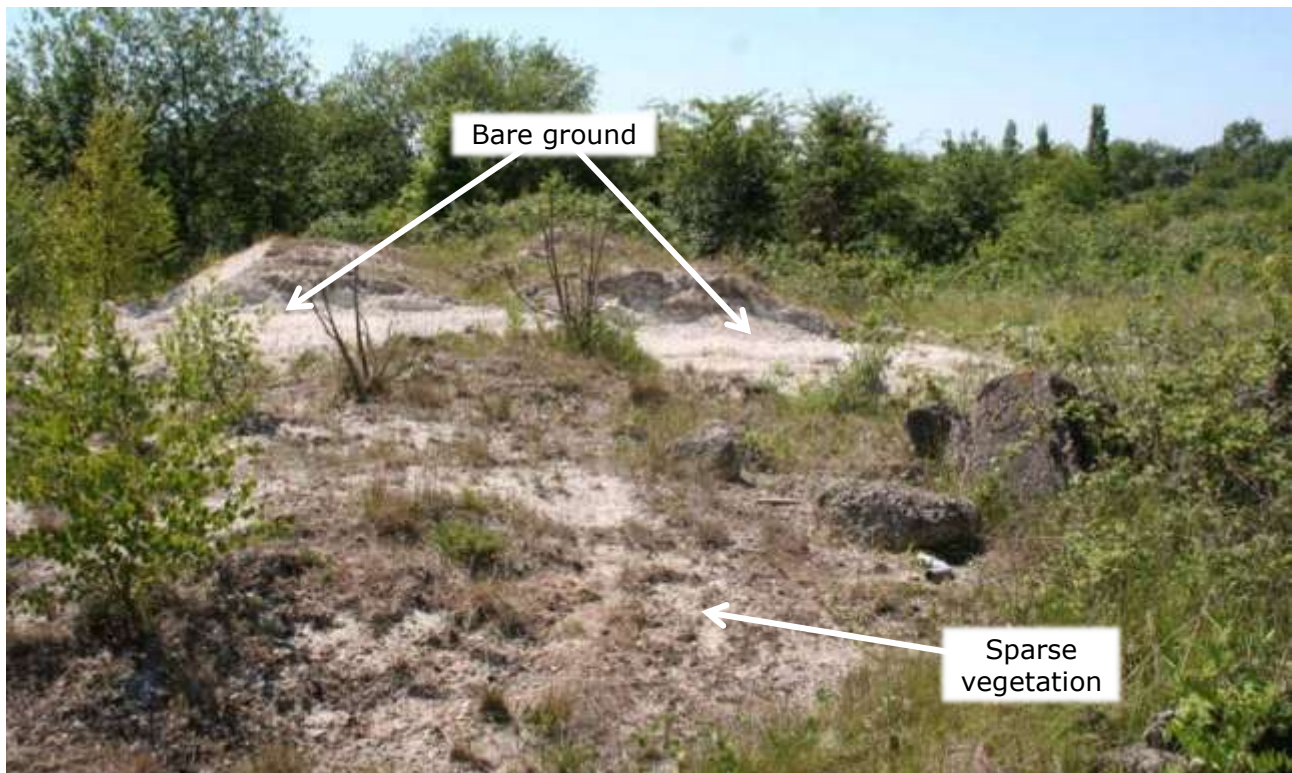
- The broad area that the surveyor will be visiting that day.
- The expected time of return.
- The procedure to follow if the surveyor does not return or otherwise make contact by the expected time of return.

## **Appendix D    Examples of habitats and vegetation types**

The following is a pictorial guide to the habitats and vegetation types recorded in the OMH survey methodology. Photographs that clearly demonstrate different habitats have been included where available, though adequate photographs were unavailable for a small number of habitats. This guide can be updated as more examples become available.

### **D.1   Early successional vegetation**

Bare ground – larger (over 50 cm by 50 cm) areas of bare ground, either soil or other substrates.



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Sparse vegetation – plants of various kinds interspersed with smaller (less than 50 cm by 50 cm) areas of bare ground. Sparse stress tolerant annuals, mosses or liverworts and lichens should be included in the following categories.



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Stress tolerant annuals – annual plants that are adapted to low nutrient availability, such as thyme-leaved sandwort *Arenaria serpyllifolia*, common centaury *Centaureum erythraea*, fairly flax *Linum catharticum* or hare's-foot clover *Trifolium arvense*. Where these occur with greater than 20% grasses they should be included in the appropriate grassland community.



The stress tolerant annuals thyme leaved sandwort *Arenaria serpyllifolia* (top), sun spurge *Euphorbia helioscopia* (bottom left) and shepherd's purse *Capsella bursa-pastoralis* (bottom right). © Steven Falk/Buglife, 2008, 2009, 2011.



Moss or liverwort communities – areas dominated by mosses or liverworts with few or no other plants, but excluding lichen and bryophyte heaths.



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Lichen communities – areas dominated by lichens with few or no other plants, but excluding lichen and bryophyte heaths.



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Other pioneer vegetation – other early successional vegetation.

*Example image unavailable.*

## D.2 Grassland – grass dominated vegetation

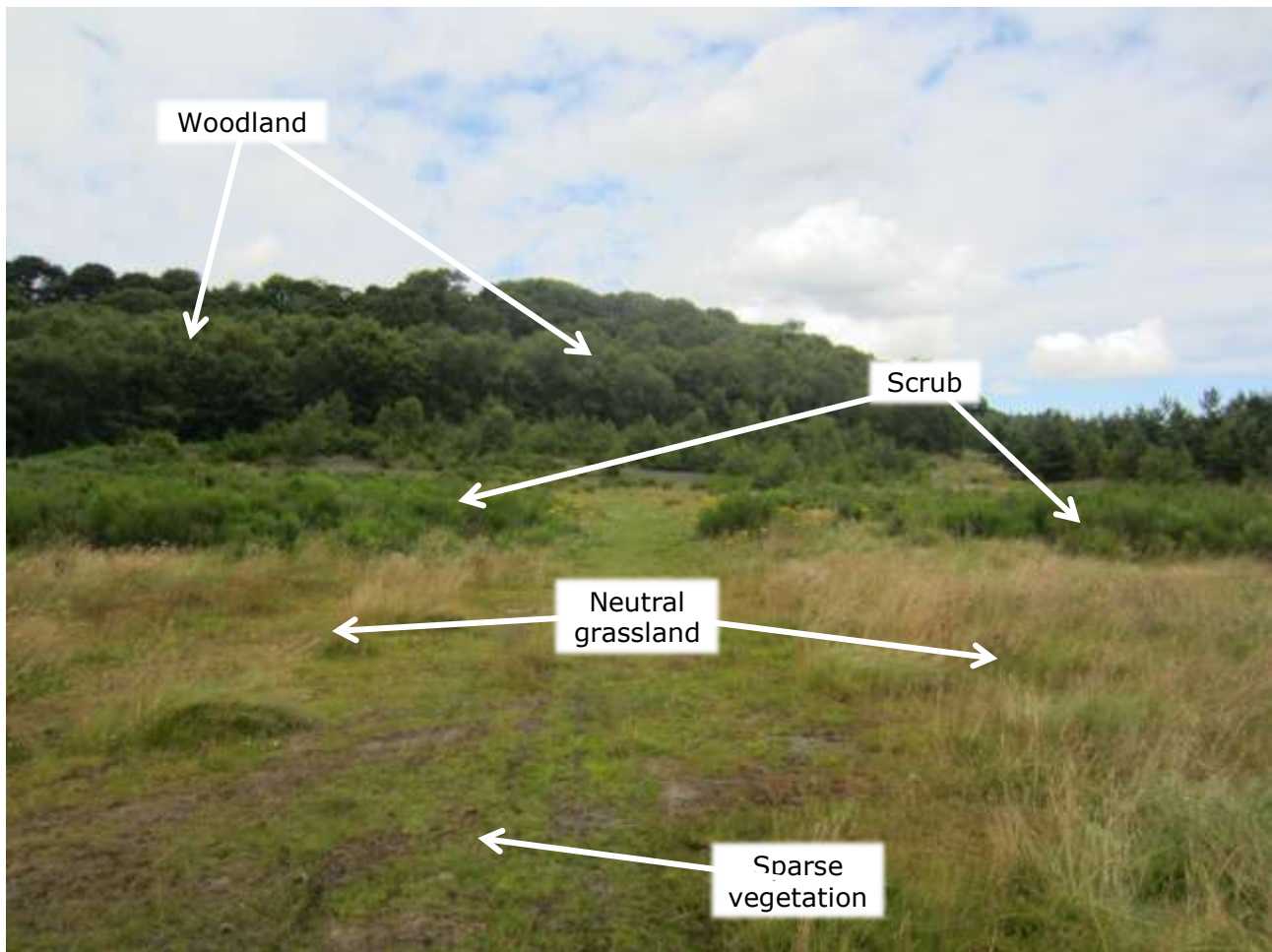
Acid – usually species poor grassland that has developed on lime-deficient substrates and is characterised by species such as heath bedstraw *Galium saxatile*, sheep's fescue *Festuca ovina*, common bent *Agrostis capillaris*, sheep's sorrel *Rumex acetosella*, sand sedge *Carex arenaria*, wavy hair-grass *Deschampsia flexuosa*, bristle bent *Agrostis curtisii*, mouse-ear hawkweed *Pilosella officinarum* and tormentil *Potentilla erecta*.



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Neutral – grassland that lack species strongly associated with acid or calcareous soils, including both short- and long-turfed grassland but excluding rank neutral grassland. Marshy neutral grassland should be recorded under marshy grassland.



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Rank neutral – tall, dense grassland dominated by coarse grasses, such as false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata*, tufted hair-grass *Deschampsia caespitosa*, Yorkshire-fog *Holcus lanatus*, wood small-reed *Calamagrostis epigejos* and common couch *Elymus repens*. It does not include tor grass *Brachypodium pinnatum* or upright brome *Bromopsis erecta* dominated areas, which should be included under calcareous grassland.



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Calcareous – species rich grassland that has developed on base-rich substrates (including PFA, Leblanc waste and blast furnace slag). It is characterised by species such as common rock-rose *Helianthemum nummularium*, carline thistle *Carlina vulgaris*, kidney vetch *Anthyllis vulneraria*, wild thyme *Thymus polytrichus*, small scabious *Scabiosa columbaria*, salad burnet *Sanguisorba minor*, fairy flax *Linum catharticum*, mouse-ear hawkweed *P. officinarum*, yellow-wort *Blackstonia perfoliata*, quaking-grass *Briza media*, sheep's fescue *F. ovina* and glaucous sedge *Carex flacca*.

*Example image unavailable.*



### D.3 Herb dominated – vegetation dominated by broad-leaved herbs

Tall herb – vegetation dominated by tall herbs, such as rosebay willowherb *Chamaenerion angustifolium*, greater willowherb *Epilobium hirsutum*, common nettle *Urtica dioica*, wild carrot *Daucus carota*, toadflaxes *Linaria* spp., mugwort or wormwood *Artemisia* spp. common fleabane *Pulicaria dysenterica* and weld *Reseda luteola*. Japanese knotweed *Fallopia japonica* should also be recorded here, as well as question 22. Where these occur with greater than 20% grass should be included in the relevant grassland community.



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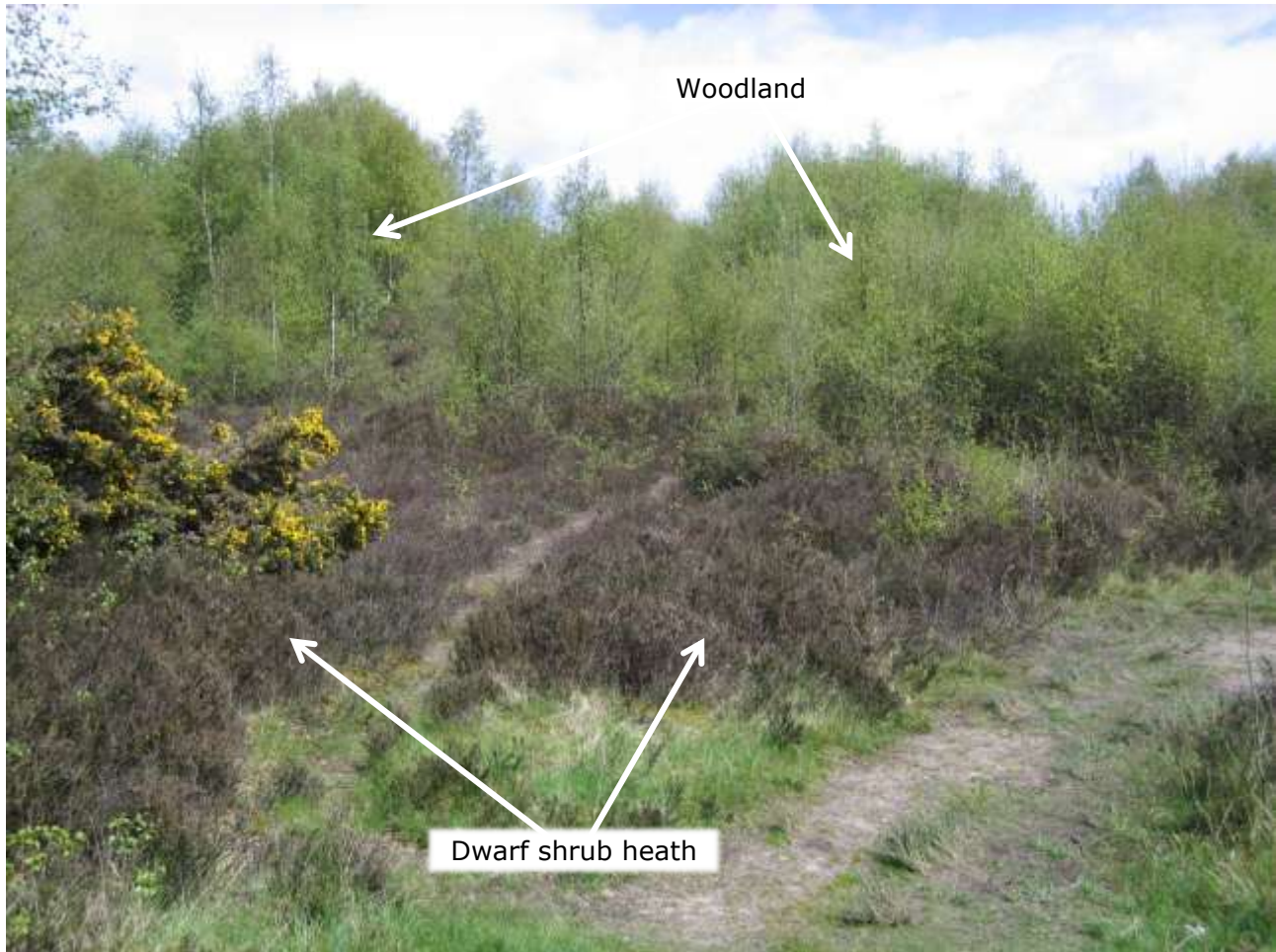
Creeping herb – low-growing herbaceous plants that spread using runners, such as creeping cinquefoil *Potentilla reptans*, creeping buttercup *Ranunculus repens*, wild strawberry *Fragaria vesca*, mouse-ear hawkweed *P. officinarum* and ground ivy *Glechoma hederacea*. Where these occur with greater than 20% grass should be included in the relevant grassland community.

*Example image unavailable.*



#### D.4 Heathland

Dwarf scrub – vegetation with at least 25% cover of ling *Calluna vulgaris*, bell heather *Erica cinerea*, cross-leaved heath *E. tetralix*, bilberry *Vaccinium myrtillus*, western gorse *Ulex gallii* and dwarf gorse *U. minor*. Other ericaceous species may also occur. European gorse *U. europaeus* should be recorded under scrub.



© Suzanne Bairner/Buglife, 2010.



Lichen/bryophyte heath – lichen (often *Cladonia* species) and bryophyte communities on acid substrates where there is less than 30% cover by vascular plants. It is generally found in association with other heathland or acid grassland vegetation.



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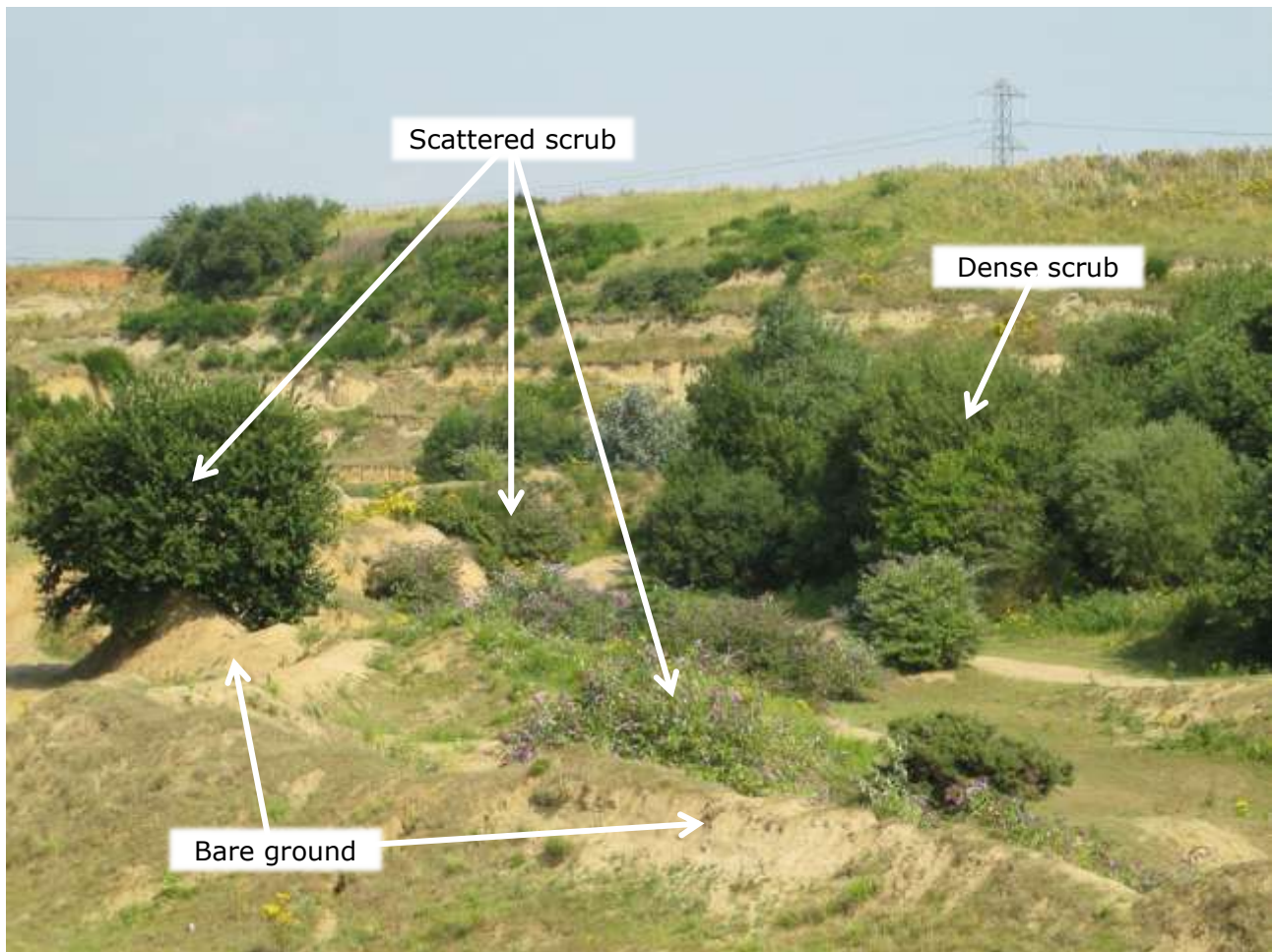




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### D.5 Woodland and scrub

Scrub – woody vegetation generally between 0.5 m and 5 m high and consisting of plants with many stems (Barkman, 1990). Areas of continuous scrub over 0.25 ha should be treated as woodland.



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Scattered trees – where the canopies of the trees cover less than 20% of the area, allowing sufficient space between to still be considered open.

*Example image unavailable.*

Woodland (greater than 20% canopy cover) – where the canopies of the trees cover 20% of the area or more. This is a closed habitat, so areas over 0.25 ha will generally be excluded from OMH site boundaries.

*Examples can be found in images under other habitats.*



## D.6 Wetland

Marshy grassland – grasslands that have a high water table and include species such as purple moor grass *Molinia caerulea*, rushes *Juncus* spp., sedges *Carex* spp., meadowsweet *Filipendula ulmaria*, marsh marigold *Caltha palustris* and valerians *Valeriana* spp.



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Inundation vegetation or seasonally wet areas – areas that are subject to periodic inundation or seasonal flooding of fresh water. They therefore contain plants that are adapted to periodic wetting or submergence, such as knotgrasses *Polygonum* spp., bistorts *Persicaria* spp., bulbous rush *Juncus bulbosus*, bur-marigolds *Bidens* spp., creeping bent *Agrostis stolonifera* and marsh foxtail *Alopecurus geniculatus*.



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Saline/brackish seasonally wet areas – areas that are subject to periodic inundation or seasonal flooding of saline or brackish water. They therefore contain plants that are adapted to periodic submergence and saline conditions, including plants more typical of saltmarsh.



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Swamp, fen or bog – includes areas of tall wetland vegetation, wet flushes, peat and mineral mires and *Sphagnum* bogs.



© Sarah Henshall/Buglife, 2004.

#### D.7 Water features

Pools (less than 25 m<sup>2</sup>) - a body of standing water less than 25 m<sup>2</sup>.

*Example image unavailable.*



Ponds (25 m<sup>2</sup> to 2 ha) – a body of standing water 25 m<sup>2</sup> to 2 ha in area which usually holds water for at least 4 months of the year.



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Temporary pools – pools that are more ephemeral and hold water for less than 4 months of the year.

*Example image unavailable.*

## Appendix E Plant flowering times

The following table was initially developed by Ann Fells and has been modified for inclusion here. It can be printed for use as a crib sheet to help answer question 20 on the survey form. It also records whether each species is annual (☉), biennial (☺) or perennial (☿), using standard botanical symbols. All of the species in Box 4.2 are included in bold, with the addition of other plant species likely to be found on OMH sites.

| Species   | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Achillea millefolium</b> yarrow ☿                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Aegopodium podagraria</i> ground-elder ☿           |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Aethusa cynapium</i> fool's parsley ☉              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Agrimonia eupatoria</b> agrimony ☿                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Alliaria petiolata</i> garlic mustard ☿            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Alnus glutinosa</i> alder ☿                        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Anagallis arvensis</i> scarlet pimpernel ☉         |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Anchusa arvensis</i> bugloss ☉                     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Anthemis arvensis</b> corn chamomile ☉/☉           |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Anthemis cotula</b> stinking chamomile ☉/☉         |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Anthemis tinctoria</b> yellow chamomile ☉/☿        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Anthriscus sylvestris</b> cow parsley ☿            |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Anthyllis vulneraria</b> kidney vetch ☿            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Aphanes arvensis</i> parsley-piert ☉               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Arctium</b> spp. burdock ☿                         |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Arenaria serpyllifolia</i> thyme-leaved sandwort ☉ |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Armoracia rusticana</i> horse-radish ☿             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Artemisia absinthium</b> wormwood ☿                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Artemisia vulgaris</b> mugwort ☿                   |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Aster novi-belgii</b> confused michaelmas-daisy ☿  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Atriplex patula</b> common orache ☉                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Atriplex prostrata</b> spear-leaved orache ☉       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Ballota nigra</b> black horehound ☿                |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Bellis perennis</i> daisy ☿                        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Blackstonia perfoliata</i> yellow-wort ☉           |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Bryonia dioica</b> white bryony ☿                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Buddleja davidii</b> butterfly-bush ☿              |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Calluna vulgaris</i> heather ☿                     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Calystegia sepium</i> hedge bindweed ☿             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Campanula glomerata</b> clustered bellflower ☿     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Campanula patula</b> spreading                     |     |     |     |     |     |     |     |     |     |     |     |     |

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| <b>bellflower</b> 2I   |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Campanula rotundifolia</i> harebell</b> 2I               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Campanula trachelium</i> nettle-leaved bellflower</b> 2I |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Capsella bursa-pastoris</i> shepherd's-purse ☉/☉            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Cardamine flexuosa</i> wavy bitter-cress ☉/2I               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Carduus crispus</i> welted thistle</b> ☉                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Carduus nutans</i> musk thistle</b> ☉                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Centaurea nigra</i> common knapweed</b> 2I               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Centaurea scabiosa</i> greater knapweed</b> 2I           |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Centaureum erythraea</i> common centaury ☉                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Centranthus ruber</i> red valerian</b> 2I                |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Cerastium fontanum</i> common mouse-ear 2I                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Chaerophyllum temulum</i> rough chervil ☉                   |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Chamerion angustifolium</i> rosebay willowherb 2I           |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Chenopodium album</i> fat-hen ☉                             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Chenopodium bonus-henricus</i> good-king-henry 2I           |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Cichorium intybus</i> chicory</b> 2I                     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Cirsium arvense</i> creeping thistle</b> 2I              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Cirsium palustre</i> marsh thistle</b> ☉                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Cirsium vulgare</i> spear thistle</b> ☉                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Clinopodium vulgare</i> wild basil</b> 2I                |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Conium maculatum</i> hemlock ☉                              |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Convolvulus arvensis</i> field bindweed 2I                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Conyza canadensis</i> Canadian fleabane ☉                   |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Cornus sanguinea</i> dogwood 2I                             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Crataegus</i> spp. hawthorn</b> 2I                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Crepis biennis</i> rough hawk's-beard</b> ☉              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Crepis capillaris</i> smooth hawk's-beard</b> ☉ / 2I     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Cymbalaria muralis</i> ivy-leaved toadflax 2I               |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Cynoglossum officinale</i> hound's-tongue                   |     |     |     |     |     |     |     |     |     |     |     |     |

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| ☺  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Cytisus scoparius broom</b> 2‡                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Daucus carota carrot</b> ☺                        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Dianthus spp. pinks</b> ☺ / 2‡                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Digitalis purpurea</i> foxglove 2‡                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Dipsacus fullonum wild teasel</b> ☺               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Echium vulgare viper's-bugloss</b> ☺              |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Epilobium ciliatum</i> American willowherb 2‡     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Epilobium hirsutum</i> great willowherb 2‡        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Epilobium montanum</i> broad-leaved willowherb 2‡ |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Erica cinerea bell heather</b> 2‡                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Erica tetralix cross-leaved heath</b> 2‡          |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Erigeron acer blue fleabane</b> 2‡                |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Erodium cicutarium</i> common stork's-bill ☺      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Euphorbia helioscopia</i> sun spurge ☺            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Euphorbia lathyris</i> caper spurge ☺             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Euphorbia peplus</i> petty spurge ☺               |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Euphrasia</i> spp. eyebright ☺                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Fallopia convolvulus</i> black-bindweed ☺         |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Fallopia japonica Japanese knotweed</b> 2‡        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Filago vulgaris</i> common cudweed ☺              |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Filipendula ulmaria</i> meadowsweet 2‡            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Foeniculum vulgare</i> fennel 2‡                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Fragaria vesca</i> wild strawberry 2‡             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Fumaria officinalis</i> common fumitory ☺         |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Galega officinalis goat's-rue</b> 2‡              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Galeopsis tetrahit common hemp-nettle</b> ☺       |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Galium palustre</i> marsh-bedstraw 2‡             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Galium saxatile</i> heath bedstraw 2‡             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Galium verum lady's bedstraw</b> 2‡               |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Geranium dissectum</i> cut-leaved crane's-bill ☺  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Geranium molle</i> dove's-foot crane's-bill ☺     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Geranium robertianum</i> herb-robert ☺            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Geum urbanum</i> wood avens 2‡                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Glebionis segetum corn marigold</b> ☺             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Glechoma hederacea</i> ground-ivy 2‡              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Hedera helix common ivy</b> 2‡                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Helianthemum spp. rock-rose</b> 2‡                |     |     |     |     |     |     |     |     |     |     |     |     |

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| <i>Heracleum mantegazzianum</i> giant hogweed ☹/⚡                   |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Heracleum sphondylium</i> hogweed ☹</b>                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Hieracium</i> spp. hawkweed</b>                               |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Hippocrepis comosa</i> horseshoe vetch ⚡                         |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Hypericum perforatum</i> perforate St John's-wort ⚡</b>       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Hypericum tetrapterum</i> square-stalked St John's-wort ⚡</b> |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Hypochaeris radicata</i> cat's-ear ⚡</b>                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Knautia arvensis</i> field scabious ⚡</b>                     |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Laburnum anagyroides</i> laburnum ⚡                              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Lamium album</i> white dead-nettle ⚡</b>                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Lamium hybridum</i> cut-leaved dead-nettle ☹</b>              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Lamium purpureum</i> red dead-nettle ☹</b>                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Lapsana communis</i> nipplewort ☹                                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Lathyrus latifolius</i> broad-leaved everlasting-pea ⚡</b>    |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Lathyrus pratensis</i> meadow vetchling ⚡                        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Leontodon autumnalis</i> autumn hawkbit ⚡</b>                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Leontodon</i> spp. hawkbit ⚡</b>                              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Leucanthemum vulgare</i> oxeye daisy ⚡</b>                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Linaria repens</i> pale toadflax ⚡</b>                        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Linaria vulgaris</i> common toadflax ⚡</b>                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Lotus corniculatus</i> common bird's-foot-trefoil ⚡</b>       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Lotus pedunculatus</i> greater bird's-foot-trefoil ⚡</b>      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Lycopus europaeus</i> gypsywort ⚡                                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Malva moschata</i> musk mallow ⚡</b>                          |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Malva neglecta</i> dwarf mallow ☹</b>                         |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Malva sylvestris</i> common mallow ⚡</b>                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Marrubium vulgare</i> white horehound ⚡</b>                   |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Matricaria discoidea</i> pineappleweed ☹</b>                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Matthiola incana</i> hoary stock ☹/⚡                             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Medicago arabica</i> spotted medick ☹</b>                     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Medicago lupulina</i> black medick ⚡</b>                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Medicago sativa</i> sickle medick ⚡</b>                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Melilotus albus</i> white melilot ☹</b>                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Melilotus altissimus</i> tall melilot ☹</b>                   |     |     |     |     |     |     |     |     |     |     |     |     |

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| <b>Melilotus officinalis</b> ribbed melilot ☺                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Mentha aquatica</b> water mint 2I                           |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Mentha arvensis</b> corn mint 2I                            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Mercurialis annua</i> annual mercury ☺                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Mimulus guttatus</i> monkeyflower 2I                        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Myosotis arvensis</i> field forget-me-not 2I                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Odontites vernus</b> red bartsia ☺                          |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Oenothera glazioviana</i> large-flowered evening-primrose ☺ |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Onobrychis viciifolia</i> sainfoin 2I                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Onopordum</b> spp. cotton thistle ☺                         |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Origanum vulgare</b> wild marjoram 2I                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Papaver rhoeas</i> common poppy ☺                           |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Pastinaca sativa</b> wild parsnip 2I                        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Pentaglottis sempervirens</i> green alkanet 2I              |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Persicaria maculosa</i> redshank ☺                          |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Picris echioides</b> bristly oxtongue ☺/ 2I                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Pilosella aurantiaca</i> fox-and-cubs 2I                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Pilosella officinarum</b> mouse-ear-hawkweed 2I             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Plantago lanceolata</i> ribwort plantain 2I                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Plantago major</i> greater plantain 2I                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Polygonum aviculare</i> knotgrass ☺                         |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Potentilla anglica</i> trailing tormentil 2I                |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Potentilla reptans</i> creeping cinquefoil 2I               |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Potentilla sterilis</i> barren strawberry 2I                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Primula veris</b> cowslip 2I                                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Prunella vulgaris</b> selfheal 2I                           |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Prunus avium</i> wild cherry 2I                             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Prunus spinosa</b> blackthorn 2I                            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Pulicaria dysenterica</i> common fleabane 2I                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Ranunculus acris</b> meadow buttercup 2I                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Ranunculus bulbosus</b> bulbous buttercup 2I                |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Ranunculus flammula</b> lesser spearwort 2I                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Ranunculus repens</b> creeping buttercup 2I                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Raphanus raphanistrum</i> wild radish ☺                     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Reseda lutea</b> wild mignonette ☺/ 2I                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Reseda luteola</b> weld ☺                                   |     |     |     |     |     |     |     |     |     |     |     |     |



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| <i>Rhamnus cathartica</i> buckthorn 21              |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Rhododendron ponticum</i> rhododendron 21        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Rubus caesius</i> dewberry 21</b>             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Rubus fruticosus</i> agg. bramble 21</b>      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Rubus idaeus</i> raspberry 21                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Rumex conglomeratus</i> clustered dock 21        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Rumex crispus</i> curled dock 21                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Rumex obtusifolius</i> broad-leaved dock 21      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sagina apetala</i> annual pearlwort ☉            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sagina procumbens</i> procumbent pearlwort 21    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Salix caprea</i> goat willow 21</b>           |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Salix cinerea</i> grey willow 21</b>          |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Salvia pratensis</i> meadow clary 21</b>      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Salvia verbenaca</i> wild clary 21</b>        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sambucus nigra</i> elder 21                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sanguisorba minor</i> salad burnet 21            |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Saponaria officinalis</i> soapwort 21</b>     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Scabiosa columbaria</i> small scabious 21</b> |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Scrophularia nodosa</i> common figwort 21</b> |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Sedum acre</i> biting stonecrop 21</b>        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Sedum album</i> white stonecrop 21</b>        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Sedum anglicum</i> English stonecrop 21</b>   |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Sedum rupestre</i> reflexed stonecrop 21</b>  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Sedum telephium</i> orpine 21</b>             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Senecio erucifolius</i> hoary ragwort ☉</b>   |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Senecio jacobaea</i> common ragwort ☉</b>     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Senecio squalidus</i> Oxford ragwort ☉</b>    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Senecio vulgaris</i> groundsel ☉</b>          |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Silene dioica</i> red campion 21</b>          |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Silene latifolia</i> white campion ☉ / 21</b> |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Silene vulgaris</i> bladder campion 21</b>    |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sisymbrium officinale</i> hedge mustard ☉        |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Smyrniolus alexandris</i> ☉                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Solanum dulcamara</i> bittersweet 21             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Solanum nigrum</i> black nightshade ☉            |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Solidago</i> spp. goldenrod 21</b>            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sonchus arvensis</i> Perennial sow-thistle       |     |     |     |     |     |     |     |     |     |     |     |     |

| Species   | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2f  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sonchus asper</i> prickly sow-thistle ☉                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sonchus oleraceus</i> smooth sow-thistle ☉               |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sorbus aria</i> common whitebeam 2f                      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Sorbus aucuparia</i> rowan 2f                            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Stachys palustris</i> marsh woundwort 2f                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Stachys sylvatica</i> hedge woundwort 2f                 |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Symphytum officinale</i> common comfrey 2f               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Tanacetum vulgare</i> tansy 2f</b>                    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Thymus polytrichus</i> wild thyme 2f</b>              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Thymus pulegioides</i> large garden thyme 2f</b>      |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Torilis japonica</i> upright hedge-parsley ☉             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Tragopogon pratensis</i> goat's-beard ☉                  |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Trifolium arvense</i> hare's-foot clover ☉</b>        |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Trifolium campestre</i> hop trefoil ☉</b>             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Trifolium dubium</i> lesser trefoil ☉</b>             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Trifolium medium</i> zigzag clover 2f</b>             |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Trifolium pratense</i> red clover 2f</b>              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Trifolium repens</i> white clover 2f</b>              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Tripleurospermum maritimum</i> sea mayweed ☉ / 2f</b> |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Tussilago farfara</i> colt's-foot 2f</b>              |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Ulex europaeus</i> gorse 2f</b>                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Urtica dioica</i> common nettle 2f                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Vaccinium myrtillus</i> bilberry 2f</b>               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Verbascum nigrum</i> dark mullein ☉</b>               |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Verbascum thapsus</i> great mullein ☉</b>             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Verbena officinalis</i> vervain 2f                       |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica agrestis</i> green field-speedwell ☉            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica arvensis</i> wall speedwell ☉                   |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica chamaedrys</i> germander speedwell 2f           |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica filiformis</i> slender speedwell 2f             |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica hederifolia</i> ivy-leaved speedwell ☉          |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica persica</i> common field-speedwell ☉            |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica polita</i> grey field-speedwell ☉               |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Veronica serpyllifolia</i> thyme-leaved speedwell 2f     |     |     |     |     |     |     |     |     |     |     |     |     |



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|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b><i>Vicia cracca</i> tufted vetch</b> 21    |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Vicia hirsuta</i> hairy tare</b> ☉      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Vicia sativa</i> common vetch</b> ☉     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Vicia sepium</i> bush vetch</b> 21      |     |     |     |     |     |     |     |     |     |     |     |     |
| <b><i>Vicia tetrasperma</i> smooth tare</b> ☉ |     |     |     |     |     |     |     |     |     |     |     |     |
| <i>Viola arvensis</i> field pansy ☉           |     |     |     |     |     |     |     |     |     |     |     |     |