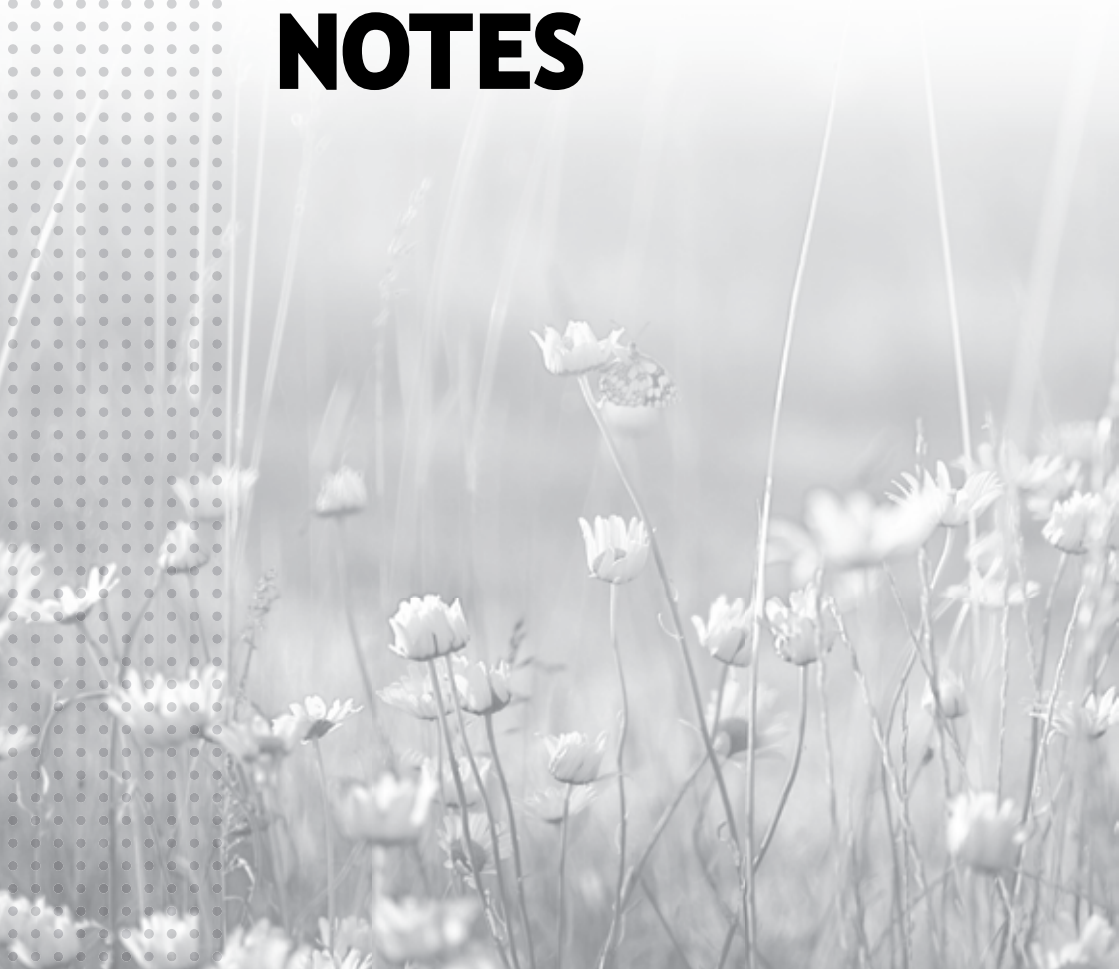
National Plant
Monitoring Scheme

National Plant Monitoring Scheme

SURVEY GUIDANCE NOTES



Support and advice

We value your time and effort and a dedicated team is able to support you with your survey. Keep up to date with workshops and training days by visiting **www.npms.org.uk**.

If you have questions about any aspect of this survey methodology or would simply like some more advice then please email **support@npms.org.uk** or phone **(01722) 342743**.

Where data cannot be entered online survey forms should be sent to:
NPMS Volunteer Coordinator
Plantlife
14 Rollestone Street
Salisbury
Wiltshire
SP1 1DX

National Plant Monitoring Scheme

SURVEY GUIDANCE NOTES

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1.0
Background information

Thank you for volunteering to take part in the National Plant Monitoring Scheme (NPMS). This scheme is an exciting survey that focuses on plant recording in specific habitats (NPMS habitats) and provides statistically robust data that will enable us to:

- **learn more about where our wild plants are growing and how they are changing**
- **measure the condition of the habitats in which our wild plants grow**
- **use plants as 'indicators' to provide evidence to UK and national governments about the state of the natural environment**

In addition we aim to provide you with annual feedback on the survey results.

The scheme is being run by a partnership of the Botanical Society of Britain and Ireland (BSBI), Centre for Ecology and Hydrology (CEH), Joint Nature Conservation Committee (JNCC) and Plantlife.

1.1
How does the survey work?

The survey has been designed to monitor the abundance of sets of species within fixed plots (square or linear plots) in 28 fine NPMS habitats, which can be combined into 11 broad NPMS categories, see below. The habitats are described on page 27. For any one of the 28 NPMS habitats there are up to 30 species to record depending on the level at which you are participating (see page 8). Those who wish to may record all species in their plots.

The species have been selected because they are associated with a particular habitat, either as positive or negative indicators, which enables the quality of a habitat to be monitored over time. The way that the kilometre squares and plots are selected means that the information you collect will be statistically robust for detecting change in plant communities across the UK. Species lists can be found in the NPMS Species Lists booklet.

Broad categories and fine habitats

There are 28 fine NPMS habitats which can be combined into 11 broad NPMS categories. Where possible we would like you to identify the fine habitat you are in and refer to the appropriate species list. However, we know that some habitats may be harder to classify than others, and in this instance we have provided species lists for broad categories. So, for example, if you cannot decide whether you are in neutral damp grassland or pasture and meadow (both fine scale habitats in the broad category lowland grassland) you should use the lowland grassland species list in order to complete the survey.

1.2
What do I have to do?

1 Survey a minimum of 5 plots in different NPMS habitats

- ✓ We encourage you to survey a minimum of 5 plots within the kilometre square that you have been allocated.
- ✓ Surveys should only be carried out in the NPMS habitats which are described on page 27 of this guidance.
- ✓ We recommend that surveyors complete 3 square plot surveys and 2 linear plot surveys per kilometre square but the number and composition is up to you and will be influenced by the nature of your kilometre square.
- ✓ Most plots will be either 5x5m or 1x25m in size.
- ✓ Where possible we would like you to locate each of your plots in a different NPMS habitat. **Individual plots should always be located in a single habitat.**
- ✓ If you can locate an accessible pond or flush in your kilometre square, then please do try to survey that.

2 Enter findings online

Please enter your data online at **www.npms.org.uk**. This provides the most efficient way of ensuring that your findings contribute to annual reporting on the state of habitats as well as building up a picture of how the habitats are changing over time. If you cannot enter your data online then please post your recording forms to us at the address provided on the inside front cover of this guidance.

1.3
When should I survey?

We are asking you to visit your plots twice per year, once in late spring or early summer and once in late summer. In the first year of surveying you may wish to make an initial reconnaissance visit in order to confirm where your plots are and to get to know your kilometre square.

The time taken to complete the survey will vary depending on the level of survey being undertaken, terrain and the distance between plots. We envisage that as surveyors become more experienced, and get to know their square better, it will take less time.

1.4
What am I being provided with?

1. **A kilometre square:** In order to take part in the scheme you will have registered with us and have been allocated a kilometre square in which to do your survey.
2. **A map:** You have been provided with a map of your square. An example map can be found on page 5. The presence of many of the NPMS habitats may be shown by coloured shading on your map and this is intended to support you in making decisions about where to survey. Please note:
    - NPMS habitats may also be present in unshaded areas on your map
    - the habitat type indicated by the shading may not be what you encounter on the ground due to changes since information was captured or inaccuracies in the mapped data
    - some NPMS habitats, especially linear ones such as arable field margins, hedgerows, rivers etc., will not be indicated by shading

The map also shows gridlines to help you select linear plots (see below) and up to 25 pre-selected plot locations. These pre-selected plot locations indicate areas within which we recommend you carry out your square plot surveys but only if these locations coincide with NPMS habitats.

Remember we are only asking you to complete 3 square plot surveys.

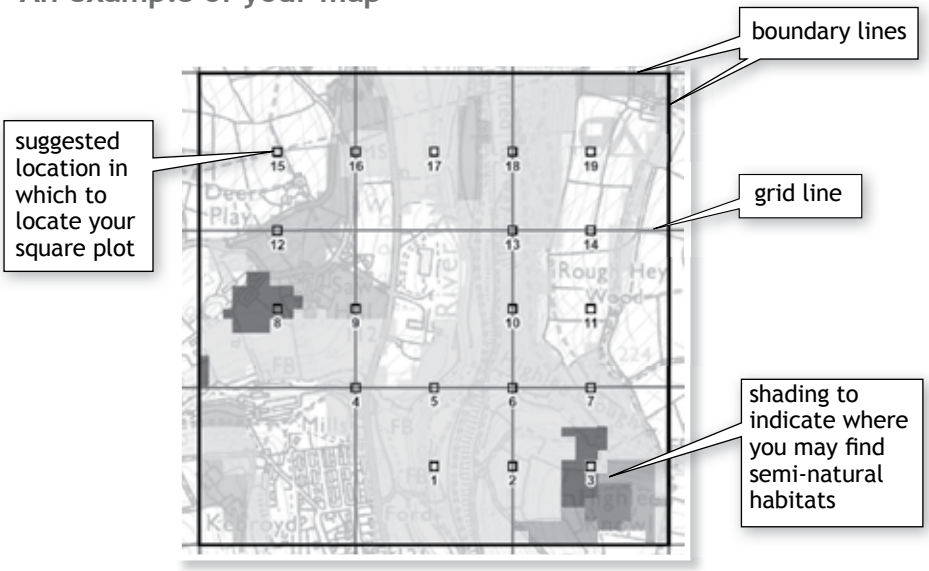
3. **A species guide:** This has photos, illustrations and descriptions for all the species we are asking you to record.

4. **An NPMS Species List:** This provides the species lists for both broad NPMS categories and fine NPMS habitats and should be used when you are surveying.

5. **Monitoring forms:** We will be sending out monitoring forms each year to enable you to record your findings. Extra copies of these forms can be downloaded from the NPMS website.

Additional information, frequently asked questions and other sources of support can also be found on the NPMS website.

An example of your map



1.5
What if the species on the list are not present in my plot?

The number of species you are able to record for each plot you visit will depend on the quality of the habitat. Each NPMS habitat we are interested in has a species list assigned to it and these can be found in the NPMS Species Lists booklet. The species have been carefully selected based on a number of factors including ease of identification, usefulness as indicators of habitat quality (both positive and negative) and distribution.

Recording fewer species does not mean that your observations are not of value. Where you are unable to record many species it may be that the particular habitat you are recording is in decline for some reason. This is very important information.

There is a facility online to record any additional species of interest you find within your kilometre square, in case you find that our target species are largely absent from your plots; this extra information is still of use for broader-scale analyses of change in our wild plants, but will not directly feed into measures of habitat quality or species trends created from the NPMS survey results.

1.6
What if my habitat changes over time?

When you first visit your plot you should decide which NPMS habitat it should be assigned to using the guidance on page 27. However, over time your plots may change between habitat type due to management or other environmental changes. For example, dry heathland may change to dry acid grassland due to increased grazing or nitrogen deposition. This is not a problem and is the sort of change we would like NPMS to detect. Simply use the appropriate species list at the time of the survey.

If at some point your plot turns into a habitat that is not covered by the scheme, for example pasture and meadow to scrub, please continue surveying with the NPMS species list for as many years as possible. This will provide the most information on habitat change. It is important that these plots continue to be monitored in case they re-enter the scheme at some future point.

You do not need to select new plots if you find that, in one year, some of your plots fall outside of the NPMS habitat definitions, or have none of the NPMS species.

1.7
What if I am surveying multiple squares?

If you have asked to be allocated multiple squares, but cannot survey each square annually, then you can visit your squares in alternate years using the intervals shown below. This means in any one year you are surveying at least one of your squares. No surveyor will be allocated more than 5 squares. This means the maximum interval between visits to any single square is five years.

Number of squares allocated	Minimum frequency of survey
1	Every year
2	Every other year
3	Every third year
4	Every fourth year
5	Every fifth year

1.8
What if I cannot do the survey in a particular year or wish to withdraw?

The aim of this survey is to build up data over many years to allow us to accurately assess how and why plant communities are changing. If you wish to withdraw from the scheme then please let us know. We will endeavour to make your plots available to others to survey.

2.0
Carrying out the survey

2.1
What are the survey levels?

The NPMS has three survey levels, described below. The level you choose to survey at will depend on your confidence, knowledge and the time you have available. We encourage you to progress through the levels, for example starting at Wildflower Level and then moving to Indicator Level.

Survey levels

Wildflower Level – surveying at this level involves recording fewer species. All the species you record are a subset of the species at Indicator Level.

Indicator Level – as for the Wildflower Level but using all the species chosen to indicate different aspects of their habitats. This level gives us very robust data so where possible we would encourage you to aim to participate at this level.

Inventory Level – carrying out the survey at Indicator Level but in addition recording all other species of vascular plant present within each plot.

2.2
How do I select square plots?

All square plots will measure 5x5m in size with the exception of woodlands which will be 10x10m. Every effort should be made to situate your square plots within the pre-selected plot locations shown on the map you have been given, providing these correspond to an NPMS habitat. Plots should only ever cover a single NPMS habitat (see page 12 for further details about setting up plots in the field).

The colour shading on the map indicates where you may find some of the NPMS habitats. Where possible, choose 3 plots in different fine NPMS habitats, listed on page 27. In the first year it may be that you visit plots that turn out not to contain NPMS habitats. If you wish to you can record up to 3 of these plots as 'not in scheme'. You can enter these plots along with your surveyed NPMS habitat plots when you enter your data online. These plots can be checked in future years to ensure that they have not become NPMS habitats (e.g. neutral pastures and meadow restored from arable).

There may be reasons why you cannot survey the pre-selected plots. These include:

- **Safety factors;** for example, the plot would be too close to a cliff edge, water course or area of land under temporary closure because of shooting, military activities etc. On no account should you compromise your safety. For more information see page 26.
- **Accessibility;** for example, land which may have access restrictions. Please read our guidance on page 25.
- **Access restrictions due to plant diseases such as *Phytophthora*;** please pay attention to any access restrictions resulting from biosecurity and follow the information provided on any site you may visit.
- **The location of the pre-selected plots does not correspond to any of the NPMS habitat types;** the pre-selected plot locations lie on a systematic grid, and have not been selected because of knowledge of their habitat type. It is possible that none of the pre-selected plot locations lie in relevant habitats; however, the selection of one kilometre squares has been purposely biased towards those with NPMS habitats.

If there are not 3 accessible pre-selected locations within NPMS habitat types, you can:

- include a square plot centred on a flush, if present in your square – flushes are often in small patches and we are encouraging plots within these
- locate new square plots elsewhere within your square following Protocol A below
- increase the number of linear plots you do

For any plot you survey it is important that you are able to identify key features that will enable you to relocate those plots in subsequent years (see Table 2, page 15).

Protocol A – Self-selecting plots

Where possible, self-selected plots should be located in representative areas of an NPMS habitat type (i.e. in areas which match the 'average'). Please resist the temptation to place plots in the most species-rich areas and avoid areas that have clearly been affected by disturbance (unless that is typical of the habitat type as a whole such as on arable land). Plots can be placed anywhere within the habitat type, including close to the edge, if that is typical or representative. When self-selecting square plots, it may be useful to consider the shaded areas on the map, as these are generally more likely to contain habitats of interest.

Plots should be located so that they can easily be relocated in the future. You may wish to mark your self-selected plots on your map for future reference.

2.3
How do I select linear plots?

Most linear plots will be 1x25m in size and be used to sample the following habitat types: arable field margins, standing and running waters, rock outcrops, screes, road verges and hedgerows (see Table 3, page 16). Use your map, aerial images* of your square or knowledge on the ground to decide where linear plots could be placed by finding where these linear features intersect one of the internal or boundary gridlines that are marked on the map you have been provided with. Your linear plot should start at the point where the feature intersects the gridline, and can be laid out in any direction along the feature from there. Aerial photographs are particularly useful to help you identify linear plots that may not be shown on an OS map, for example hedgerows and arable field margins.

Note that plots in ponds and some plots in flushes are also linear, but that these plots should be included even when they do not intersect with the gridlines.

When you visit your square select a minimum of 2 linear plots that are accessible to survey. If you cannot locate and survey 2 linear plots using the method described above then use Protocol A to self-select linear plots.

***aerial images can be viewed online. Try sites such as:**

Google maps: www.maps.google.co.uk

Get a map: www.getamap.ordnancesurveyleisure.co.uk

UK Grid Reference Finder: www.gridreferencefinder.com/

Grab a Grid Reference: www.bnhs.co.uk/focuson/grabagridref/html/index.htm

2.4
How do I select ponds and flushes?

Ponds and flushes may only be rarely encountered; ponds should be surveyed as linear plots, whilst flushes maybe square or linear plots. If you only have one pond or flush in your square then survey that feature providing it is accessible. These plots can count towards your minimum, even though they are selected differently. If you have more than one pond or flush then you should identify which are accessible and survey the one closest to the centre of your square.

2.5
How do I lay out plots?

Finding the precise location of the plots marked on your map may be tricky but try to locate your plot as accurately as possible. A list of equipment that may be useful in helping you lay out plots is provided in Table 1.

- Make sketches and photos to ensure that you will be able to relocate your plot in subsequent years and mark the plots you survey on your map. When you submit your data online you will be asked to indicate where your plots were located. It is important to identify any obvious features to aid relocation (see Table 2, page 15).
- You will then need to mark or pace out your plot.

Table 1: Useful equipment for surveyors

- **tape measure or a length of cord marked at 5m intervals sufficient to mark out 25m or 40m depending on plot dimension**
- **four corner markers such as tent pegs or bamboo canes. Markers should not be left in the ground**
- **NPMS recording forms, identification guide and guidance notes**
- **a clipboard or something you can use to create a right angle**
- **GPS if you have one and/or a compass**
- **camera**
- **pencils**

Square plots

- Locate your plot and decide how you want to position it.
- Plots will be 5x5m with the exception of woodlands which will be 10x10m.
- Using markers and cord or your tape measure, align the first side of the square in a way that will aid relocation if possible, for example parallel to a wall, fenceline, or other permanent feature.
- Use a clipboard or straight edge to create a right angle and lay out the next side of the plot. Fix the marker. Work round until you have completed a square plot.
- If you have a GPS then use it to establish the position of the square using the south west corner (or nearest equivalent). Please note which corner has been used on the sketch map.
- Take a photograph of your plot that shows its position in relation to its surroundings. This can be uploaded onto the NPMS website. This will help relocate your plot in subsequent years and help to show changes over time. Note the direction you are facing when you take the photo. We recommend that only two photographs are uploaded per plot.
- Make a sketch of your plot in the space provided on your survey form.

Linear plots

- When you visit your kilometre square select two linear plots that are accessible to survey using the method described above.
- Linear plots will measure 1x25m, but they do not need to be rectangular as your plot may follow a winding feature (e.g. the edge of a water body or sides of an arable field).
- Use two markers to establish the 1m width, and then using your cord or tape measure out 25m in length. For this shape of plot it is useful to note where to measure your 1m width in different habitats (see Table 3, page 16).

- If you have GPS you can use it to record the position of both ends of the plot and take photographs from outside the plot showing its surroundings. This can be uploaded onto the NPMS website. This will help relocate your plot in future years and help to show changes over time. Note the direction you are facing when you take the photo. Only two photographs can be uploaded per plot.
- Make a sketch of the plot in the space provided on your survey form.

Please note that in some instances the linear habitat in which you are surveying may be shorter than the length of your linear plot. In such instances, record the complete length of the linear feature and note the length surveyed.

Vertical plots for rock outcrops, cliff bases or screes

For recording rock outcrops, the long dimension of the linear plot should be placed along the base of the rock outcrop and the shorter dimension should extend vertically up the face of the outcrop to around head height. The dimensions of this **vertical plot** are therefore 2m high x 12.5m long. Most species should be identifiable at this distance thereby avoiding the need for you to take unnecessary risks.

The same dimensions should be used on screes (12.5x2m) and should be recorded as a single traverse, noting species present within 1m either side of the route taken. In order to minimise the risk of injury, scree plots should follow contours (i.e. at the same altitude). **Do not take unnecessary risks and, if in doubt of your personal safety, do not attempt to record plots.**

Further information about surveying in different habitats is provided in Table 3, page 16.

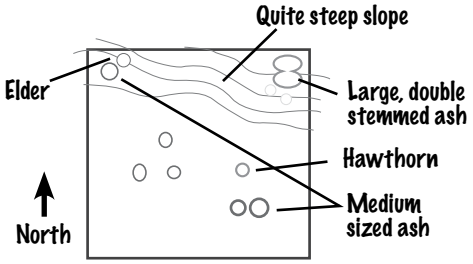
Table 2: Re-finding your plot in the future

The NPMS has been designed to monitor change over many years. It is therefore important that the location of plots remains fixed and you (or another surveyor should you choose to withdraw from the scheme) are able to relocate your plots.

Sketch map

Please provide a field sketch of the plot showing the orientation of the plot and key features. This can be scanned or photographed and uploaded onto the online data entry system for NPMS. An example field sketch is shown left. It is essential to include a compass direction and mark down any permanent features that will help to relocate the plot e.g. gateposts. It is also important to mark the position and direction of any photographs taken. This information will be extremely useful in subsequent years.

Sketch map of plot



Photos

Photos can also be taken to show your plot. A maximum of 2 photos per plot can be uploaded onto the online data entry system. Your internet browser should automatically resize these but in the unlikely instance that this is not the case, please ensure your photos are less than 5Mb. It would be helpful to record the direction you are facing with a compass when you take the photo and additional notes to support your photos are of always of use.

GPS

OS grid coordinates derived from a hand-held GPS can be used to increase the accuracy of your plot locations. Note GPS is more accurate in open habitats than in wooded habitats and should be seen as a support tool and should not replace field notes and sketches.

Table 3: Further information about plots in different habitats

Arable field margins

Linear plots on arable field margins should extend 1m from the edge of the cultivated area into the crop. These should only be placed on the margins of annually cultivated fields that are being cropped for cereals, maize, oil seed rape or root vegetables.

Fields that are being used to produce perennial crops such as fruit or biofuel crops (e.g. willow, elephant-grass, etc.) should be ignored. Where fields with annually cultivated crops have permanent strips sown with grasses, pollinator/wildflower mixtures, or game cover, plots should be placed on the boundary between the permanent strip and the crop and extend 1m into the cultivated area, see Diagram 1, page 18.

If there has been a change to your arable field margin – for example in Year 1 the field was cultivated and so you could record there and in Year 2 it wasn't cultivated (e.g. setaside, stubble, etc.) you would continue to record the field margin.

Road verges

Road verges are not a habitat targeted by NPMS in their own right, but they frequently contain NPMS habitats such as grassland, heath, etc. When road verges are found to correspond with target habitats, 25x1m linear plots should be recorded using the relevant species list.

Hedgerows

If possible, record a 25x1m plot that is 1m out from the centre of the hedge, using the NPMS species list for the ground flora and shrub species present. If the width of the hedge does not allow this (for example if shrub component is much wider) then just record the species present in the outer 1m. If you are doing the Inventory survey then record species rooted within the linear plot area.

Table 3: Continuted

Standing waters, rivers, streams, ponds and canals

These habitat plots should be recorded without entering the water. Only survey from the bank. For running and standing freshwater, plots should extend for 25m along the bank and 1m out from the maximum edge of the normal water level, see Diagram 2, page 18. The plots will therefore encompass plants rooted on the margins of the water body (emergents) as well as plants growing in open water (aquatics) either underwater (submerged aquatics) or on the water surface (floating aquatics).

Due to fluctuations in water level, the position of water body plots can be difficult to define. Therefore water-bodies where water levels fluctuate markedly (e.g. turloughs, dew ponds, winterbournes, etc.) or where levels are artificially maintained should be ignored. For more permanent water-bodies, plots should be carefully selected and recorded to ensure that they can be relocated accurately.

Springs and flushes

Springs and flushes often occur in irregularly shaped habitat patches that are often too small for a 5x5m plot. When sampling small flushes and springs therefore, you should use a square or linear plot such that the dimensions maximise the proportion of the plot made up by the NPMS habitat, with the general rule that 50% or more should comprise the NPMS habitat. Where other habitats occur within the plot, recording of target species should only be undertaken within the flush or spring area using the appropriate species list.

Diagram 1: Laying out a plot in an arable margin

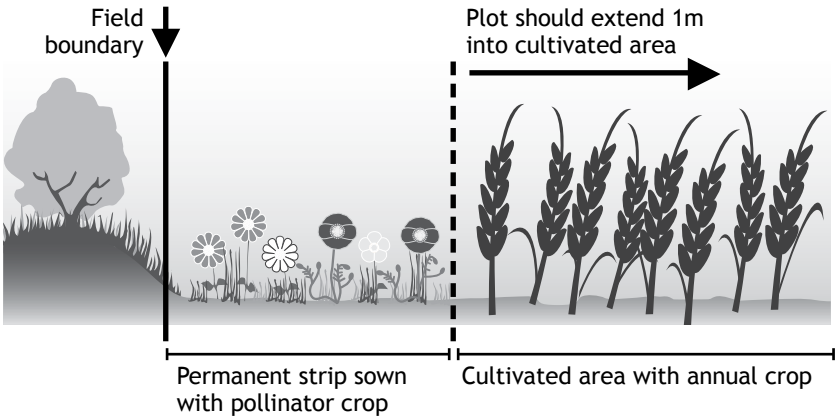
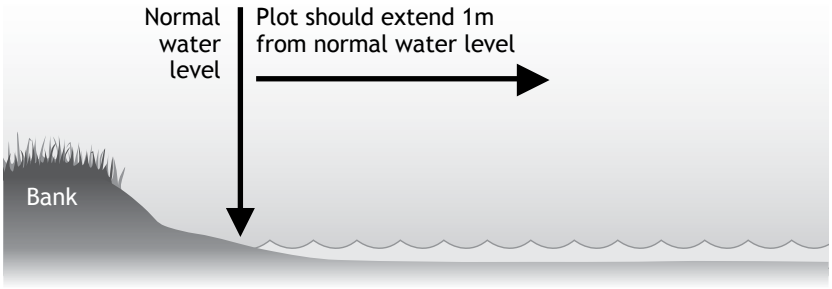


Diagram 2: Laying out a plot along standing waters, rivers, streams, ponds and canals



3.0
How to record in your plots

The method for recording is the same for all plots. You will need to use the relevant species list provided for each habitat you survey.

1 Record the species present

Use the relevant species list and search your plot to see what species are present. Square plots are searched most efficiently by recording intensively in one corner and then gradually moving out through the rest of your square until you have covered the whole area, adding new species as you go. Be careful not to trample or flatten areas that are yet to be surveyed. Linear plots are easier but the technique is the same; intensively search the first few metres, and then move along, picking up any additional species as you go.

Those surveying at the Inventory Level don't have a target species list but should follow a similar protocol.

2 Assess the abundance (% cover) of each species

This simply means estimating the amount of ground each species takes up as a percentage of the total area of the plot. As you are searching your plot you will get a good idea of how much of each species there is in it. When doing this it is easy to just focus on the flowers. Don't forget the leaves!

Remember also that plants often grow in layers and can therefore cover other plants growing beneath them, so always look beneath larger plants. It is important to assess each species separately. It helps to remember that 1% of a 5x5m or 25x1m plot is 50cm x 50cm and 1x1m in a 10x10m plot. You may want to create a square of this size to take out with you or simply measure and put in a marker.

% cover is estimated using the Domin scale on the inside back cover of this booklet.

3 Assess the percentage of bare ground; litter cover; bare rock/gravel and moss/lichen

For each of the following assess the percentage cover and give a score using the Domin scale as outlined above.

- bare ground
- litter (e.g. dead stems, leaves, twigs and dead wood)
- bare rock/gravel
- moss/lichen

4 Recording additional information

We recommend that you record the following extra information for each plot as this will help greatly in interpreting the results. Please note that some of this information is optional.

Vegetation height – record the presence of vegetation within the following height classes: <10cm, 11-30cm, 31-100cm, 101-300cm and >300cm. Each class should be scored on a scale of 1 to 3 with 1 representing less than one-third of the area; 2 representing one-third to two-thirds; 3 representing more than two-thirds of the area of the plot. In woodlands this measure should only be applied to the ground and shrub layer and should exclude the woodland canopy.

Woodedness (density of trees and shrubs) – record the woodedness using the categories below.

- dense tree and/or shrub cover
- scattered trees and/or shrubs
- hedgerow
- no trees or shrubs

The following information is optional to record but where possible we would encourage you to report on the attributes below:

Aspect (optional) – if the plot occurs on a slope, record the main direction that the slope is facing from the following categories: N, NE, E, SE, S, SW, W, and NW.

Slope (optional) – record the main slope angle: flat (0-5°), moderate (6-30°), or steep (>30°).

Management (optional) – note any obvious signs of management at the time of survey, such as the presence of livestock, ditch clearance, hedge-cutting, coppicing, etc., with an indication of the intensity (see Table 4 for examples). For arable land this could include evidence of weed or pest control. Field observations should be supplemented with more details where known (e.g. history of grazing on the site).

Grazing (optional) - the intensity of grazing including both livestock and wild animals (see Table 5 on page 23 for explanation of categories).

Table 4: Different management descriptions

- **Arable cropping**
- **Burning**
- **Coppicing**
- **Cutting / mowing**
- **Ditch-clearance**
- **Fenced to exclude grazing**
- **Fertilised to improve soil fertility**
- **Grazing – livestock**
- **Grazing – rabbits/deer**
- **Hedge-laying**
- **Herbicides to control weeds**
- **Path, track or road construction / maintenance**
- **Quarrying**
- **Scrub clearance / tree felling, silage production** (i.e. black bags)
- **Tree planting**
- **Water regime regulation** (flood management in areas deliberately flooded e.g. sluice gates, weirs)

Table 5: Level of grazing

Level	Grazing
High	Vegetation very short and clearly maintained by high levels of livestock and/or deer/rabbit grazing; there are often visible signs of their presence such as dung, animal fibres, tracks, warrens/dens and infrastructure associated with livestock (e.g. water-troughs, supplementary feeders, etc.). Trees and shrubs are likely to be rare on such sites or if present with clear signs of grazing (e.g. loss of lower leaves, bark, etc.). Many herbs and grasses lacking flowering stems.
Moderate	Evidence of grazing animals being present (tracks and signs) but the vegetation height is often variable with a mixture of taller and shorter areas; shrubs and trees more likely to be present and showing little evidence of grazing damage. Most herbs and grasses with flowering stems.
Low	No or very little evidence of grazing animals being present; the vegetation height usually being uniformly tall and often with an abundance of shrubs or trees. No evidence of flowering stems having been removed though many species unable to flower due to height of the vegetation.

4.0
Survey forms

Please make sure that you use the survey form provided to enter your data. This helps with administration.

Survey forms are included with these notes and more can be downloaded from the NPMS website. It is useful to have the forms on a clipboard when you are completing a survey, and it is often best to use a pencil to fill them in as pencil writes better than ink in the damp.

You will need one form per plot, but that form can be used for both visits if you are able to survey twice. Please make sure that you fill in as much as you can, particularly plot location, as that is very important, either as a grid reference or GPS co-ordinates.

What do I do with the data collected?

We would encourage you to enter your data online at www.npms.org.uk You will need to register with the site. If you have previously registered with the site then you will not need to do so again.

Please contact us at:

support@npms.org.uk if you are having any difficulties.

If you cannot enter data online then please post forms to:

NPMS Volunteer Coordinator
Plantlife
14 Rollestone Street
Salisbury
SP1 1DX

5.0
Access rights and responsibilities

We ask that wherever you are surveying you:

- **Respect the countryside and other countryside users.**
- **Respect other people and their interests.**
- **Protect and care for the natural environment.**
- **Take responsibility for your own actions.**
- **Enjoy the outdoors.**

Access rights and responsibilities are different in different countries of the UK. For England and Wales the Countryside Code gives advice on access. In Scotland the Scottish Outdoor Access Code defines rights and responsibilities, and in Northern Ireland guidance is given by the Northern Ireland Environment Agency.

Please be aware of your rights and responsibilities when conducting wild plant surveys. In England and Wales only enter private land with permission to do so – otherwise keep to public footpaths, rights of way and Open Access Land. Similar provision applies to Northern Ireland, although there is no defined Access Land as is the case in England and Wales.

In Scotland, everyone has the right to be on most land and inland water providing they act responsibly. For undertaking surveys of plots, the Scottish Outdoor Access Code advises surveyors to contact the land manager(s) if possible and follow advice on what precautions you might need to take at the time of your survey.

Unfortunately we are not able to arrange access for you, although we do provide a letter that you can use as a means of 'introduction' to landowners; this can be downloaded from the NPMS website.

6.0
Health and safety

You are responsible for your own health and safety. We want you to enjoy taking part in the survey and for every visit to be trouble free, so we ask that you do not take any unnecessary risks.

- **Always check the forecast the day beforehand and be prepared to abandon fieldwork in the event of bad weather.**
- It is quite possible that the map you will receive will have plots shown on it that are inaccessible because they may be unsafe to survey. Habitats that are likely to pose potential dangers include those on steep slopes, cliff-tops, rock outcrops and screes as well as habitats in tidal areas. Extreme care should be taken when surveying any of these habitats. **If an area does not look safe then please do not survey there. If you have any concerns about accessing a plot then you should not approach it.**

We ask that you take all necessary precautions during your survey. If possible work with a 'buddy' or let someone know where you are planning to go and when you are likely to be back. This is essential when visiting remote areas. We recommend you carry a mobile phone, although remember that these are unlikely to work in remote regions. Always carry a first-aid kit and wear appropriate clothing, particularly footwear and protection from sun, wind and rain.

Appendix 1:
Habitat types

There are 28 fine NPMS habitats which can be combined into 11 broad NPMS categories (numbered below). If you know which fine habitat you are in, then you should use this fine habitat classification to select the relevant species list. If you cannot decide on an appropriate fine scale habitat, then choose the broad category and its associated species list. Broad categories will have longer species lists.

1. **Arable field margins** comprising: **Arable field margin**

Arable field margins are the areas alongside and following the edge of annually harvested crops including cereals, oil-seed rape, root crops and stubbles, and cultivated fallow fields (ploughed fields with no crop). Fields that are being used to produce perennial crops such as fruit or biofuel crops (e.g. willow, elephant-grass, etc.) should not be included when initially setting up plots. Where fields with annually cultivated crops have permanent strips sown with grasses, pollinator/wildflower mixtures, or game cover, plots should be placed on the boundary between the permanent strip and the crop and extend 1m into the cultivated area.

2. **Bog and wet heath** comprising: **Blanket Bog, Raised Bog and Wet Heath**

Bogs are wetland habitats underlain by deep, acidic peat that get most of their water from rainfall. They occur in wetter areas of the country, with characteristic vegetation including abundant *Sphagnum* mosses, Purple Moor-grass, sedges, cottongrasses, Heather and Cross-leaved Heath. Wet heath shares many of the same species but wet heath tends to occur on shallower peats on slopes where they receive most of their water from the slopes above.

Blanket bog mainly occurs in upland areas although it is also found at lower altitudes in the cooler, wetter oceanic climates of the north and west of the UK including upland sites in Northern Ireland. Areas of blanket bog are mainly rain-fed although they can also be fed by surface drainage. They tend to be large, level or gently sloping areas where there has been a deep accumulation of peat. Typical species include *Sphagnum* mosses, along with Bog Asphodel and sundews. Your plot area may have small bog pools within it. Wet heaths which occur on shallower peats are often found on more sloping terrain surrounding blanket bogs.

Raised bogs are large, dome-shaped bogs raised above the level of the surrounding land, usually with drainage ditches around the edges. They are mainly rain-fed and are underlain by acidic peat. They are found in lowland regions of Wales, England (from the Midlands northwards) and scattered throughout Scotland and Northern Ireland (e.g. Garry Bog, Fairy Water bogs). Cranberry and *Sphagnum* mosses are characteristic species of raised bogs. Your plot area may have small bog pools within it.

Wet heaths occur on shallow peat (<0.5m) and often form a mosaic with dry heath and blanket bog, mainly in the uplands of the north and west of the UK. A good example in Northern Ireland is the West Fermanagh Scarplands. Unlike dry heaths, species such as Cross-leaved Heath, Purple Moor-grass, Bog Asphodel and Common Cottongrass predominate, along with abundant *Sphagnum* mosses. If the peat is deeper then the habitat is more likely to be blanket or raised bog.

3. **Broadleaved woodland** comprising: **Dry deciduous woodland, Hedgerows of native species and Wet woodland**

This broad category includes all native hedgerows and deciduous woodlands including newly planted woods (e.g. farm woodlands), but excludes ornamental woods (e.g. within the grounds of country houses) and commercial plantations of native species.

Dry deciduous woodland includes natural or semi-natural woodlands with canopies made up of one or more of the following native broad-leaved deciduous species: Birch, Beech, Ash, Aspen, Pedunculate/Sessile Oak, Rowan, Large/Small-leaved Lime, and Wych Elm.

Hedgerows of native species include all hedgerows made up of native trees and shrubs such as Field Maple, Hawthorn, Elder, Hazel, Holly, Blackthorn, Spindle, Ash and Pedunculate/Sessile Oak. You should record from both species-rich (more than 5 native species per 25m length) and species-poor types (less than 5 native species per 25m length), as well as those that have been recently planted.

Wet woodland is usually dominated by Willows, Downy Birch, Alder, Poplar and Pedunculate/Sessile Oak and is associated with fens, rivers, streams and lakes, wherever the soil is permanently wet.

4. **Coast** comprising: **Coastal saltmarsh, Coastal sand dunes, Coastal vegetated shingle, Machair and Maritime cliff tops and slopes**

The UK has a varied coastline with many different habitat types. Care should be taken when accessing coastal habitats with particular attention being paid to tide times and weather forecasts. Stay away from cliff edges.

Coastal saltmarshes are areas of vegetation inundated by the sea at high tide and are usually dominated by grasses and rushes such as Sea Couch, Creeping Bent and Saltmarsh Rush, along with species such as Sea-milkwort, Thrift and Sea Aster.

You should record plots on the higher vegetated areas, avoiding lower pioneer communities on open mud with samphires and *Spartina* (cord grasses). Be particularly careful of tides and channels when surveying saltmarsh.

Coastal sand dunes include dune grassland, heathland and dune slacks but exclude mobile dunes dominated by Marram Grass (*Ammophila arenaria*). Vegetated dunes ("fixed dunes") have a greater cover of fine-leaved grasses and associated species with abundant flowers such as orchids, clovers, dune pansies and Wild Thyme. Amongst these fixed dunes are lower-lying areas called "dune slacks". These are damp areas that are inundated with water in winter and therefore support different vegetation with marsh orchids and Creeping Willow. Machair is similar to fixed dune grassland but is covered by a separate species list.

Coastal vegetated shingle - Shingle beaches make up about 30% of the UK coastline. These are mostly unvegetated but in some areas the shingle is far enough back from the sea to be colonised by plants, and this is where you should survey. Characteristic plants include Yellow Horned-poppy, Sea-kale and Curled Dock. Areas colonised by scrub, including bramble scrub, should be avoided.

Machair is a type of dune grassland habitat unique to the north west coast of Scotland and the Western Isles where the soils are made up of calcareous shell sand. These soils support grasslands that are rich in wild flower species, such as clovers, marsh and spotted orchids, Yellow-rattle and Harebell. Most traditional machair is either grazed or lightly cultivated; please only survey the grasslands, not any cultivated areas. Areas on peat and areas prone to inundation should also be excluded from this category.

Maritime cliff tops and slopes include grasslands or heathlands that occur on coastal slopes and/or between the cliff edge and usually the first farmed fields inland. These habitats are subject to the effect of salt spray (especially during storms) and include a wide variety of vegetation depending on rock type (acid and basic) and aspect (hot and southerly or cool and northerly). They range from grassland to heath communities with abundant grasses. Typical species include Thrift, Sea Campion, Scurvygrass, Rock Samphire and Primrose. Vegetation growing on sea cliffs should be ignored.

Take extreme care when surveying these areas and only attempt to sample areas that are easily accessible; keep well away from the cliff edge and steep slopes and any areas prone to erosion.

5. **Fresh water** comprising: **Nutrient-poor lakes and ponds, Nutrient-rich lakes and ponds and Rivers and streams**

Survey any water bodies, including ponds, that have a shoreline long enough to accommodate a 25m long plot (if a smaller linear plot is surveyed then please record the length). Rooted marginal and submerged or floating aquatic plants growing within 1m of the water body edge are included, but aquatic plant fragments that have washed up on shorelines should be excluded. Extra care should be taken when surveying these habitats. Please do not enter deep water but survey from the bank edge. Water bodies with fluctuating water-levels such as temporary water bodies (e.g. dew ponds, winterbournes), man-made lakes, reservoirs, saline and brackish lakes or lagoons affected by tides should not be surveyed.

Nutrient-poor lakes and ponds include all water bodies of still water with low nutrients and pH (i.e. peaty lochs, Llyns, lakes, meres and tarns) in the uplands of the north and west of the UK as well as pools on acidic substrates in the lowlands. Bog pools should be recorded under Blanket or Raised bogs. Man-made lakes are excluded.

Nutrient-rich lakes and ponds include all water bodies of still water with moderate to high nutrient levels; in other words the majority of ponds and lakes in lowland areas that are not associated with acidic habitats such as heathland (see Nutrient-poor lakes and ponds). Canals are also included. These waters will usually have abundant (and sometimes luxuriant) plant growth, either fringing the water body or growing in the water itself. Extensive reed-beds may sometimes be present and should be included in this category.

Rivers and streams include the aquatic and emergent vegetation growing on the margins of rivers and streams, including tidal rivers upstream from estuaries. This category excludes small rivulets, runnels, burns, and streams that will not accommodate a 1m wide plot and temporary running waters that only flow for part of the year leaving a dry bed or pools.

6. **Heathland** comprising: **Dry heathland and Dry montane heathland**

Heathlands are dominated by dwarf shrubs, including heathers and Bilberry (Blaeberry), and these usually make up more than 25% of the vegetation cover.

Dry heathland occurs on dry, sandy soil and is dominated by Heather and Bell Heather, usually with Common or Western Gorse. Typically dry heathland occurs in the lowlands often near to the coast, in south west, south east and eastern England and Wales (Gower, Pembrokeshire and Anglesey) as well as on sand dunes in Scotland. It is also found in a mosaic of coastal habitats in Northern Ireland (e.g. Galboly, Co. Antrim) and alongside lowland blanket bog habitats (e.g. Slieve Beagh. Co. Fermanagh). Dry heathland can extend into milder and wetter upland regions of northern England and Scotland where it is more commonly called 'moorland' or 'grouse moor'. As well as Heather and other dwarf-shrubs, characteristic species include Heath Bedstraw, Tormentil and Heath Milkwort.

Dry montane heathland is found on free-draining acid soils at higher altitudes in the north of Wales, England, Scotland and Northern Ireland. It tends to occur in similar places to montane acid grassland i.e. the higher slopes and exposed ridges and summits of mountains but usually where grazing and burning have traditionally been low or in areas less accessible to grazing animals (e.g. rock outcrops, steep slopes). Dry montane heathland is usually dominated by mosses, lichens, Heather, Bilberry (Blaeberry) and Dwarf Juniper that colonise ridges, summits and plateaus of upland areas.

7. **Lowland grassland** comprising: **Dry acid grassland, Dry calcareous grassland, Neutral damp grassland and Neutral pastures and meadows**

Dry acid grassland is found in acid, free-draining rocks and soils in lowland areas including inland 'dunes' (e.g. Murlough Dunes, Co. Down; Wangford Warren, East Anglia). However, these grasslands can extend to upland areas often as rough pasture (with bracken) on valley sides and in some regions across large featureless tracts of open moor, where it has replaced Dry heathland as a result of grazing and burning. Most of these grasslands consist of fine-leaved grasses with species such as bents, fescues, Wavy Hair-grass and Heath Rush, along with Heath Bedstraw, Tormentil and Sheep's Sorrel. Mosses can be common. Dry acid grassland often occurs as a mosaic with heathland and where the cover of Heather or Bilberry (Blaeberry) exceeds 25% the area should be regarded as Dry heathland and the appropriate species list used.

Dry calcareous grassland is found on calcareous soils mainly overlying chalk and limestone in lowland and submontane areas including on limestones up to c.500m altitude in northern England. The very dry, thin soil is low in nutrients and home to many wild flowers and grasses that create species-rich grasslands, especially when grazed by livestock and rabbits. On chalk in England these grasslands are often referred to as 'downland', with characteristic species such as Horseshoe Vetch and Common Rock-rose. This type of grassland also occurs on Carboniferous Limestone in hilly areas of northern England (where it is characterised by Limestone Bedstraw) as well as in Scotland and Wales. Dry calcareous grassland in Northern Ireland typically has thin soils overlying limestone or basalt exposures. Roadside verges in areas of chalk and limestone may also support Dry calcareous grassland. 'Calaminarian grasslands' that have been developed on soils contaminated by heavy-metals during mining activities should be included in this category as well as Juniper scrub on calcareous soils. Occasional scrub can be present in a plot.

Neutral damp grassland includes a range of grasslands on either permanently damp or seasonally flooded soils and on 'heavy' soils with impeded drainage. These include rush pastures that occur throughout the UK but are most prevalent in the wetter north and west of the UK. Wet grassland, usually found in the lowlands often adjacent to or within floodplain meadows, fens, marshes and swamps, sometimes alongside rivers and lakes, as well as on coastal grazing marshes, is also included. On richer soils, the characteristic vegetation consists of coarse grasses and rushes, often with Ragged-Robin and Purple-loosestrife present. In the north and west, such pastures are poorer and more acidic, often dominated by Yorkshire-fog, Tufted Hair-grass and dense rushes. Damp grasslands on more acid soils, such as fen meadows, Purple Moor-grass and rush pastures, should be included under Acidic fens, flushes, mires and springs.

Neutral pastures and meadows occur throughout the lowlands of the UK, extending into upland valleys in northern England and Scotland. They usually occur as enclosed fields managed for hay and/or livestock grazing but sometimes as open commons or village greens and also occur on road verges and riversides where these have been suitably managed. The vegetation is usually rich in grasses such as Crested Dog's-tail and Sweet Vernal-grass and herbs that may typically include Red Clover, Yellow-rattle and Oxeye Daisy. In northern England these meadows (termed Upland hay meadows) are characterised by Wood Crane's-bill and Melancholy Thistle. Hay meadows are not common within the Northern Ireland landscape, however small pockets can be found in Co. Fermanagh.

8. **Marsh and Fen** comprising: **Acidic fens, flushes, mires and springs and Base-rich fens, flushes, mires and springs**

A broad category containing a variety of fen, flush, mire and spring communities that develop on level or sloping peaty ground that is kept wet by flushing or water-level fluctuations close to water courses or the seashore. They extend from sea-level to the tops of our highest mountains. The more acid types include a range of grasslands dominated by rushes and Purple Moor-grass (that have been traditionally referred to as rush-pastures and Purple Moor-grass), fen-meadows, tall-herb fens and mires. Note that the majority of vegetation commonly called marsh or swamp is included in this category.

Acidic fens, flushes, mires and springs occur in areas with acid rocks, most often on slopes in the uplands and mountainous regions but also on slopes around the edges of lakes and in gently sloping valleys in the lowlands. They are similar to bogs, but more species-rich and tend to have surface water moving through them, often due to the presence of springs and subterranean seepages. Carpets of *Sphagnum* mosses and species such as sedges and rushes, butterworts and louseworts may be found.

Base-rich fens, flushes, mires and springs occur in areas with base-rich rocks where there is a significant flow of surface water through them, often due to the presence of springs or subterranean seepages. They often support a wide range of species. This is a broad category including swamps and tall-herb fens in the lowlands, montane flushes and mires and, on our highest mountains, gravelly, sandy or stony substrates colonised by arctic-alpines. These upland flushes are often very open with a carpet of brown mosses and scattered herbs, rushes, sedges and grasses.

9. **Native pinewood and juniper scrub** comprising: **Conifer woods and juniper scrub**

Conifer woods and juniper scrub – Native conifer woods are confined to the Highlands of Scotland where they are dominated by native Scots Pine. The soil is acid and free-draining and typical ground flora species include Heather, Bilberry (Blaeberry), Chickweed-wintergreen and Creeping Lady's-tresses. You should only record from plantations of Scots Pines if they are north of the central belt of Scotland. Yew woodland should be included under Dry deciduous woodland. Juniper scrub is present in Scotland, northern England, Wales and within the Mourne Mountains in Northern Ireland. Juniper scrub on calcareous soils in the lowlands should be recorded as Dry calcareous grassland.

10. **Rock outcrops, cliffs and screes** comprising: **Inland rocks and scree and Montane rocks and scree**

Inland rocks and scree includes all natural or man-made rock exposures including quarries, cuttings, grykes of limestone pavements and screes. These areas can be rich in ferns, especially small ferns such as Wall-rue and Maidenhair Spleenwort. Vegetation on man-made structures such as dams, stonewalls and buildings, should not be surveyed.

Only survey easily accessible areas such as the base of cliffs.

Montane rocks and scree includes vegetation on rock faces and scree at higher altitudes (>600m) on mountains in the Scottish Highlands, northern England, north Wales and within the Mourne Mountains in Northern Ireland. These rocks tend to be acidic in nature, with ferns such as Parsley Fern along with Fir Clubmoss and Bilberry (Blaeberry). More species are usually found on base-rich rocks including saxifrages, mountain willows and Alpine Lady's-mantle.

Only survey easily accessible areas such as the base of cliffs.

11. **Upland grassland** comprising: **Montane acid grassland and Montane calcareous grassland**

Montane acid grasslands are confined to acid, free-draining substrates in submontane and montane zones including the higher slopes and exposed ridges and summits of mountains throughout the UK. They usually occur where grazing and sometimes burning has reduced the cover on sub-shrubs associated with Montane heathland. These alpine and subalpine grasslands are usually dominated by mosses and lichens but include grass-heath species, of which Stiff Sedge (*Carex bigelowii*) is probably the most characteristic. This habitat also includes snow-bed vegetation in mountain corries.

Montane calcareous grasslands usually occur on calcareous soils above 600m on mountains throughout the UK but extend down to sea-level in the north and west of Scotland. They are often species-rich, especially in arctic-alpine species such as Alpine Lady's-mantle and Purple Saxifrage. These grasslands typically occur around calcareous rock-outcrops, on slopes below rock faces, in snow-beds and on soils that are rich in heavy-metals (e.g. serpentine). Related 'Calaminarian grasslands' that have developed on soils contaminated by heavy metals during mining activities are included under Dry calcareous grassland.

Domin scale

Class	1	2	3	4	5	6	7	8	9	10
% cover	<1 1-2 individuals	<1 several individuals	1-4	5-10	11-25	26-33	34-50	51-75	76-90	91-100

- **For a 5x5m square plot a 50x50cm square area is equivalent to 1%.**
- **For a 10x10m square plot a 1x1m square area is equivalent to 1%.**

For a 5x5m plot, if you can only find one individual of a species in your plot then that species will score 1 on the scale. If there are several of a species dotted about the plot, but you can tell that they will not fill a 50x50cm square, then that species will score 2.

A large clump of one species that covers more than one, but no more than four, 50x50cm squares will score 3.

Where you have individual plants from a species scattered around the plot try to imagine them clustered into one corner: how much space, including their leaves, would they occupy?

National Plant Monitoring Scheme

The National Plant Monitoring Scheme (NPMS) is organised and funded by the Centre for Ecology and Hydrology, Botanical Society of Britain and Ireland, Plantlife and the Joint Nature Conservation Committee. The NPMS is indebted to all volunteers who contribute data to the scheme.

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