# Common Standards Monitoring Guidance

for

## Vascular Plant Species

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# Common Standards Monitoring guidance for vascular plant species

## 1 Introduction

This chapter deals with Common Standards Monitoring (CSM) for vascular plants on designated sites, including SSSIs and SACs. It provides guidance on the identification of interest features, attributes, targets and methods of assessment.

## 2 Defining the interest feature

2.1 The vast majority of citations for biological A/SSSIs will name some plant species as occurring on the site. In most cases this serves a descriptive purpose, naming common plants which are distinctive in a particular habitat or community. It is essential to distinguish between this descriptive purpose and situations in which the named species constitute an interest feature in their own right. The guidance in this chapter deals only with those species which qualify as individual notified features or qualify in combination with other vascular plant species according to the *Guidelines for selection of biological SSSIs* (NCC, 1989), or according to similar guidelines that have been used to select ASSIs, or which appear on the Habitats and Species Directive Annex II.

2.2 Sites that have been notified for individual qualifying species are normally easy to identify by their citations. These species will be in the following categories: listed on Schedule 8 of the Wildlife and Countryside Act, Red Data Book (RDB) species, endemic species, non-endemic species threatened in Europe, declining and regionally rare species, microspecies and hybrids. Apart from Schedule 8 species, for which all sites should be selected, sites for these species should additionally have been selected for either population size or for being the only site in an Area of Search (AOS). This extra information will normally be recorded on the citation, further easing the identification of these individually-notified species. Species which qualify according to the Habitats and Species Directive are individual interest features on a SAC.

2.3 Sites that have been notified for a qualifying combination of species can, in some instances, be more complex to identify. Nationally rare and nationally scarce species that do not individually qualify are allocated a score, and the combination of species qualifies if a threshold score is reached. A broadly similar scoring system has also been used to select ASSI sites in Northern Ireland. The species within a combination are not constrained to occur in the same habitat type on a site, and this leads to the combination frequently being split between the various habitats described upon the citation. Supporting documentation for the A/SSSI may be helpful in identifying those cases in which a combination does constitute a notified feature. Any citation that lists either a 'rich flora' or a 'diverse flora' should be carefully considered to determine whether there are sufficient scoring species to reach the qualification threshold. Any citation that refers to the presence of a RDB species, but in which the RDB species does not appear to be individually qualifying, should also be carefully considered. Similarly, citations that refer to a number of nationally scarce species need careful consideration. Those species that are currently identified as scoring species are listed in the tables in Appendix 2, the 'Status' column shows whether they are Schedule 8, RDB or nationally scarce. Further reference may need to be made to Appendix 1, which lists changes in taxonomy for rare species.

2.4 Each A/SSSI citation refers to species according to their rarity and threat status as it was understood at that time. In many cases this may not be the same as is shown in Appendix 2. Citations have not normally been altered to reflect new understanding of a species' status. Therefore, there may be a few instances in which combinations of species are clearly

identified on a citation as a qualifying combination, but which no longer appear to reach the threshold score. In these cases advice should be sought from Country Agency designated sites advisors as to how to proceed.

2.5 Many sites will not possess either individually qualifying species or qualifying combinations of species, despite there being considerable botanical interest present. Richness and diversity do not always equate to the presence of rare and scarce species. In these instances, the most appropriate method for assessing the botanical component of the interest, will normally be to include it as a 'local distinctiveness' attribute used in the assessment of a notified habitat. Local distinctiveness will test the continued presence of notable species, and when combined with an assessment of the associated habitat, will be only slightly different to the methodology described in this chapter. This method will be appropriate for species described as 'local rarities', as opposed to individually qualifying regional rarities (as defined in the selection guidelines). It will also be appropriate to include as 'local distinctiveness', any nationally scarce species that do not form a part of a qualifying combination. Many citations that refer to a 'rich assemblage' will not possess a qualifying combination of species and should be assessed using local distinctiveness attributes. Most references to assemblages refer to ecological groupings, rather than to scoring combinations. Those few sites that may have been designated according to sect. 11.3.7 of the guidelines should be assessed using habitat guidance.

2.6 There may be particular difficulties associated with defining the vascular plant interest feature on older citations. A large proportion of these early SSSIs contain considerable botanical interest. One situation that is likely to be encountered, particularly for individually qualifying species, is that the species itself is not named, as the sites of rare species have been considered sensitive. These species should be readily identifiable, either using the supporting documentation for the citation, or from local knowledge. Similarly, some sites will give as a reason for notification the presence of a rich or diverse flora, without providing details of the species involved. Again, supporting documentation and local knowledge may be used to determine whether there are individually qualifying or qualifying combinations of species, or whether the botanical interest is better considered as a local distinctiveness attribute for a habitat. The Country Agency botanical advisors may be able to provide guidance as to whether a site should be considered to possess a vascular plant interest feature.

## 3 Selection of attributes for vascular plant interest features

3.1 Every species that contributes to a vascular plant interest feature, whether as an individual species feature or as part of a combination, will be assessed using *both* direct *and* indirect attributes. Both sets of attributes are regarded as essential to ensure the maintenance of viable populations of the plant species on the site. Examples exist in which either the habitat has been maintained but the species has declined (probably due to ecological requirements yet to be discovered), or where the species is still present but the habitat is in an unfavourable condition (usually this involves long-lived species, but not always).

3.2 Direct attributes will include, as a minimum, the presence or absence of the named species. In many cases this may be considered sufficient as providing evidence that the feature retains the ability to respond to the state of the habitat. In other instances staff may feel that there is a need for increased confidence in the long-term viability of the population; depending on the species, this may involve either counts of individuals or extent of the colony. In some instances it is also desirable to measure the regeneration potential of the species, since populations of some long-lived species may remain stable, but no longer be capable of successfully regenerating. The measurement of direct attributes is likely to be provided by a variety of groups: by agency staff, by specialist contractors, and by co-ordination with

voluntary groups or other organisations. However, the final condition assessment for the feature cannot be made until measurements of direct attributes have been supplied.

3.3 Indirect attributes will include measures of the habitat requirements of the individual species. In many cases these assessments will already be necessary for the site for the assessment of notified habitat interest features. In these cases assessment of the condition of vascular plant interest features can be made by simply combining the assessment for the condition of the habitat with assessment of direct attributes. For certain species, the ecological requirements do not coincide with any of the habitats for which guidance is being produced. In these instances, indirect attributes have been identified appropriate for the plant species, and these attributes can be found in the tables supplied in this chapter. The difficulty of accurately assessing every possible habitat that a plant species can occur in may mean that there are a few sites for which the provided guidance seems inappropriate. If the indirect attributes appear not to apply to the site, and no alternative habitats are suggested in the tables, then it will be necessary to contact the Country Agency botanical specialists for site-specific guidance.

## 4 Using the tables to identify attributes and targets

4.1 The vascular plant interest features that are identified on a site will consist of either a single named species or a group of named species. The vast majority of these species will appear in the tables in Appendix 2. These tables can then be used to identify the appropriate attributes for the species.

4.2 The tables consist of all species that are currently designated as either RDB or nationally scarce according to Stewart *et al.* (1994) and Wigginton (1999). Those species that appear on Schedule 8 of the Wildlife and Countryside Act, and hence will always individually qualify on sites where they occur, are indicated. The Northern Ireland species in the tables are those that are rare or scarce in an Irish or NI context. Some of these will be Schedule 8 species (Wildlife (NI) Order 1985). Many of these do not require detailed monitoring in Great Britain. Species which are listed in the country column as only for 'NI' should not usually be monitored in Great Britain. The tables list every species which is currently allocated a score in scored combinations.

4.3 Certain individually qualifying species may not be designated as either RDB or nationally scarce. These include species which qualify following sects. 11.3.4, 11.3.5, 11.3.6 and 11.3.8 of the selection guidelines. Whenever it has been possible to predict these species they have been added to the tables. These species have been added *in italics* to indicate that they should only be monitored when *individually* qualifying on a site, and not as part of a combination. This distinction should be clear from the citation. There may be further species that individually qualify and which have not been added to the tables. If it is clear from the citation that the species is *individually* notified, advice should be sought from the Country Agency botanical specialists on how to monitor the species. Microspecies in the genera *Hieracium*, *Taraxacum*, and *Rubus* have not been included in the tables in Appendix 2 (with the exception of *Hieracium* Sect. *Alpestria*), advice must be sought on any citation which includes these as notified species.

4.4 The RDB and nationally scarce lists have undergone considerable modification since the publication of the SSSI selection guidelines. Some of these changes have been taxonomic, and a list of the changes affecting RDB species can be found in Appendix 1. Species occurring on a citation and missing from the tables in Appendix 2 should be checked against the Appendix 1 list to determine whether the species is present under a different name. The taxonomy used in Appendix 2 is that of the New Atlas of the British and Irish Flora (Oxford,

2002). A useful reference for many synonyms is the List of Vascular Plants of the British Isles (BSBI, 1992).

4.5 There have also been changes to the RDB and nationally scarce lists regarding the status of species. A number of neophyte taxa have been removed from the RDB list since the publication of the SSSI selection guidelines. These taxa *may* individually qualify on a few sites, in which case the Country Agency botanical specialists will need to advise on monitoring guidance. In particular, the status of *Equisetum ramosissimum* and *Alyssum alyssoides* is under review, and monitoring guidance for these two species has not been provided. Generally, rare neophyte taxa are difficult to monitor as they tend to be casual and ephemeral. When considering scored combinations of species, it is first necessary to determine whether the cited species reach a threshold of 200, if only those species occurring in Appendix 2 are counted (Schedule 8 scores 200, RDB scores 100, nationally scarce scores 50, see status column). If the threshold is reached, then only those species that are listed in Appendix 2, and hence are considered of current interest for monitoring, should be included in the monitored combination. If the threshold is not reached, but it is clear from the citation that a scored combination is a notified feature, then advice from the Country Agency site designation advisors should be sought. Sites with a 'rich flora', but which do not reach the threshold using Appendix 2, may be assessed using local distinctiveness attributes for the habitat.

4.6 Once the appropriate Appendix 2 species have been located in the tables, it is possible to extract the appropriate attributes to monitor the species. Those species for which an 'H' appears in the 'Habitat' column should have their indirect attributes assessed using the habitat guidance described in other chapters of this manual. In most cases these attributes will already be being assessed as part of a notified habitat on the site, in which case there is no need to repeat the assessment, but it must be consulted to help determine the condition of the species interest feature. Eventually it is hoped to include in the Appendix 2 table a cross-referencing to the exact habitat guidance that should be used, in the meantime, details of NVC communities are provided in the final column. A few of these species need slight alterations to the general habitat guidance in order to make it appropriate for their individual requirements. These alterations are listed by species in Appendix 3. Direct attributes will also need to be assessed for these species; these are discussed in sect. 5 below and a table is provided as Appendix 6.

4.7 Species for which a number appears in the fourteen 'suite' columns should be assessed using the guidance tables in Appendix 4. The number represents the suite of species to which an individual species has been allocated. The species within each suite grow in broadly similar habitats, but the habitats in question do not possess their own generic guidance chapter. Each suite has had both appropriate indirect and appropriate direct attributes assigned to it, although for further guidance on the selection and measurement of direct attributes sect. 5 below should be consulted.

4.8 Those species which possess a 'z' in the final 'individual' column have had their own individual guidance tables produced. These are in Appendix 5. These species have specialised ecological requirements which could not be easily accommodated in either habitat guidance or suite guidance. Detailed descriptions of indirect attributes are provided. In some instances direct attributes are also described, in other instances direct attributes should be selected after consulting sect. 5 below. The Appendix 6 table may also be appropriate for these species.

4.9 Some species have additional 'x's in the suite columns or in the Habitat column. These species are not restricted to a single habitat type, but can occur successfully in a variety of habitats. The 'x's represent the secondary habitats in which these species can occur. If the

principal listed habitat or suite does not appear appropriate for the site in question, then the alternative guidance can be used to produce suitable attribute tables.

## 5 Measurement of direct attributes

5.1 A direct attribute must be measured for every monitored species before condition assessment can be made. Measurements of direct attributes require botanical skills that some field staff may not consider that they possess. The balance between using agency staff, specialist contractors and co-ordination with other organisations will be determined by the country agencies. In order to facilitate the division of the work between different groups, the direct and indirect attributes have been clearly divided in the guidance tables. Dividing the work does not imply that the attributes are discretionary.

5.2 When it has been decided to divide the assessment into a direct assessment and an indirect assessment carried out by different personnel, it is important to consider co-ordinating the timing of the two assessments. Ideally, both assessments would be carried out in the same field season. This is unlikely to be feasible in every case, particularly if voluntary schemes are used as data sources for the direct attributes, or if there are a considerable number of species in the scored combination. As a rule, all the assessments for a single interest feature on a site should be completed within a three-year period. Note that for a scored combination this would include direct assessments of all of the scored species. If a species is not found within the three-year period, but is found *subsequently* within the six-year reporting cycle, then this assessment may be used.

5.3 In a considerable number of cases, it may prove unnecessary for agency staff to assess direct attributes, as the data will already be being collected by other organisations or schemes. All of the plant species listed in Appendix 2 are of considerable interest to conservation organisations. For any site that is run as a nature reserve by the Wildlife Trusts, RSPB, National Trust, or Plantlife, the wardens of the reserve may already collect data on direct attributes. Plantlife collect data on all plants included in their 'Back from the brink' scheme; a list of these plants can be found on the Plantlife website (http://www.plantlife.org.uk/). The Botanical Society of the British Isles collects records of all British and Irish vascular plants, and particularly of threatened plants, as part of the Threatened Plant Database project. They maintain a network of vice-county recorders who may already be monitoring rare plants within their area. Local groups, such as the Ashmolean Natural History Society Rare Plants Group, may also possess useful data. It is hoped eventually to set up a 'Rare Plants Unit', which will be able to co-ordinate all of these disparate data sources, and hence considerably simplify the collection of information on direct attributes.

5.4 The minimum target for a direct attribute is assessing whether the species is still present on the site. This must be assessed in every case. The use of further direct assessments is at the discretion of the individual Country Agencies, and may be included to increase confidence in the long-term viability of the feature. One situation in which this extra confidence may be considered to be particularly desirable is when the site is considered to be a 'stronghold' for the species in question. Therefore, further direct measures are most necessary for individually notified species. Appropriate discretionary targets and measures are described in sects. 5.5-5.8.

5.5 If a baseline survey of a species has been completed for a site, then it may be possible to subdivide the site into sectors. The attribute that would be assessed would be the presence of the species in the various sectors, and the associated target would be to maintain the species present in a certain number of the identified sectors. This is referred to as a 'spatial target'. This approach is particularly useful for large and complex sites. Possible targets would be for

a species to be present in a specified number of dune-slacks or cliff-ledges. Subpopulations on the edge of the site are very helpful for assessing the overall condition of the feature, as these subpopulations are frequently the first to disappear if the condition of the feature is declining.

5.6 In addition to monitoring the presence of a species it can be useful to have a measure of the population size. This can be used in conjunction with spatial targets described above, or in their place if the site cannot readily be divided into sectors. Assessments of population size are less appropriate for annual species that undergo large population fluctuations. The exact method used to assess population size varies with the habit of the species. When assessing species that spread vegetatively and tend to grow in large clonal swarms, as some grasses, the *extent* and *number* of the subpopulations are the appropriate measures. For species that grow as clearly identifiable individuals, the number of individuals will be an appropriate measure. Census counts can be used up to about 100, and thereafter abundance categories following a broken logarithmic scale can be used (101-300, 301-1000, 1001-3000, 3001-10000, >10000). For large populations, a count can be made for a small part of the population, and then extrapolated to provide an estimate for the entire population.

5.7 The assessment of population size is important for ensuring either the maintenance of viable populations in sites where the population has always been small, or the maintenance of large populations in sites which are strongholds for the species. Targets should be set so as to ensure either a minimum viability, or to maintain larger populations in strongholds. It is hard to determine the size of the minimum viable population, and care must be taken not to set aspirational targets. The population must be sustainable and viable and this may require the population to be *larger* than in the original baseline survey, but targets should not usually be set to produce a population larger than that which is minimally sustainable. Generally, any population containing fewer than fifty individuals should be carefully considered to determine whether management could improve the population size. Many individually-notified species occur in sites which were also selected for their large population size, and hence act as strongholds. Larger populations will be assessed using abundance categories on a broken logarithmic scale. Targets should be set such that the population does not decline by more than one abundance category, the logarithmic scale employed should be sufficient to cover natural fluctuations. Species that are known to fluctuate widely in numbers should, ideally, be assessed in more than one season during the recording cycle; this will particularly apply to annual species.

5.8 In some cases it will be appropriate to make an assessment of regeneration potential, as the most robust measure of population viability. Ideally, evidence of successful regeneration should take the form of a colony exhibiting an adequate range of young and old plants. Such an assessment can be difficult to achieve, and hence there are a range of other measures that can be used to assess regeneration potential. The other measures can be placed in order of significance: young plants, seedlings, full seed heads and flowers. By producing an abundance estimate of e.g. full seed heads, it may be possible to assess both population size and regeneration potential using just one measure. A few of the species tables, for instance the one for *Arabis alpina*, indicate exactly which measures of regeneration potential should be used. However, for most species it is possible to select the most appropriate measure given the time of year that the site is visited. The species tables give some guidance as to the flowering time for the species; however, flowering can be both transient and unpredictable, and condition assessments can almost always be made outside of flowering times. If the timing of the visit is correct, counts of flowering plants can be the easiest to produce, since they are often the easiest to find and identify. Target setting for such a count will have to consider the possibility of large fluctuations, and the possibility of no flowers being produced by small populations in unfavourable seasons.

5.9 The assessment of direct attributes requires detailed knowledge of the locations of populations on a site. For individually-notified species this assessment should have been made at the time of designation. However, it is recognised that in some instances these data are inadequate. Whenever possible a baseline survey should be carried out on a site in order to provide data to inform target-setting and to simplify future monitoring cycles. Sketch maps may be sufficient, particularly if used in conjunction with GPS measurements. The limits or thresholds for a species distribution might have to be measured in relation to permanent markers or fixed points, or it may be possible to use natural boundaries for measurements.

5.10 An example of selection of direct attributes and target setting for these attributes is shown in Box 1:

**Box 1. Case study: Fen orchid (*Liparis loeselii*)**

**Background**

A distinctive broad-leaved form (var. *ovata*) of the fen orchid, *Liparis loeselii*, occurs in the larger dune systems alongside the Bristol Channel - in Braunton Burrows in Devon and Kenfig, Crymlyn and Whiteford in Glamorgan and Pendine in Carmarthenshire. At all these sites the populations have undergone serious recent declines and there have been several historical extinctions elsewhere. Nearly all these extant sites for the species are now on SSSIs and several are designated NNRs, which has given access to experimental management and research. Some very detailed surveillance of fixed plots at Kenfig and Whiteford NNRs has revealed many aspects of the life-cycle, including the vast over-production of seed, its dormancy in wet sand, the need for bare sand in germination and frequency of small (>2mm) pseudobulbs in early-successional slacks (characterised by cover-abundance of thalloid liverworts and associated vascular plants and the absence of late-successional species). All attempts to quantify these stages of the life-cycle turned out to be highly time-consuming (up to 7 hours for a count of pseudobulbs in a 2 x 2 m quadrat) and even counts of leafy non-flowering plants proved subject to wide variation. The numbers of flowering spikes, however, turned out to be very repeatably measurable and, crucially, representative of other more cryptic stages in the life-cycle.

**Rationale**

The spatial target for this species can be defined in terms of its presence / absence in distinct dune-slacks and its overall abundance by counts of flowering-spikes in the population. It is possible to characterise the suitable habitat for *Liparis* regeneration in terms of associated species abundance.

**Example**

At Kenfig the requirement would be for *Liparis* to be present in >15 discrete dune slacks, which ensures that the species is well distributed. In good years, flowering spikes can be numerous in suitable habitat, and counts of >200 spikes per dune slack should be obtained quickly (c. <20 minutes) for some of the slacks. This part of the objective will ensure that at least three sizeable dune slacks persist in optimum condition for flowering *Liparis*.

Successionally-young dune slacks will hold fewer flowering spikes, but will ensure that there is scope for more optimum flowering habitat in the future.

Most of the slacks at Kenfig are now beyond the optimum age for flowering *Liparis*, however, the presence of at least five flowering spikes in these older slacks indicates that the habitat is still capable of supporting a large vegetative population, comprised largely of bulbs and tiny seedlings. Periodic mowing should allow the species to persist vegetatively.

| **Conservation objective** | **To maintain the *Liparis loeselii* population at Kenfig cSAC in favourable condition where, at least one year during the reporting cycle:** | |
|---|---|---|
| **Presence/absence: extent** | Lower limit | *Liparis* is present in >15 discrete dune slacks |
| **Successful regeneration** | Lower limit | The number of flowering *Liparis* spikes is<br><br>>200 in at least three humid slacks and<br><br>>20 in a successionally-young humid dune slack and |

| | | |
|---|---|---|
| | | >5 in >11 other humid dune slacks |
| **Site-specific habitat definitions** | | |
| **Humid dune slack vegetation** | Moist vegetation on level ground between sloping dunes, typically with *Salix repens* present. | |
| **Successionally-young humid dune slack** | Humid dune slacks where >50% of the habitat has:<br><br>>50% bare soil or thalloid liverworts cover within a 50 cm radius; and<br><br>>3 of *Carex viridula ssp. viridula, Juncus articulatus, Anagallis tenella, Samolus valerandi, Eleocharis quinqueflora, Ranunculus flammula, Liparis loeselii*, are present within a 50cm radius and:<br><br>*Phragmites australis, Molinia caerulea, Calamagrostis epigejos* are absent within any 1m radius | |

## 6 Assessing the condition of individually-notified species

6.1 Species that can be individually notified are in the following categories: listed on Schedule 8 of the Wildlife and Countryside Act, Red Data Book species, endemic species, non-endemic species threatened in Europe, declining and regionally rare species, microspecies and hybrids. Most of these species will be present in the tables in Appendix 2. Guidance will be added to these tables for any other individually-notified species once those species have been identified. Most of the citations should additionally contain information regarding the population size. The tables in Appendix 2 should be consulted in order to determine the appropriate indirect attributes. The methods for extracting these attributes were described in sect. 4 above.

6.2 Habitats for which guidance exists in other chapters in this manual should be assessed according to the guidelines explained in those chapters. There are a few cases where there are specific slight alterations to the general habitat guidelines, these are listed in Appendix 3. The usual assessment method will take the form of a structured walk through the site, assessing the attributes at a number of points during the course of this walk.

6.3 It is suggested that other habitats, including those described in the suites and those of individual species, should also be assessed using a structured walk whenever possible. The whole extent of potentially suitable habitat present on the site should be considered whenever feasible, even if the plant is only present in a small area of this habitat. This should provide a measure of the potential of the plant to spread to new areas within the site.

6.4 The exact form of the structured walk will vary from site to site, but, in general, aiming to assess ten evenly-spaced stops will be adequate. Whenever possible, the known populations of the plant species should be represented in the assessed stops. The route of the walk and the positions of the stops should be recorded on a sketch map so as to facilitate future surveys. Notes on all of the indirect attributes should be made at each stop.

6.5 The stops are not a formal statistical sample, and the final condition assessments of the attributes are not intended to be averaged over the stops. Each stop should contribute to the assessor's overview of the habitat, and the notes made will be important in making the final assessment. When making the final assessment, greater weight should be placed on the stops at which it is known the plant species occurs. If these are favourable, whilst all others are unfavourable, consideration should be given to whether this number of sites within the habitat is sufficient for a viable population.

6.6 Direct attributes will normally be assessed by visiting the known areas for species populations. Targets should be set which are appropriate for the species, the site, and for the subpopulations known to occur on the site. Assessed populations should be marked on a sketch map, and ideally a GPS measurement made, to facilitate future surveys. If possible, the remaining suitable habitat should be walked through to determine whether further populations are present. When making the final assessment, the state of the species on the entire site should be considered. This may mean that some subpopulations could have been lost, although if targets have been set regarding the maintenance of subpopulations in particular sectors of the site then these targets must be met for the species to be in a favourable condition.

6.7 If all of the indirect attributes meet their targets but the species cannot be found on the site, then the Country Agency botanical specialists must be informed. The specialists will then make the final decision on the condition of the feature. A number of situations exist, particularly for cryptic, ephemeral or dynamic species, in which specialists may judge it acceptable that a species is not found.

6.8 The final assessment of the species interest feature will be produced by combining the information from the direct and indirect attributes. The conclusion must be one of the following:

6.8.1 Favourable maintained. All attributes, both direct and indirect, meet targets in current assessment, and previous assessment favourable.

6.8.2 Favourable recovered. All attributes, both direct and indirect, meet targets in current assessment, and previous assessment unfavourable.

6.8.3 Unfavourable recovering. At least one attribute does not meet target in current assessment. Either the direct or the indirect attributes or both can be perceived to be recovering as compared to previous assessment. The feature may also be considered to be recovering if positive management is in place, even if no measured attributes are improving, as long as the assessor is confident that the management will eventually produce favourable status.

6.8.4 Unfavourable no change. At least one attribute does not meet target in current assessment. No clear evidence of recovery or decline. This conclusion is appropriate if the direct and indirect attributes give differing estimates of recovery and decline.

6.8.5 Unfavourable declining. At least one attribute does not meet target in current assessment. Either the direct or the indirect attributes or both can be perceived to be declining as compared to previous assessment.

6.8.6 Partially destroyed. This conclusion could be used if some subpopulations of the species had been destroyed along with their habitat, but leaving sufficient on the site to allow for recovery to a viable population level. It would not be an appropriate conclusion if a part of the suitable habitat which had never supported the species had been destroyed. This could be considered either favourable (if sufficient habitat remained for the species to maintain a viable population), or unfavourable.

6.8.7 Destroyed. This conclusion could be used if the species was no longer present on the site and the habitat had been lost. If the habitat is still present and in a good condition then it will be necessary to consider whether there is any possibility of the species returning to the site, including *via* species reintroduction programmes. If the possibility remains, then the feature will be unfavourable and not destroyed.

## 7 Assessing the condition of scored combinations of species

7.1 All species that are currently allocated a score in scored combinations are listed in the tables in Appendix 2. All species that qualify for a score should be identified for a site using the

citation and supporting documents. In some cases, when a 'rich flora' is the sole information possessed, a baseline survey to identify scoring species may be advisable. It is vital for scored combinations that both the 'Country' column and the 'Status' column are consulted to ensure that the score is known and that species are only monitored in relevant countries. Those species that appear in italics should *not* be assessed as parts of scored combinations. The tables should be used as previously described to extract *all* the relevant indirect attributes for *every* scored species.

7.2 In many cases it will be found that all of the species in the scored combination occur in the same habitat, and hence have the same set of indirect attributes. In these cases, only one assessment of the indirect attributes will need to be made following the methods described in sects. 6.2-6.5. However, if multiple habitats are involved, each habitat must be assessed separately using the appropriate set of indirect attributes. These separate assessments will all be taken into account when making the assessment of the scored combination interest feature.

7.3 Direct attributes may be assessed by visiting the known areas for species populations, however there are likely to be a considerable number of sites for which the exact location of every species is unknown. Appropriate habitats should be surveyed, and any populations found should be marked on a sketch map, ideally with a GPS measurement, to facilitate future survey work. Any extra scoring species that are found on the site during survey work should be noted, and may be added to the scoring combination in future assessments.

7.4 The final assessment for the scored combination will need to take into account all of the indirect and direct assessments, of which there could be a considerable number. Particular consideration must be paid to the question of how to combine the direct assessments for all of the species. All indirect assessments should be favourable for the combination feature to be favourable.

7.5 The qualifying threshold for a scored combination is 200, and this minimum threshold of species present *must* be maintained for the feature to be favourable, although the absence of species if the indirect targets are all met should be reported to specialists as described in sect. 6.7. Therefore, if some of the species in the combination could not be found, such that the remaining species had a total score of less than 200, then the feature is *not* favourable.

7.6 The richest sites will have a score considerably higher than 200, and it would be completely unacceptable to allow the score to fall to this level before the feature was considered to be in an unfavourable condition. The use of a 'qualifying standard' is not acceptable as the only means to judge the condition of scored combinations. Whilst it is theoretically possible to set a higher target score for rich sites, this is not the method that is recommended in this guidance. It should be noted that it is *only* nationally rare and nationally scarce species that are allocated a score, and that all of these species are of considerable conservation concern. Further, plants, as sessile organisms, do not tend to rapidly colonise new sites. Therefore, it is considered that it is the named species making up the scored combination that are of interest, and not the combination *per se*. Whilst it is possible for new scoring species to be discovered on a site due to increased survey effort, it is unlikely that many new species will be found due to colonisation. Therefore, new scoring species should be considered as an addition to the scored combination, and *not* as a replacement for lost species.

7.7 The decision regarding how many species making up a combination should be directly assessed will need to be made on a site-by-site basis. The following guidelines are suggested:

- For smaller sites, on which a complete survey is plausible, direct attributes should be assessed for all the scoring species
- For larger sites, on which it may not be possible to find all the scoring species in a limited time, it may be acceptable to only assess the direct attributes for a proportion of the

scoring species (this should be made clear when defining the attributes and targets for the specific site in question)
- Schedule 8 and RDB species forming part of a combination should always be directly assessed (therefore if such a species is not found in a monitoring cycle the combination will be reported as unfavourable)

If the surveyor has not been able to re-find a scoring species on the site, particular attention should be paid to alternative data sources. Any record of species presence during the reporting cycle might be accepted as 'favourable direct attributes' for a species in a scored combination.

7.9 The possible conclusions are:

7.9.1 Favourable maintained. All of the indirect attributes for all of the relevant habitats meet their targets, and an appropriate number of direct attributes meet their targets. Previous assessment favourable.

7.9.2 Favourable recovered. All of the indirect attributes for all of the relevant habitats meet their targets, and an appropriate number of direct attributes meet their targets. Previous assessment unfavourable.

7.9.3 Unfavourable recovering. Either one of the indirect attributes does not meet its target or an insufficient proportion of direct attributes meet their targets. Either the habitats are recovering or more direct attributes met their targets than in the previous assessment. The feature may also be considered to be recovering if positive management is in place, even if no measured attributes are improving, as long as the assessor is confident that the management will eventually produce favourable status.

7.9.4 Unfavourable no change. Either one of the indirect attributes does not meet its target or an insufficient proportion of direct attributes meet their targets. No clear evidence of recovery or decline. This conclusion is appropriate if the direct and indirect attributes give differing estimates of recovery and decline.

7.9.5 Unfavourable declining. Either one of the indirect attributes does not meet its target or an insufficient proportion of direct attributes meet their targets. Either the habitats are declining or fewer direct attributes met their targets than in the previous assessment.

7.9.6 Partially destroyed. This conclusion will be appropriate if one or more of the component habitats have been destroyed with their associated scoring plant species, but leaving a valid scoring combination on the rest of the site. It would also be appropriate if one of the scoring species had *permanently* been lost from the site, leaving a valid (above threshold) scoring combination, but in which the scoring combination would be judged unfavourable due to an insufficient proportion of direct attributes meeting their targets (e.g. in small sites where all direct attributes should meet their targets). It would not be an appropriate conclusion if a part of the suitable habitat which had never supported the plant species had been destroyed.

7.9.7 Destroyed. This conclusion could be used if sufficient species had been permanently lost from the site along with their habitats, such that there was no longer a valid scoring combination remaining and there was no chance of reinstatement.

## 8 Materials required for monitoring

8.1 The initial assessment of the citation will require:
- A/SSSI citation
- Additional baseline data and plant surveys
- CSM tables
- Up-to-date taxonomy guide e.g. Kent (1992) or Stace (1997)

8.2 In addition to standard equipment, monitoring in the field will require:

- Map of site for navigation and annotation
- Baseline survey data
- Tape measure
- GPS unit
- Camera to help record locations
- Up-to-date flora, preferably Stace (1997)
- Hand-lens
- CSM field recording forms

## 9 Further reading and bibliography

Joint Nature Conservation Committee (1998). A statement on common standards monitoring. JNCC, Peterborough.

Kent, DH (1992). List of vascular plants of the British Isles. BSBI, London.

Nature Conservancy Council (1989). Guidelines for the selection of biological SSSIs. NCC, Peterborough.

Preston, CD, Pearman, DA and Dines, TD (2002). New Atlas of the British and Irish Flora. OUP, Oxford.

Stace, CA (1997). New Flora of the British Isles. CUP, Cambridge.

Stewart, A, Pearman, DA and Preston, CD (1994). Scarce plants in Britain. JNCC, Peterborough.

Wigginton, MJ (1999). British Red Data Books 1 Vascular plants, 3rd Edn. JNCC, Peterborough.

## 10 Appendices

Appendix 1. Changes in taxonomy affecting RDB species.
Appendix 2. Tables of individually qualifying and scoring species.
Appendix 3. Species that require modifications to habitat guidance.
Appendix 4. Attributes and targets tables for species suites 1-14.
Appendix 5. Attributes and targets tables for species with individual guidance.
Appendix 6. Table of direct attributes and targets for species monitored using habitat guidance.
Appendix 7. Examples of individually-notified species interest features.
Appendix 8. Example of scored combination interest feature.

## Appendix 1. Changes in taxonomy affecting RDB species

| Name in citation: | Appears in Appendix 2 as: |
|---|---|
| Alchemilla gracilis | Alchemilla micans |
| Allium babingtonii | Allium ampeloprasum |
| Arabis stricta | Arabis scabra |
| Asparagus prostratus | Asparagus officinalis subsp. prostratus |
| Bromus madritensis | Anisantha madritensis |
| Buglossoides purpurocaerulea | Lithospermum purpureocaeruleum |
| Calamagrostis purpurea | Calamagrostis purpurea ssp phragmitoides |
| Calamintha sylvatica | Clinopodium menthifolium |
| Carex tomentosa | Carex filiformis |
| Cerastium arcticum subsp. edmondstonii | Cerastium nigrescens |
| Chenopodium botryodes | Chenopodium chenopodioides |
| Cotoneaster cambricus | Cotoneaster integerrimus |
| Dactylorchis traunsteineri | Dactylorhiza traunsteineri |
| Dactylorhiza incarnata var. ochroleuca | Dactylorhiza incarnata ssp ochroleuca |
| Diphasiastrum issleri | Diphasiastrum complanatum |
| Epipactis dunensis | Epipactis leptochila |
| Euphrasia eurycarpa | Euphrasia ostenfeldii |
| Festuca caesia | Festuca longifolia |
| Festuca glauca var. caesia | Festuca longifolia |
| Filago apiculata | Filago lutescens |
| Filago spathulata | Filago pyramidata |
| Fumaria martinii | Fumaria reuteri |
| Galium debile | Galium constrictum |
| Geranium purpureum subsp. forsteri | Geranium purpureum |
| Geranium purpureum subsp. purpureum | Geranium purpureum |
| Halimione pedunculata | Atriplex pedunculata |
| Helianthemum canum | Helianthemum oelandicum ssp incanum |
| Helianthemum canum subsp. levigatum | Helianthemum oelandicum ssp levigatum |
| Hieracium spp. | Seek advice |
| Hypericum linarifolium | Hypericum linariifolium |
| Juncus mutabilis | Juncus pygmaeus |
| Juncus nodulosus | Juncus alpinoarticulatus |
| Leucojum aestivum | Leucojum aestivum ssp aestivum |
| Limonium binervosum | Review on taxonomy - seek advice |
| Luzula pallescens | Luzula pallidula |
| Lythrum hyssopifolia | Lythrum hyssopifolium |
| Muscari atlanticum | Muscari neglectum |
| Nardurus maritimus | Vulpia unilateralis |
| Ophrys holoserica | Ophrys fuciflora |
| Orobanche loricata | Orobanche artemisiae-campestris |
| Orobanche picridis | Orobanche artemisiae-campestris |
| Polygala amara | Polygala amarella |
| Polygala austriaca | Polygala amarella |
| Polygonum dumetorum | Fallopia dumetorum |
| Pyrola rotundifolia | Check subsp. in New Atlas |
| Rhinanthus serotinus | Rhinanthus angustifolius |
| Rhynchosinapis wrightii | Coincya wrightii |
| Rubus spp. | Seek advice |
| Sagina intermedia | Sagina nivalis |
| Scirpus holoschoenus | Scirpoides holoschoenus |
| Scirpus triqueter | Schoenoplectus triqueter |
| Scirpus triquetrus | Schoenoplectus triqueter |
| Taraxacum spp. | Seek advice |
| Turritis glabra | Arabis glabra |
| Veronica spicata | Check subsp. in New Atlas |
| Vulpia ambigua | Vulpia ciliata ssp ambigua |
| Vulpia membranacea | Vulpia fasciculata |

## Appendix 2. Tables of individually qualifying and scoring species

Species in **bold** are listed in Annex II of the Habitats and Species Directive. Species or countries in *italics* should only be monitored when individually-notified, not as part of a combination. Entries in the status column show: blank – nationally scarce, R – Red Data Book, 8 – Schedule 8.

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aceras anthropophorum | Man orchid | E | | | | | | | | 3 | | | | | | | | | | | | | | CG2-3 |
| Aconitum napellus | Monk's-hood | E | | W | | | H | | | | | | | | | | | | | | | | | W |
| Actaea spicata | Baneberry | E | | | | | H | | | | | | | | | | | | | | | | | W9 |
| Adiantum capillus-veneris | Maidenhair fern | E | | W | | | H | | | | | | | | | | | | | | | | | |
| Adonis annua | Pheasant's eye | E | | | | R | | | | | | | | | 8 | | | | | | | | | OV |
| Ajuga chamaepitys | Ground-pine | E | | | | 8 | | | | | | 5 | | | x | | | | | | | | | OV15 |
| Ajuga pyramidalis | Pyramidal bugle | E | S | | NI | | H | | | | | | | | | | | | | | | | | H7, CG10 |
| Alchemilla acutiloba | Lady's mantle | E | | | | R | H | | | | | | | | | | | | | | | | | MG3 |
| Alchemilla glaucescens | Lady's mantle | E | S | | | R | H | | | | | | | | | | | | | | | | | CG13 (CG9, CG10) |
| Alchemilla glomerulans | Lady's mantle | E | S | | | | H | | | | | | | | | | | | | | | | | MG3 |
| Alchemilla micans | Lady's mantle | E | | | | R | H | | | | | | | | | | | | | | | | | CG, MG |
| Alchemilla minima | Lady's mantle | E | | | | R | H | | | | | | | | | | | | | | | | | CG9 |
| Alchemilla monticola | Lady's mantle | E | | | | R | H | | | | | | | | | | | | | | | | | MG3 |
| Alchemilla subcrenata | Lady's mantle | E | | | | R | H | | | | | | | | | | | | | | | | | MG3 |
| Alchemilla wichurae | Lady's mantle | E | S | | | | H | | | | | | | | | | | | | | | | | MG3, CG10-11 |
| Alisma gramineum | Ribbon-leaved water-plantain | E | | | | 8 | | | | | | | | | | 10 | | | | | | | | A |
| Alisma lanceolatum | Narrow-leaved water-plantain | | | | NI | | H | | | | | | | | | | | | | | | | | Reed and swamp |
| Allium ampeloprasum | Wild leek | E | | W | | | | | | | | | | | | | | | | | | | z | SD6, OV5 |
| Allium schoenoprasum | Chives | E | | W | | | | | | | | | | | | | | | | | | | z | H6-7, MC5, MC9, OV34 |
| Allium sphaerocephalon | Round-headed leek | E | | | | 8 | | | | | | | | | | | | | | 12 | | | | |
| Alopecurus borealis | Alpine foxtail | E | S | | | | H | | | | | | | | | | | | | | | | | M32-33 |
| Alopecurus bulbosus | Bulbous foxtail | E | | W | | | | | | | | | | | | | | | | | | 14 | | SM16, MG13 |
| Althaea hirsuta | Rough marsh-mallow | E | | | | 8 | | x | | | | 5 | | | x | | | | | | | | | CG, OV |
| Althaea officinalis | Marsh-mallow | E | | W | | | | | | | | | | | | | | | | | | 14 | | |
| Anagallis minima | Chaffweed | | | | NI | | | | | | | 5 | | | | | | | | | | | | |
| Andromeda polifolia | Bog-rosemary | | | | NI | | H | | | | | | | | | | | | | | | | | Raised bog |
| Anisantha madritensis | Compact brome | E | | W | | R | | | | | | | | | | 9 | | | | | | | | |
| Apera interrupta | Dense silky-bent | E | | | | | | | | | | x | | 7 | x | | | | | | | | | OV |
| Apera spica-venti | Loose silky-bent | E | | | | | | | | | | | | | 8 | x | | | | | | | | OV5 |
| **Apium repens** | **Creeping marshwort** | **E** | | | | **8** | | | | | | | | | | | | | | | | | **z** | **MG** |
| Arabis alpina | Alpine rock-cress | | S | | | 8 | | | | | | | | | | | | | | | | | z | |
| Arabis glabra | Tower mustard | E | | | | R | | | | | | | | | | 9 | | | | | | | | |
| Arabis petraea | Northern rock-cress | | S | W | | | | | | | | | | | | | | | | | 13 | | | CG14 |
| Arabis scabra | Bristol rock-cress | E | | | | 8 | | | | | | | | | | | | | | 12 | | | | CG1 |
| Arctostaphylos alpinus | Mountain bearberry | | S | | | | H | | | | | | | | | | | | | | | | | H17, H14-15, M19 |
| Arenaria norvegica ssp anglica | English sandwort | E | | | | 8 | | | | | | | | | | | | | | | | | z | |
| Arenaria norvegica ssp norvegica | Arctic sandwort | | S | | | 8 | H | | | | | | | | | | | | | | | | | CG13 |
| Armeria maritima ssp elongata | Thrift | E | | | | R | H | | | | | | | | | | | | | | | | | MG5 |
| Artemisia campestris | Field wormwood | E | | W | | 8 | | | | | | | | 7 | | | | | | | | | | CG7 |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Artemisia norvegica | Norwegian mugwort | | S | | | R | H | | | | | | | | | | | | | | | | U10 |
| Arum italicum ssp neglectum | Italian lords-and-ladies | E | | W | | | H | | | | | | | | | | | | | | | | W |
| Asparagus officinalis ssp prostratus | Sea asparagus | E | | W | | R | H | | | | | | | | | | | | | | | | MC8 |
| Asplenium obovatum | Lanceolate spleenwort | E | S | W | | | | | | | | | 6 | | | | | | | | | | |
| Asplenium septentrionale | Forked spleenwort | E | S | W | | | | | | | | | | | | | | | | | | z | |
| Asplenium trichomanes ssp pachyrachis[1] | Lobed maidenhair spleenwort | E | | W | | R | H | | | | | | | | | | | | | | | z | OV39? |
| Asplenium viride | Green spleenwort | | | | NI | | H | | | | | | | | | | | | | | | | Inland rock |
| Aster linosyris | Goldilocks aster | E | | W | | R | | | | | | | | | | | | | | 12 | | | CG1, CG9 |
| Astragalus alpinus | Alpine milk-vetch | | S | | | R | H | | | | | | | | | | | | | | | | CG14 |
| Athyrium distentifolium | Alpine lady-fern | | S | | | | H | | | | | | | | | | | | | | | | U18, U11, U16, U19, U21 |
| Athyrium flexile | Newman's lady-fern | | S | | | R | | | | | | | | | | | | | | | 13 | | |
| Atriplex laciniata | Frosted orache | | | | NI | | H | | | | | | | | | | | | | | | | Coastal vegetated shingle |
| Atriplex littoralis | Grass-leaved orache | | | | NI | | H | | | | | | | | | | | | | | | | Coastal vegetated shingle |
| Atriplex longipes | Long-stalked orache | E | S | W | | | H | | | | | | | | | | | | | | | | SM18 |
| Atriplex pedunculata | Pedunculate sea-purslane | E | | | | 8 | | | | | | | | | | | | | | | 14 | | SM |
| Atriplex portulacoides | Sea-purslane | | | | NI | | H | | | | | | | | | | | | | | | | Coastal saltmarsh |
| Atriplex praecox | Early orache | E | S | | | | | | | | | | | | | | | | | | | z | |
| Bartsia alpina | Alpine bartsia | E | S | | | R | H | | | | | | | | | | | | | | | | M10 |
| Betula nana | Dwarf birch | E | S | | | | H | | | | | | | | | | | | | | x | | M19 |
| Blysmus rufus | Saltmarsh flat-sedge | | | | NI | | H | | | | | | | | | | | | | | | | Coastal saltmarsh |
| Botrychium lunaria | Moonwort | | | | NI | | H | | | | | | | | | | | | | | | | Coastal sand dune |
| Brassica oleracea var oleracea | Wild cabbage | E | S | W | | | H | | | | | | | | | | | | | | | | MC4-5, MC8, MC11, OV41 |
| Bromopsis benekenii | Lesser hairy-brome | E | S | W | | | | 1 | | | | | | | | | | | | | | | W9 |
| Bunium bulbocastanum | Great pignut | E | | | | R | | | | | 4 | x | | | | | | | | | | | CG2-6, MG1(?) |
| Bupleurum baldense | Small hare's ear | E | | | | 8 | H | | | | | | | | | | | | | | | | CG1 |
| Bupleurum falcatum | Sickle-leaved hare's ear | E | | | | 8 | | | | | | | | | | 9 | | | | | | | |
| Bupleurum tenuissimum | Slender hare's ear | E | | W | | | | | | | | | | | | | | | | | 14 | | SM27 |
| Butomus umbellatus | Flowering rush | | | | NI | | H | | | | | | | | | | | | | | | | Reeds and swamp, Fen |
| Buxus sempervirens | Box | E | | | | R | H | | | | | | | | | | | | | | | | W12-13 |
| Calamagrostis purpurea ssp phragmitoides | Scandinavian small reed | E | S | | | R | | | | | | | | | | | | | | | | z | W1, M27 |
| Calamagrostis scotica | Scottish small reed | | S | | | R | H | | | | | | | | | | | | | | | | M23 |
| Calamagrostis stricta | Narrow small reed | E | S | | NI | R | H | | | | | | | | | | | | | | | | S1, S10, M23 |
| Callitriche truncata | Short-leaved water-starwort | E | | | | | H | | | | | | | | | | | | | | | | A |
| Calystegia soldanella | Sea bindweed | | | | NI | | H | | | | | | | | | | | | | | | | Maritime cliff |
| Campanula patula | Spreading bellflower | E | | W | | | | 1 | | | | | | | | | | | | | | | W |
| Cardamine amara | Large bittercress | | | | NI | | H | | | | | | | | | | | | | | | | Woodland |
| Cardamine bulbifera | Coralroot | E | | | | | H | | | | | | | | | | | | | | | | W |
| Cardamine impatiens | Narrow-leaved bittercress | E | | W | | | H | | | | | | | | | | | | | | | | W8 |
| Carduus tenuiflorus | Slender thistle | | | | NI | | H | | | | | | | | | | | | | | | | Martime cliff |
| Carex appropinquata | Fibrous tussock-sedge | E | S | | | | H | | | | | | | | | | | | | | | | W3, W5, M9, S24, S27 |
| Carex atrata | Black alpine sedge | E | S | W | | | x | | | | | | | | | | | | | | 13 | | CG14, U17, W20 |
| Carex atrofusca | Scorched sedge | | S | | | R | H | | | | | | | | | | | | | | | | M11 |
| Carex bigelowii | Stiff sedge | | | | NI | | H | | | | | | | | | | | | | | | | Montane heath |
| Carex buxbaumii | Club sedge | | S | | | R | | | | | | | | | | | | | | | | z | |
| Carex capillaris | Hair sedge | E | S | W | | | H | | | | | | | | | | | | | | | | M10, CG9-10, CG14 |

[1] Use Habitat guidance for Welsh populations and Individual guidance for English populations.

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carex chordorrhiza | String sedge | | S | | | R | H | | | | | | | | | | | | | | | | S27, M4 |
| Carex depauperata | Starved sedge | E | | | | 8 | | 1 | x | | | | | | | | | | | | | | W |
| Carex digitata | Fingered sedge | E | | W | | | | 1 | | | | | | | | | | | | | | | W |
| Carex divisa | Divided sedge | E | | W | | | H | | | | | | | | | | | | | | | | MG11, MG13 |
| Carex elongata | Elongated sedge | E | S | W | NI | | H | | | | | | | | | | | | | | | | W2, W5, W7 |
| Carex ericetorum | Rare spring-sedge | E | | | | | H | | | | | | | | | | | | | | | | CG2, CG5, CG7, CG9 |
| Carex filiformis | Downy-fruited sedge | E | | | | R | H | | | | | | | | | | | | | | | | |
| Carex flava | Large yellow sedge | E | | | | R | | | | | | | | | | | | | | | | z | |
| Carex humilis | Dwarf sedge | E | | | | | H | | | | | | | | | | | | | | | | CG1-3 |
| Carex lachenalii | Hare's-foot sedge | | S | | | R | H | | | | | | | | | | | | | | | | U14 |
| Carex magellanica | Tall bog sedge | E | S | W | NI | | H | | | | | | | | | | | | | | | | M2, Reeds and swamp? |
| Carex maritima | Curved sedge | E | S | | | | | | | | | | 6 | | | | | | | | | | |
| Carex microglochin | Bristle sedge | | S | | | R | H | | | | | | | | | | | | | | | | M12 |
| Carex montana | Soft-leaved sedge | E | | W | | | H | | | | | | | | | | | | | | | | H4, CG2, CG10, U |
| Carex muricata ssp muricata | Prickly sedge | E | | W | | R | | | | 3 | | | | | | | | | | | x | | CG (?) |
| Carex norvegica | Close-headed alpine sedge | | S | | | R | H | | | | | | | | | | | | | | | | U15 |
| Carex ornithopoda | Bird's foot sedge | E | | | | R | H | | | | | | | | | | | | | | | | CG2, CG9 |
| Carex pauciflora | Few-flowered sedge | | | | NI | | H | | | | | | | | | | | | | | | | Blanket bog |
| Carex punctata | Dotted sedge | E | S | W | | | | | | | | | | | | | | | | | | z | |
| Carex rariflora | Mountain bog sedge | | S | | | R | H | | | | | | | | | | | | | | | | M7 |
| Carex recta | Estuarine sedge | | S | | | R | | | | | | | | | | | | | | | | z | |
| Carex rupestris | Rock sedge | | S | | | | H | | | | | | | | | | | | | | | | CG10, CG13-14 |
| Carex saxatilis | Russet sedge | | S | | | | H | | | | | | | | | | | | | | | | M12 |
| Carex strigosa | Thin-spiked wood-sedge | | | | NI | | H | | | | | | | | | | | | | | | | Wet woodlands |
| Carex vaginata | Sheathed sedge | E | S | | | | H | | | | | | | | | | | | | | | | M12 |
| Carex vulpina | True fox sedge | E | | | | R | | | | | | | | | | | | | | | | z | |
| Carlina vulgaris | Carline thistle | | | | NI | | H | | | | | | | | | | | | | | | | Coastal sand dune |
| Centaurea calcitrapa | Red star thistle | E | | | | R | | | | | | | | | | 9 | | | | | | | OV |
| Centaurea cyanus | Cornflower | E | S | W | | R | | | | | | | | | 8 | | | | | | | | OV4 |
| Centaurium littorale | Seaside centaury | E | S | W | | | H | | | | | | | | | | | | | | | | SM27, SD |
| Centaurium scilloides | Perennial centaury | | | W | | R | H | | | | | | | | | | | | | | | | MC5, MC8, H7 |
| Centaurium tenuiflorum | Slender centaury | E | | | | 8 | | | | | | | | | | | | | | | | z | |
| Cephalanthera longifolia | Narrow-leaved helleborine | E | S | W | | | H | | | | | | | | | | | | | | | | W9, W11-12 |
| Cephalanthera rubra | Red helleborine | E | | | | 8 | H | | | | | | | | | | | | | | | | W12 |
| Cerastium alpinum | Alpine mouse-ear | E | S | W | | | H | | | | | | | | | | | | | | x | | CG11-12, CG14, U13-14 |
| Cerastium arcticum | Arctic mouse-ear | | S | W | | | H | | | | | | | | | | | | | | | | CG14 |
| Cerastium brachypetalum | Grey mouse-ear | E | | | | R | H | | | | | | | | | | | | | | | | CG2-4 |
| Cerastium cerastoides | Starwort mouse-ear | | S | | | | H | | | | | | | | | | | | | | | | U11 |
| Cerastium fontanum ssp scoticum | Scottish mouse-ear | | S | | | R | H | | | | | | | | | | | | | | | | U10? MC10? |
| Cerastium nigrescens | Shetland mouse-ear | | S | | | R | H | | | | | | | | | | | | | | | | U10? MC10? CG10? |
| Cerastium pumilum | Dwarf mouse-ear | E | | W | | | | | | | | 5 | | | | | | | | | | | CG1 |
| Ceratophyllum demersum | Rigid hornwort | | | | NI | | H | | | | | | | | | | | | | | | | Brackish lake, Mesotrophic lake |
| Chamaemelum nobile | Chamomile | E | | W | | | | | | | | | | | | | | 11 | | | | | |
| Chenopodium chenopodioides | Saltmarsh goosefoot | E | | | | R | | | | | | | | | | | | | | | 14 | | |
| Chenopodium vulvaria | Stinking goosefoot | E | | | | 8 | | | | | | | | | | 9 | | | | | | | |
| Cicendia filiformis | Yellow centaury | E | | W | | | | | | | | | | | | | | 11 | | | | | |
| Cicerbita alpina | Alpine sowthistle | | S | | | 8 | H | | | | | | | | | | | | | | | | U16 |
| Cicuta virosa | Cowbane | E | S | W | NI | | H | | | | | | | | | | | | | | | | S4, S7, S12, W5, M9, Fens |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Circaea alpina | Alpine enchanter's-nightshade | E | S | W | NI | | x | | | | | | | | | | | | | 13 | | | W11,W17, Wet woods |
| Cirsium heterophyllum | Melancholy thistle | | | | NI | | H | | | | | | | | | | | | | | | | Lowland meadow and pasture |
| Cirsium tuberosum | Tuberous thistle | E | | W | | R | | | | | 4 | | | | | | | | | | | | MG1, MG5, CG |
| Clinopodium calamintha | Lesser calamint | E | | W | | | | | | | 4 | | | | | x | | | | | | | |
| Clinopodium menthifolium | Wood calamint | E | | | | 8 | | | 2 | | | | | | | | | | | | | | |
| Cochlearia micacea | Mountain scurvy-grass | | S | | | R | | | | | | | | | | | | | | | | z | |
| Coincya monensis ssp monensis | Isle of Man cabbage | E | S | W | | | H | | | | | | | | | | | | | | | | SD6 |
| Coincya wrightii | Lundy cabbage | E | | | | 8 | | | | | | | | | | | | | | | | z | |
| Corallorhiza trifida | Coralroot orchid | E | S | | | | | | | | | | | | | | | | | | | z | W3, W18, SD14? |
| Corrigiola litoralis | Strapwort | E | | | | 8 | | | | | | | | | | | | | | | | z | |
| Corynephorus canescens | Grey hair-grass | E | | | | R | H | | | | | | | | | | | | | | | | SD6, SD10-11 |
| Cotoneaster integerrimus | Cotoneaster | | | W | | 8 | | | | | | | | | | | | | | 12 | | | |
| Crassula aquatica | Pigmyweed | | S | | | 8 | H | | | | | | | | | | | | | | | | S19? |
| Crassula tillaea | Mossy stonecrop | E | | W | | | | | | | | | 6 | | | | | x | | | | | U1 |
| Crepis foetida | Stinking hawk's-beard | E | | | | 8 | H | | | | | | | | | | | | | | | | SD (shingle) |
| Crepis mollis | Northern hawk's-beard | E | S | | | | H | | | | | | | | | | | | | | | | MG, W9 |
| Crepis praemorsa | Leafless hawk's-beard | E | | | | R | H | | | | | | | | | | | | | | | | |
| Crithmum maritimum | Rock samphire | | | | NI | | H | | | | | | | | | | | | | | | | Coastal mosaic |
| Cryptogramma crispa | Parsley fern | | | | NI | | H | | | | | | | | | | | | | | | | Upland mosaic |
| Cuscuta epithymum | Dodder | | | | NI | | H | | | | | | | | | | | | | | | | Maritime cliff, Sand dune |
| Cuscuta europaea | Greater dodder | E | | | | | | | | | | | | | | | | | | | | z | |
| Cynodon dactylon | Bermuda grass | E | | W | | R | H | | | | | | | | | | | | | | | | SD |
| Cynoglossum germanicum | Green hound's-tongue | E | | | | 8 | | 1 | | | | | | | | | | | | | | | |
| Cynoglossum officinale | Hound's-tongue | | | | NI | | H | | | | | | | | | | | | | | | | Sand dune |
| Cyperus fuscus | Brown galingale | E | | | | 8 | | | | | | | | | | | 10 | x | | | | | |
| Cyperus longus | Galingale | E | | W | | | | | | | | | | | | | | | | | | z | |
| **Cypripedium calceolus** | **Lady's slipper orchid** | **E** | | | | **8** | | | | **3** | | | | | | | | | | | | | **W, CG9** |
| Cystopteris dickieana | Dickie's bladder-fern | | S | | | 8 | H | | | | | | | | | | | | | | | | MC2 |
| Cystopteris montana | Mountain bladder-fern | | S | | | R | H | | | | | | | | | | | | | | | | U15 |
| Cytisus scoparius ssp maritimus | Prostrate broom | E | | W | | R | H | | | | | | | | | | | | | | | | H (coastal), H8 |
| Dactylorhiza incarnata ssp cruenta | Early marsh orchid | | S | | | R | H | | | | | | | | | | | | | | | | M14? |
| Dactylorhiza incarnata ssp ochroleuca | Early marsh orchid | E | | | | R | H | | | | | | | | | | | | | | | | M |
| Dactylorhiza lapponica | Lapland marsh orchid | | S | | | 8 | H | | | | | | | | | | | | | | | | M10? |
| Dactylorhiza traunsteineri | Narrow-leaved marsh orchid | E | S | W | NI | | H | | | | | | | | | | | | | | | | M9, M13, Blanket bog |
| Damasonium alisma | Starfruit | E | | | | 8 | | | | | | | | | | | 10 | | | | | | |
| Daphne mezereum | Mezereon | E | | W | | | H | | | | | | | | | | | | | | | | W8 |
| Deschampsia setacea | Bog hair-grass | E | S | W | | | | | | | | | | | | | | 11 | | | | | |
| Dianthus armeria | Deptford pink | E | | W | | 8 | | | | | | 5 | | | | x | | | | | | | |
| Dianthus deltoides | Maiden pink | E | S | W | | | x | | | | | 5 | | | | | | | | | | | U1, SD8 |
| Dianthus gratianopolitanus | Cheddar pink | E | | | | 8 | | | | | | | | | | | | | | 12 | | | |
| Diapensia lapponica | Diapensia | | S | | | 8 | H | | | | | | | | | | | | | | | | U10 |
| Diphasiastrum alpinum | Alpine clubmoss | | | | NI | | H | | | | | | | | | | | | | | | | Montane heath |
| Diphasiastrum complanatum | Yellow cypress clubmoss | | S | | | R | H | | | | | | | | | | | | | | | | H17 |
| Draba aizoides | Yellow whitlow grass | | | W | | R | H | | | | | | | | | | | | | x | | | OV41 |
| Draba muralis | Wall whitlow grass | E | S | | | | | | | | | | | | | x | | | | 12 | | | |
| Draba norvegica | Rock whitlow grass | | S | | | | H | | | | | | | | | | | | | | | | CG12 |
| Drosera intermedia | Oblong-leaved sundew | | | | NI | | H | | | | | | | | | | | | | | | | Raised bog |
| Dryas octopetala | Mountain avens | E | S | W | NI | | H | | | | | | | | | | | | | | | | CG9, CG13-14, U17, Upland mosaic, Inland Rock |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dryopteris cristata | Crested buckler-fern | E | | | | R | H | | | | | | | | | | | | | | | | W2, W4-5 |
| Dryopteris submontana | Rigid buckler-fern | E | | W | | | | | | | | | | | | | | | | 13 | | | |
| Echium plantagineum | Purple viper's-bugloss | E | | | | R | | | | | | | | | 8 | | | | | | | | |
| Elatine hexandra | Six-stamened waterwort | E | S | W | | | H | | | | | | | | | | | | | | | | A13, A22, S13 |
| Elatine hydropiper | Eight-stamened waterwort | E | S | W | NI | | H | | | | | | | | | | | | | | | | A13, S13, Eutrophic lake |
| Eleocharis acicularis | Needle spike-rush | | | | NI | | H | | | | | | | | | | | | | | | | Fens |
| Eleocharis austriaca | Northern spike-rush | E | S | | | R | H | | | | | | | | | | | | | | | | A, S |
| Eleocharis parvula | Dwarf spike-rush | E | S | W | | 8 | H | | | | | | | | | | | | | | | | SM3 |
| Epipactis atrorubens | Dark-red helleborine | E | S | W | | | x | | | 3 | | | | | | | | | | x | | | CG8, SD8, CG13 |
| Epipactis leptochila | Narrow-lipped helloborine | E | S | W | | | H | | | | | | | | | | | | | | | | SD, W12 |
| Epipactis palustris | Marsh helleborine | | | | NI | | H | | | | | | | | | | | | | | | | SD13 |
| Epipactis phyllanthes | Green-flowered helleborine | E | | W | | | H | | | | | | | | | | | | | | | | W |
| Epipactis youngiana | Young's helleborine | E | S | | | 8 | H | | | | | | | | | | | | | | | | W |
| Epipogium aphyllum | Ghost orchid | E | | | | 8 | H | | | | | | | | | | | | | | | | W12 |
| Equisetum hyemale | Rough horsetail | | | | NI | | H | | | | | | | | | | | | | | | | Woodland |
| Equisetum pratense | Shade horsetail | E | S | | NI | | H | | | | | | | | | | | | | | | | W, MG3, U15, Woodland |
| Equisetum variegatum | Variegated horsetail | E | S | W | NI | | H | | | | | | | | | | | | | | | | SD13-17, CG14, M10, M37 |
| Erica ciliaris | Dorset heath | E | | | | R | H | | | | | | | | | | | | | | | | M16, M21, H3-4 |
| Erica vagans | Cornish heath | E | | | | R | H | | | | | | | | | | | | | | | | M25, H4, H6-7, U3 |
| Erigeron borealis | Alpine fleabane | | S | | | 8 | H | | | | | | | | | | | | | | | | CG12? |
| Eriocaulon aquaticum | Pipewort | | S | | | R | H | | | | | | | | | | | | | | | | A22 |
| Eriophorum gracile | Slender cottongrass | E | | W | | 8 | H | | | | | | | | | | | | | | | | M |
| Erodium moschatum | Musk stork's-bill | E | | W | | | | | | | | | 6 | | | x | | | | | | | OV14 |
| Eryngium campestre | Field eryngo | E | | | | 8 | H | | | | | | | | | | | | | | | | CG, MG |
| Euphorbia hyberna | Irish spurge | E | | | | R | H | | | | | | | | | | | | | | | | W |
| Euphorbia platyphyllos | Broad-leaved spurge | E | | | | | | | | | | | | | 8 | | | | | | | | |
| Euphorbia portlandica | Portland spurge | E | S | W | | | H | | | | | | | | | | | | | | | | H7, H11, CG1, SD6, MC |
| Euphorbia serrulata | Upright spurge | E | | W | | R | | 1 | | | | | | | | | | | | | | | |
| Euphrasia cambrica | Welsh eyebright | | | W | | R | H | | | | | | | | | | | | | | | | U (flushed grassland) |
| Euphrasia campbelliae | Eyebright | | S | | | R | H | | | | | | | | | | | | | | | | H7 |
| Euphrasia foulaensis | Eyebright | | S | | | | H | | | | | | | | | | | | | | | | MC10 |
| Euphrasia frigida | Eyebright | E | S | | | | H | | | | | | | | | | | | | | | | CG10, CG12, CG14, U13, U14 |
| Euphrasia heslop-harrisonii | Eyebright | | S | | | R | H | | | | | | | | | | | | | | | | SM16 |
| Euphrasia marshallii | Eyebright | | S | | | R | H | | | | | | | | | | | | | | | | MC9-10 |
| Euphrasia ostenfeldii | Eyebright | E | S | W | | | H | | | | | | | | | | | | | | | | CG10, CG13 |
| Euphrasia pseudokerneri | Eyebright | E | | | | | H | | | | | | | | | | | | | | | | CG |
| Euphrasia rivularis | Eyebright | E | | W | | R | H | | | | | | | | | | | | | | | | U (flushed grassland) |
| Euphrasia rostkoviana ssp montana | Eyebright | E | S | W | | | H | | | | | | | | | | | | | | | | MG3 |
| Euphrasia rostkoviana ssp rostkoviana | Eyebright | E | S | W | | | H | | | | | | | | | | | | | | | | MG3 |
| Euphrasia rotundifolia | Eyebright | | S | | | R | H | | | | | | | | | | | | | | | | MC9 |
| Euphrasia salisburgensis | Eyebright | | | | NI | | H | | | | | | | | | | | | | | | | Upland calcareous grassland |
| Euphrasia vigursii | Eyebright | E | | | | R | H | | | | | | | | | | | | | | | | H4, CG2, CG10, U |
| Fallopia dumetorum | Copse bind-weed | E | | | | | | x | 2 | | | | | | | | | | | | | | |
| Festuca altissima | Wood fescue | | | | NI | | H | | | | | | | | | | | | | | | | Woods, Inland rock |
| Festuca arenaria | Rush-leaved fescue | E | S | W | | | H | | | | | | | | | | | | | | | | SD6 |
| Festuca longifolia | Blue fescue | E | | | | R | H | | | | | | | | | | | | | | | | H, U |
| Filago gallica | Narrow-leaved cudweed | E | | | | R | | | | | | x | | | 8 | | | | | | | | |
| Filago lutescens | Red-tipped cudweed | E | | | | 8 | | | | | | 5 | | x | x | x | | | | | | | |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Filago minima | Small cudweed | | | | NI | | H | | | | | | | | | | | | | | | | Sand dune |
| Filago pyramidata | Broad-leaved cudweed | E | | | | 8 | | | | | | 5 | | x | x | | | | | | | | |
| Frangula alnus | Alder buckthorn | | | | NI | | H | | | | | | | | | | | | | | | | Woods |
| Frankenia laevis | Sea-heath | E | | W | | | H | | | | | | | | | | | | | | | | SM14, SM21-22 |
| Fritillaria meleagris | Fritillary | E | | | | | H | | | | | | | | | | | | | | | | MG4 |
| Fumaria densiflora | Dense-flowered fumitory | E | S | | | | | | | | | | | | 8 | | | | | | | | |
| Fumaria occidentalis | Western ramping-fumitory | E | | | | R | | | 2 | | | | | | x | x | | | | | | | OV6 |
| Fumaria parviflora | Fine-leaved fumitory | E | | | | | | | | | | | | | 8 | | | | | | | | |
| Fumaria purpurea | Purple ramping-fumitory | E | S | W | | | | | | | | | | | 8 | | | | | | | | |
| Fumaria reuteri | Martin's ramping-fumitory | E | | | | 8 | | | | | | | | | 8 | | | | | | | | |
| Fumaria vaillantii | Few-flowered fumitory | E | | | | | | | | | | | | | 8 | | | | | | | | |
| Gagea bohemica | Radnor lily | | | W | | 8 | | | | | | | | 7 | | | | | | | | | |
| Galeopsis angustifolia | Red hemp-nettle | E | | W | | | | | | | | | | | 8 | | | | | | | | Scree |
| Galium constrictum | Slender bedstraw | E | | | | R | | | | | | | | | | | 10 | | | | | | M29 |
| Galium parisiense | Wall bedstraw | E | | | | | | | | | | | | | | 9 | | | | | | | CG7 |
| Galium pumilum | Slender bedstraw | E | | | | | H | | | | | | | | | | | | | | | | CG2-3, CG5 |
| Galium tricornutum | Corn cleavers | E | | | | R | | | | | | | | | 8 | | | | | | | | |
| Gastridium ventricosum | Nit-grass | E | | W | | | | | | | | 5 | | | x | | | | | | | | |
| Genista pilosa | Hairy greenweed | E | | W | | R | H | | | | | | | | | | | | | | | | H2, H7, MC5 |
| Gentiana nivalis | Alpine gentian | | S | | | 8 | H | | | | | | | | | | | | | | | | CG12, CG14 |
| Gentiana pneumonanthe | Marsh gentian | E | | W | | | H | | | | | | | | | | | | | | | | M16, M21, H3-4 |
| Gentiana verna | Spring gentian | E | | | | 8 | H | | | | | | | | | | | | | | | | CG9 |
| **Gentianella anglica** | **Early gentian** | **E** | | | | **8** | **H** | | | | | | | | | | | | | | | | **CG2-3** |
| Gentianella ciliata | Fringed gentian | E | | | | 8 | H | | | | | | | | | | | | | | | | CG2? |
| Gentianella germanica | Chiltern gentian | E | | | | | | | | 3 | | | | | | | | | | | | | |
| Gentianella uliginosa | Dune gentian | E | S | W | | 8 | H | | | | | | | | | | | | | | | | SD16 |
| Geranium pratense | Meadow crane's-bill | | | | NI | | H | | | | | | | | | | | | | | | | Maritime cliff |
| Geranium purpureum | Little robin | E | | | | | | | | | | | | | | | | | 12 | | | | Shingle/maritime cliff |
| Geranium sylvaticum | Wood crane's-bill | | | | NI | | H | | | | | | | | | | | | | | | | Woods |
| Gladiolus illyricus | Wild gladiolus | E | | | | 8 | | | | | | | | | | | | | | | | z | |
| Gnaphalium luteoalbum | Jersey cudweed | E | | | | 8 | | | | | | | | | | | | | | | | z | |
| Gnaphalium norvegicum | Highland cudweed | | S | | | | H | | | | | | | | | | | | | | | | U7 |
| Goodyera repens | Creeping lady's tresses | E | S | | | | H | | | | | | | | | | | | | | | | W17 (?), W18 |
| Gymnocarpium dryopteris | Oak fern | | | | NI | | H | | | | | | | | | | | | | | | | Upland mosaic |
| Gymnocarpium robertianum | Limestone fern | E | S | W | | | x | | | | | | | | | | | | | | 13 | | OV38 |
| Hammarbya paludosa | Bog orchid | E | S | W | NI | | H | | | | | | | | | | | | | | | | M1, M21, Upland mosaic |
| Helianthemum apenninum | White rock-rose | E | | | | R | H | | | | | | | | | | | | | | | | CG1a, CG10 |
| Helianthemum oelandicum ssp incanum | Hoary rock-rose | E | | W | | | H | | | | | | | | | | | | | | | | CG9 |
| Helianthemum oelandicum ssp levigatum | Hoary rock-rose | E | | | | R | H | | | | | | | | | | | | | | | | CG9 |
| Helleborus foetidus | Stinking hellebore | E | | W | | | H | | | | | | | | | | | | | | | | W |
| Herminium monorchis | Musk orchid | E | | | | | H | | | | | | | | | | | | | | | | CG2, CG4-5 |
| Herniaria ciliolata | Fringed rupturewort | E | | | | R | H | | | | | | | | | | | | | | | | H7, MC5, OV34 |
| Herniaria glabra | Smooth rupturewort | E | | | | R | | | | | | | | 7 | | | | | | | | | |
| Hieracium Sect. Alpestria | Alpine hawkweeds | | S | | | R/8 | | | | | | | | | | | | | | | 13 | | |
| Hierochloe odorata | Holy-grass | | S | | NI | R | H | | | | | | | | | | | | | | | | SM16, S4, S28, Lowland meadow and pasture |
| Himantoglossum hircinum | Lizard orchid | E | | | | 8 | | | | | 4 | | | | | | | | | | | | |
| Hippophae rhamnoides | Sea-buckthorn | E | S | | | | H | | | | | | | | | | | | | | | | SD18 |
| Homogyne alpina | Alpine coltsfoot | | S | | | 8 | H | | | | | | | | | | | | | | | | U15 |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hordelymus europaeus | Wood barley | E | | W | | | | 1 | x | | | | | | | | | | | | | | |
| Hordeum marinum | Sea barley | E | | W | | | | | | | | | | | | | | | | 14 | | | SM16, SM23, SM27, SM28(1) |
| Hornungia petraea | Hutchinsia | E | | W | | | H | | | | | | | | | | | | | | | | CG7, OV39 |
| Hydrilla verticillata | Esthwaite waterweed | E | S | | | R | H | | | | | | | | | | | | | | | | A13? |
| Hydrocharis morsus-ranae | Frogbit | | | | NI | | H | | | | | | | | | | | | | | | | Reed beds and swamp |
| Hymenophyllum tunbrigense | Tunbridge filmy fern | | | | NI | | H | | | | | | | | | | | | | | | | Inland rock |
| Hyoscyamus niger | Henbane | | | | NI | | H | | | | | | | | | | | | | | | | Coastal grassland mosaic |
| Hypericum elodes | Marsh St. John's-wort | | | | NI | | H | | | | | | | | | | | | | | | | Coastal mosaic |
| Hypericum linariifolium | Toadfax-leaved St John's-wort | E | | W | | R | | | | | | | | | | | | | | | | z | |
| Hypericum undulatum | Wavy St John's-wort | E | | W | | | H | | | | | | | | | | | | | | | | M24 (culm grasslands) |
| Hypochaeris glabra | Smooth cat's ear | E | S | W | NI | | | | | | | 5 | x | x | | | | | | | | | SD19, Coastal sand dune |
| Hypochaeris maculata | Spotted cat's ear | E | | W | | R | | | | | | | | | | | | | | | | z | CG1-3, CG9 |
| Iberis amara | Wild candytuft | E | | | | | | | | | | 5 | | | x | | | | | | | | |
| Illecebrum verticillatum | Coral necklace | E | | | | | | | | | | | | | | | | 11 | | | | | |
| Impatiens noli-tangere | Touch-me-not balsam | E | | W | | | H | | | | | | | | | | | | | | | | W |
| Inula crithmoides | Golden samphire | E | S | W | | | H | | | | | | | | | | | | | | | | SM14, SM22, SM26, MC1 |
| Isoetes echinospora | Spring quillwort | E | S | W | | | H | | | | | | | | | | | | | | | | A13, A22-23 |
| Isoetes histrix | Land quillwort | E | | | | R | | | | | | | | | | | | 11 | | | | | H7, OV34 |
| Juncus acutus | Sharp rush | E | | W | | | H | | | | | | | | | | | | | | | | SD14-16 |
| Juncus alpinoarticulatus | Alpine rush | E | S | | | | H | | | | | | | | | | | | | | | | M11 |
| Juncus balticus | Baltic rush | E | S | | | | H | | | | | | | | | | | | | | | | SD |
| Juncus biglumis | Two-flowered rush | | S | | | | H | | | | | | | | | | | | | | | | M34? |
| Juncus capitatus | Dwarf rush | E | | W | | R | | | | | | | | | | | | 11 | | | | | H6 (!), OV34 |
| Juncus castaneus | Chestnut rush | | S | | | | H | | | | | | | | | | | | | | | | M12 |
| Juncus filiformis | Thread rush | E | S | W | | | H | | | | | | | | | | | | | | | | A10, S (reservoir draw-down} |
| Juncus pygmaeus | Pygmy rush | E | | | | R | | | | | | | | | | | | 11 | | | | | |
| Juncus subnodulosus | Blunt-flowered rush | | | | NI | | H | | | | | | | | | | | | | | | | Coastal mosaic, Fens |
| Juniperus communis | Juniper | | | *W* | NI | | | | | | | | | | | | | | | | | z | Inland rock, Upland mosaic |
| Kobresia simpliciuscula | False sedge | E | S | | | R | H | | | | | | | | | | | | | | | | M10-12, CG9 |
| Koeleria vallesiana | Somerset hair-grass | E | | | | R | H | | | | | | | | | | | | | | | | CG1a, CG10 |
| Koenigia islandica | Iceland purslane | | S | | | R | H | | | | | | | | | | | | | | | | U10, M32, M34 |
| Lactuca saligna | Least lettuce | E | | | | 8 | | | | | | | | | | | | | | | 14 | | |
| Lathraea squamaria | Toothwort | | | | NI | | H | | | | | | | | | | | | | | | | Upland mixed ashwood, Woodland |
| Lathyrus aphaca | Yellow vetchling | E | | | | | | | x | | 4 | | | | | x | | | | | x | | |
| Lathyrus japonicus | Sea pea | E | S | | | | H | | | | | | | | | | | | | | | | SD1 |
| Lathyrus palustris | Marsh pea | E | S | W | NI | | H | | | | | | | | | | | | | | | | S24, M23, Fens, Reed beds and swamp |
| Lavatera cretica | Cretan mallow | E | | W | | R | | | | | | | | | | 9 | | | | | | | |
| Leersia oryzoides | Cut-grass | E | | | | 8 | H | | | | | | | | | | | | | | | | |
| Lemna gibba | Fat duckweed | | | | NI | | H | | | | | | | | | | | | | | | | Fens |
| Lepidium latifolium | Dittander | E | | W | | | | | | | | | | | | | | | | | 14 | | |
| Leucojum aestivum ssp aestivum | Summer snowflake | E | | | | R | H | | | | | | | | | | | | | | | | W5? |
| Limonium bellidifolium | Matted sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | | SM13, SM14, SM21 |
| Limonium binervosum ssp anglicum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | | SM14, SM17, SM21 |
| Limonium binervosum ssp binervosum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | | MC, SM |
| Limonium binervosum ssp cantianum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | | MC, SM |
| Limonium binervosum ssp mutatum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | | MC1 |
| Limonium binervosum ssp saxonicum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | | SM14 (?), SM17 |
| Limonium britannicum ssp britannicum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | | MC1 |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Limonium britannicum ssp celticum | Rock sea-lavender | E | | W | | R | H | | | | | | | | | | | | | | | MC1? |
| Limonium britannicum ssp coombense | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | MC1 |
| Limonium britannicum ssp transcanalis | Rock sea-lavender | E | | W | | R | H | | | | | | | | | | | | | | | MC1 |
| Limonium dodartiforme | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | MC1 (+shingle) |
| Limonium humile | Lax-flowered rock sea-lavender | E | S | W | NI | | H | | | | | | | | | | | | | | | SM, Coastal saltmarsh |
| Limonium loganicum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | MC |
| Limonium paradoxum | Rock sea-lavender | | | W | | R | H | | | | | | | | | | | | | | | MC1 |
| Limonium parvum | Rock sea-lavender | | | W | | R | H | | | | | | | | | | | | | | | MC1 |
| Limonium procerum ssp cambrense | Rock sea-lavender | | | W | | R | H | | | | | | | | | | | | | | | MC1 |
| Limonium procerum ssp devoniense | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | MC |
| Limonium procerum ssp procerum | Rock sea-lavender | E | | W | | R | H | | | | | | | | | | | | | | | SM13, SM16-17, MC1 |
| Limonium recurvum ssp humile | Rock sea-lavender | E | S | | | R | H | | | | | | | | | | | | | | | MC1, SM13, SM15 |
| Limonium recurvum ssp portlandicum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | MC1 |
| Limonium recurvum ssp recurvum | Rock sea-lavender | E | | | | R | H | | | | | | | | | | | | | | | MC1 |
| Limonium transwallianum | Rock sea-lavender | | | W | | R | H | | | | | | | | | | | | | | | MC1 |
| Limosella aquatica | Mudwort | E | S | W | | | x | | | | | | | | | 10 | x | | | | | A, OV31, OV35 |
| Limosella australis | Welsh mudwort | | | W | | 8 | H | | | | | | | | | | | | | | | SM3, SM20 |
| Linnaea borealis | Twinflower | | S | | | | H | | | | | | | | | | | | | | | W18-19 |
| Linum perenne | Pale flax / perennial flax | E | S | | | | H | | | | | | | | | | | | | | | CG2-3, CG8 |
| **Liparis loeselii**[2] | **Fen orchid** | **E** | | **W** | | **8** | **H** | | | | | | | | | | | | | | **z** | **M9, SD14** |
| Lithospermum purpureocaeruleum | Purple gromwell | E | | W | | R | | 1 | x | | | | | | | | | | | | | |
| Lloydia serotina | Snowdon lily | | | W | | 8 | H | | | | | | | | | | | | | | | CG14 |
| Lobelia urens | Heath lobelia | E | | | | R | H | | | | | | | | | | | | | | | M25 |
| Lonicera xylosteum | Fly honeysuckle | E | | | | R | | | 2 | | | | | | | | | | | | | |
| Lotus angustissimus | Slender bird'sfoot trefoil | E | | | | | | | | | | | | | | | | | | | z | U1f, MC5 |
| Lotus subbiflorus | Hairy bird'sfoot trefoil | E | | W | | | | | | | | | | | | | | | | | z | U1f, MC5 |
| Ludwigia palustris | Hampshire purslane | E | | | | R | | | | | | | | | | 10 | | | | | | |
| **Luronium natans** | **Floating water-plantain** | **E** | **S** | **W** | | **8** | | | | | | | | | | | | | | | **z** | **A** |
| Luzula arcuata | Curved wood-rush | | S | | | R | H | | | | | | | | | | | | | | | U9-10,U12 |
| Luzula pallidula | Fen wood-rush | E | | | | R | H | | | | | | | | | | | | | | | M |
| Lychnis alpina | Alpine catchfly | E | S | | | 8 | | | | | | | | | | | | | 13 | | | |
| Lychnis viscaria | Sticky catchfly | E | S | W | | R | H | | | | | | | | | | | | | | | U1 |
| Lycopodiella inundata | Marsh clubmoss | E | S | W | NI | | | | | | | | | | | | 11 | | | | | M16, Wet heath |
| Lycopodium annotinum | Interrupted clubmoss | E | S | | | | H | | | | | | | | | | | | | | | H12 |
| Lycopodium clavatum | Stag's-horn clubmoss | | | | NI | | H | | | | | | | | | | | | | | | Upland mosaic |
| Lysimachia thyrsiflora | Tufted loosestrife | E | S | W | | | H | | | | | | | | | | | | | | | W1, W3, M4, S27 |
| Lythrum hyssopifolium | Grass poly | E | | W | | 8 | | | | | | | | | | | | | | | z | OV36 |
| Maianthemum bifolium | May lily | E | | | | R | H | | | | | | | | | | | | | | | W |
| Marrubium vulgare | White horehound | E | | W | | | | | | | | 5 | | | | | | | | | | |
| Matthiola sinuata | Sea stock | E | | W | | R | H | | | | | | | | | | | | | | | SD (strandline + shingle) |
| Meconopsis cambrica | Welsh poppy | E | | W | NI | | H | | | | | | | | | | | | | | | W, Upland mixed ashwood |
| Medicago minima | Bur medick | E | | | | | | | | | | x | | 7 | | | | | | | x | CG7 |
| Medicago polymorpha | Toothed medick | E | | | | | | | | | | 5 | | | x | x | | | | | | OV14 |
| Medicago sativa ssp falcata | Sickle medick | E | | | | | | | | | | x | | 7 | | | | | | | | CG7 |
| Melampyrum arvense | Field cow-wheat | E | | | | 8 | | | | | | | | | 8 | | | | | | | |

[2] Use Habitat guidance for Welsh and Devon populations and Individual guidance for other English populations.

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Melampyrum cristatum | Crested cow-wheat | E | | | | | | 1 | x | | | | | | | | | | | | | | |
| Melampyrum sylvaticum | Small cow-wheat | E | S | | | | H | | | | | | | | | | | | | | | | W11 |
| Melittis melissophyllum | Bastard balm | E | | W | | | | 1 | x | | | | | | | | | | | | | | |
| Mentha pulegium | Pennyroyal | E | | W | NI | 8 | | | | | | | | | | | | 11 | | | | | Purple moor-grass and rush pasture |
| Mertensia maritima | Oysterplant | E | S | | | | H | | | | | | | | | | | | | | | | SD3 |
| Meum athamanticum | Spignel | E | S | W | | | H | | | | | | | | | | | | | | | | MG |
| Mibora minima | Early sand grass | E | | W | | R | | | | | | | 6 | | | | | | | | | | SD7-8, SD19, MC5 |
| Minuartia hybrida | Fine-leaved sandwort | E | | W | | | | | | | | | | | x | 9 | | | | | | | CG7 |
| Minuartia rubella | Mountain sandwort | | S | | | R | H | | | | | | | | | | | | | | | | CG12 |
| Minuartia sedoides | Cyphel | | S | | | | H | | | | | | | | | | | | | | | | CG11-12, CG14, U10, U13-14 |
| Minuartia stricta | Teesdale sandwort | E | | | | 8 | H | | | | | | | | | | | | | | | | M10 |
| Minuartia verna | Spring sandwort | E | S | W | | | H | | | | | | | | | | | | | | | | M10(?), H7, CG9-10, MC5, OV37 |
| Moneses uniflora | One-flowered wintergreen | | S | | | R | H | | | | | | | | | | | | | | | | W18 |
| Monotropa hypopitys | Yellow bird's-nest | | | | NI | | H | | | | | | | | | | | | | | | | Upland mixed ashwood |
| Muscari neglectum | Grape hyacinth | E | | | | R | | | | | | | | 7 | | | | | | | | | |
| Myosotis alpestris | Alpine forget-me-not | E | S | | | R | H | | | | | | | | | | | | | | | | CG9-10 |
| Myosotis stolonifera | Pale forget-me-not | E | S | | | | H | | | | | | | | | | | | | | | | M32 |
| Myriophyllum verticillatum | Whorled water-milfoil | E | | W | | | H | | | | | | | | | | | | | | | | A4 |
| **Najas flexilis** | **Slender naiad** | **E** | **S** | | | **8** | **H** | | | | | | | | | | | | | | | | **A13** |
| Najas marina | Holly-leaved naiad | E | | | | 8 | H | | | | | | | | | | | | | | | | A |
| Neottia nidus-avis | Bird's-nest orchid | | | | NI | | H | | | | | | | | | | | | | | | | Upland mixed ashwood, Upland oakwood |
| Nuphar pumila | Least water-lily | E | S | | | | H | | | | | | | | | | | | | | | | A7-8 |
| Nymphoides peltata | Fringed water-lily | E | | | | | H | | | | | | | | | | | | | | | | A7-8 |
| Oenanthe silaifolia | Narrow-leaved water-dropwort | E | | | | | H | | | | | | | | | | | | | | | | MG (floodplain, grasslands) |
| Ononis reclinata | Small rest-harrow | E | S | W | | 8 | H | | | | | | | | | | | | x | | | | MC5 |
| Ophioglossum azoricum[3] | Small adder's-tongue | E | S | W | | | H | | | | | | | | | | | | | | | z | H2, H3, H7, MC8, MC10 |
| Ophioglossum lusitanicum | Least adder's-tongue | E | | | | 8 | | | | | | | | | | | | | | | | z | |
| Ophrys fuciflora | Late spider orchid | E | | | | 8 | H | | | | | | | | | | | | | | | | CG2 |
| Ophrys sphegodes | Early spider orchid | E | | | | 8 | H | | | | | | | | | | | | | | | | CG2, MC4 |
| Orchis militaris | Military orchid | E | | | | 8 | H | | | | | | | | | | | | | | | | W21, CG3 |
| Orchis morio | Green-winged orchid | | *S* | *W* | NI | | H | | | | | | | | | | | | | | | | *MG5*, Coastal grassland mosaic |
| Orchis purpurea | Lady orchid | E | | | | | | | | 3 | | | | | | | | | | | | | W12, W21 |
| Orchis simia | Monkey orchid | E | | | | 8 | | | | 3 | | | | | | | | | | | | | |
| Orchis ustulata | Burnt orchid | E | | W | | | H | | | | | | | | | | | | | | | | CG2-3 |
| Ornithogalum pyrenaicum | Spiked star of Bethlehem | E | | W | | | | 1 | | | x | | | | | | | | | | | | |
| Ornithopus pinnatus | Orange bird's foot | E | | | | R | | | | | | | | | | | | | | | | z | MC5 |
| Orobanche alba | Thyme broomrape | E | S | | NI | | H | | | | | | | | | | | | | | | | H10, CG, Upland calcareous grassland |
| Orobanche artemisiae-campestris | Oxtongue broomrape | E | | | | 8 | H | | | | | | | | | | | | | | | | CG (coastal) |
| Orobanche caryophyllacea | Bedstraw broomrape | E | | | | 8 | | | | x | 4 | | | | | | | | | | | | |
| Orobanche hederae | Ivy broomrape | E | S | W | | | | | | 3 | | | | | | | | | | | | | |
| Orobanche purpurea | Purple broomrape | E | | W | | R | | | | | 4 | | | | | | | | | | | | |
| Orobanche rapum-genistae | Greater broomrape | E | S | W | | | | | | 3 | x | | | | | | | | | | | | |
| Orobanche reticulata | Thistle broomrape | E | | | | 8 | | | | | 4 | | | | | | | | | | | | |
| Orthilia secunda | Serrated wintergreen | | | | NI | | H | | | | | | | | | | | | | | | | Upland mosaic |
| Oxytropis campestris | Yellow oxytropis | | S | | | R | H | | | | | | | | | | | | | | | | U15 |

[3] Use Habitat guidance for Scottish populations and Individual guidance for English and Welsh populations.

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oxytropis halleri | Purple oxytropis | | S | | | R | H | | | | | | | | | | | | | | | | MC9-10, CG13-14 |
| Parapholis incurva | Curved hard-grass | E | | W | | | | | | | | | | | | | | | | 14 | | | MC1, MC8 |
| Parapholis strigosa | Hard-grass | | | | NI | | H | | | | | | | | | | | | | | | | Coastal mosaic, Coastal saltmarsh |
| Persicaria mitis | Tasteless water-pepper | E | | W | | | | | | | | | | | | | 10 | | | | | | |
| Petrorhagia nanteuilii | Childing pink | E | | W | | 8 | | | | | | | 6 | | | | | | | | | | |
| Petrorhagia prolifera | Proliferous pink | E | | | | R | | | | | | | | 7 | | | | | | | | | |
| *Petroselinum segetum* | *Corn parsley* | | | *W* | | | | | | | | *5* | | | *x* | | | | | | | | |
| Peucedanum officinale | Sea hog's-fennel | E | | | | R | | | | | | | | | | | | | | 14 | | | |
| Peucedanum palustre | Milk-parsley | E | | | | | H | | | | | | | | | | | | | | | | W2, W5, M22, S24, S27 |
| Phegopteris connectilis | Beech fern | | | | NI | | H | | | | | | | | | | | | | | | | Upland mosaic |
| Phleum alpinum | Alpine cat's-tail | E | S | | | | H | | | | | | | | | | | | | | | | M32-33 |
| Phleum phleoides | Purple-stemmed cat's-tail | E | | | | R | | | | | | | | 7 | | | | | | | | | CG7 |
| Phyllodoce caerulea | Blue heath | | S | | | 8 | H | | | | | | | | | | | | | | | | H10 |
| Physospermum cornubiense | Bladderseed | E | | | | R | | | | | | | | | | | | | | | | z | |
| Phyteuma orbiculare | Round-headed rampion | E | | | | | H | | | | | | | | | | | | | | | | CG2-4 |
| Phyteuma spicatum | Spiked rampion | E | | | | 8 | H | | | | | | | | | | | | | | | | W |
| Pilosella flagellaris ssp bicapitata | Shetland mouse-ear hawkweed | | S | | | R | | | | | | | | | | | | | 12 | | | | |
| Pilosella peleteriana ssp peleteriana | Shaggy mouse-ear hawkweed | E | | | | R | H | | | | | | | | | | | | | | | | CG2 |
| Pilosella peleteriana ssp subpeleteriana | Shaggy mouse-ear hawkweed | | | W | | R | H | | | | | | | x | | | | | | | | | U1 |
| Pilosella peleteriana ssp tenuiscapa | Shaggy mouse-ear hawkweed | E | | | | R | H | | | | | | | | | | | | | | | | CG |
| Pilularia globulifera | Pillwort | E | S | W | | | H | | | | | | | | | | | x | | | | | M29, OV35, A13? |
| Pinus sylvestris | Scots pine | | S | | | | H | | | | | | | | | | | | | | | | W18 |
| *Platanthera bifolia* | *Lesser butterfly orchid* | | *S* | *W* | | | *H* | | | | | | | | | | | | | | | | *W8, MG5* |
| *Platanthera chlorantha* | *Greater butterfly orchid* | | *S* | *W* | | | *H* | | | | | | | | | | | | | | | | *MG5, W8* |
| Poa alpina | Alpine meadow-grass | E | S | W | | | H | | | | | | | | | | | | | | | | CG12 |
| Poa bulbosa | Bulbous meadow-grass | E | | W | | | | | | | | | 6 | | | | | | | | | | MC5 |
| Poa flexuosa | Wavy meadow-grass | | S | | | R | | | | | | | | | | | | | | 13 | | | |
| Poa glauca | Glaucous meadow-grass | E | S | W | | | H | | | | | | | | | | | | | | | | U17 |
| Poa infirma | Early meadow grass | E | | | | | | | | | | | 6 | | | x | | | | | | | MC5 |
| Polemonium caeruleum | Jacob's-ladder | E | | | | R | H | | | | | | | | | | | | | | | | MG2 |
| Polycarpon tetraphyllum | Four-leaved allseed | E | | | | R | | | | | | | 6 | | | | | | | | | | MC5, OV6 |
| Polygala amarella | Dwarf milkwort | E | | | | R | H | | | | | | | | | | | | | | | | CG2, CG7, CG9 |
| Polygonatum odoratum | Angular Solomon's seal | E | | W | | | H | | | | | | | | | | | | | | | | W8 |
| Polygonatum verticillatum | Whorled Solomon's seal | | S | | | 8 | H | | | | | | | | | | | | | | | | W9 |
| Polygonum boreale | Northern knotgrass | | S | | | | H | | | | | | | | | | | | | | | | OV33 |
| Polygonum maritimum | Sea knotgrass | E | | | | 8 | H | | | | | | | | | | | | | | | | SD (sandy driftlines) |
| Polypogon monspeliensis | Annual beard-grass | E | | | | | | | | | | | | | | | | | | 14 | | | |
| Polystichum lonchitis | Holly fern | | | | NI | | H | | | | | | | | | | | | | | | | Inland rock |
| Potamogeton acutifolius | Sharp-leaved pondweed | E | | | | R | H | | | | | | | | | | | | | | | | A |
| Potamogeton coloratus | Fen pondweed | E | S | W | NI | | H | | | | | | | | | | | | | | | | A5, M9, M13, Fens |
| Potamogeton compressus | Grass-wrack pondweed | E | S | W | | | H | | | | | | | | | | | | | | | | A11 |
| Potamogeton epihydrus | American pondweed | | S | | | R | H | | | | | | | | | | | | | | | | A22 |
| Potamogeton filiformis | Slender-leaved pondweed | E | S | | NI | | H | | | | | | | | | | | | | | | | A11, A13-14, Eutrophic lake, Mesotrophic lake |
| Potamogeton nodosus | Loddon pondweed | E | | | | R | H | | | | | | | | | | | | | | | | A |
| Potamogeton pusillus | Lesser pondweed | | | | NI | | H | | | | | | | | | | | | | | | | Brackish Lake |
| Potamogeton rutilus | Shetland pondweed | | S | | | R | H | | | | | | | | | | | | | | | | A13 |
| Potamogeton trichoides | Hairlike pondweed | E | S | W | | | H | | | | | | | | | | | | | | | | A11 |
| Potentilla crantzii | Alpine cinquefoil | E | S | W | | | H | | | | | | | | | | | | | | | | W19, CG9-12, CG14, U17 |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Potentilla fruticosa | Shrubby cinquefoil | E | | | | R | | | | | | | | | | | | | | | z | CG9 |
| Potentilla neumanniana | Spring cinquefoil | E | S | W | | | H | | | | | | | | | | | | | | | CG1, CG7, CG9 |
| Potentilla rupestris[4] | Rock cinquefoil | | S | W | | 8 | | | | | | | | | | | | | 12 | 13 | | U1 |
| Primula elatior | Oxlip | E | | | | | H | | | | | | | | | | | | | | | W8 |
| Primula farinosa | Bird's-eye primrose | E | | | | | H | | | | | | | | | | | | | | | M10, M26, CG8-9 |
| Primula scotica | Scottish primrose | | S | | | | H | | | | | | | | | | | | | | | MC9-10 |
| Prunus padus | Bird cherry | | | | NI | | H | | | | | | | | | | | | | | | Woodland |
| Puccinellia fasciculata | Borrer's saltmarsh-grass | E | | | | | | | | | | | | | | | | | | 14 | | SM23, SM27 |
| Puccinellia rupestris | Stiff saltmarsh-grass | E | | W | | | | | | | | | | | | | | | | 14 | | SM27 |
| Pulicaria vulgaris | Lesser fleabane | E | | | | 8 | | | | | | | | | | | 11 | | | | | |
| Pulmonaria longifolia | Narrow-leaved lungwort | E | | | | | | 1 | | | | | | | | | | | | | | |
| Pulmonaria obscura | Unspotted lungwort | E | | | | R | H | | | | | | | | | | | | | | | W8 |
| Pulsatilla vulgaris | Pasque flower | E | | | | | H | | | | | | | | | | | | | | | CG2-3, CG5 |
| Pyrola media | Intermediate wintergreen | E | S | | NI | | H | | | | | | | | | | | | | | | W1, W18-19 |
| Pyrola minor | Common wintergreen | | *S* | *W* | NI | | H | | | | | | | | | | | | | | | W, Upland oakwood, Upland mosaic |
| Pyrola rotundifolia ssp maritima | Round-leaved wintergreen | E | | W | | | H | | | | | | | | | | | | | | | SD13-14 |
| Pyrola rotundifolia ssp rotundifolia | Round-leaved wintergreen | E | S | | | | H | | | | | | | | | | | | | | | W2-3, W18, M9, SD |
| Pyrus cordata | Plymouth pear | E | | | | 8 | | | 2 | | | | | | | | | | | | | |
| Ranunculus circinatus | Fan-leaved water-crowfoot | | | | NI | | H | | | | | | | | | | | | | | | Mesotrophic lake |
| Ranunculus ophioglossifolius | Adder's tongue spearwort | E | | | | 8 | | | | | | | | | | | 10 | | | | | |
| Ranunculus reptans | Creeping spearwort | E | S | | | R | H | | | | | | | | | | | | | | | A22?, S19 |
| Ranunculus tripartitus | Three-lobed crowfoot | E | | W | | R | | | | | | | | | | | | 11 | | | | |
| Raphanus raphanistrum ssp maritimus | Sea radish | | | | NI | | H | | | | | | | | | | | | | | | Coastal mosaic |
| Rhamnus cathartica | Buckthorn | | | | NI | | H | | | | | | | | | | | | | | | Wet woodlands |
| Rhinanthus angustifolius | Greater yellow-rattle | E | S | | | 8 | H | | | | | | | | | | | | | | | MG5? |
| Rhynchospora fusca | Brown beak-sedge | E | S | W | | | H | | | | | | | | | | | | | | | M1, M16 |
| Ribes alpinum | Mountain currant | E | | | | | H | | | | | | | | | | | | | | | W8 |
| Ribes spicatum | Downy currant | E | S | | | | H | | | | | | | | | | | | | | | W8? |
| Romulea columnae | Sand crocus | E | | | | 8 | | | | | | | 6 | | | | | | | | | SD, MC5 |
| Rorippa islandica | Iceland yellow-cress | E | S | W | | | H | | | | | | | | | | | | | | | OV20, OV32, OV35 |
| Rosa agrestis | Small-leaved sweet briar | E | | W | | | | | | 3 | | | | | | | | | | | | |
| Rumex aquaticus | Scottish dock | | S | | | R | H | | | | | | | | | | | | | | | S27? |
| **Rumex rupestris** | **Shore dock** | **E** | | **W** | | **8** | | | | | | | | | | | | | | | **z** | **SD, SM, S!** |
| Ruppia cirrhosa | Spiral tasselweed | E | S | W | NI | | H | | | | | | | | | | | | | | | SM2, Coastal saltmarsh |
| Sagina maritima | Sea pearlwort | | | | NI | | H | | | | | | | | | | | | | | | Coastal mosaic |
| Sagina nivalis | Snow pearlwort | | S | | | R | H | | | | | | | | | | | | | | | CG11, U14? |
| Sagina saginoides | Alpine pearlwort | | S | | | | H | | | | | | | | | | | | | | | CG10, CG12, U14 |
| Salicornia pusilla | One-flowered glasswort | E | | W | | | H | | | | | | | | | | | | | | | SM13 |
| Salix arbuscula | Mountain willow | | S | | | | H | | | | | | | | | | | | | | | CG14 |
| Salix herbacea | Dwarf willow | | | | NI | | H | | | | | | | | | | | | | | | Montane heath |
| Salix lanata | Woolly willow | | S | | | R | H | | | | | | | | | | | | | | | U16, W20 |
| Salix lapponum | Downy willow | E | S | | | | x | | | | | | | | | | | | | 13 | | W20, CG14, U16 |
| Salix myrsinites | Whortle-leaved willow | | S | | | | H | | | | | | | | | | | | | | | U16, CG14, W20 |
| Salix reticulata | Net-leaved willow | | S | | | | H | | | | | | | | | | | | | | | U16-17, CG14, W20 |
| Salvia pratensis | Meadow clary | E | | W | | 8 | H | | | | | | | | | | | | | | | CG2-6 |

[4] Use Suite 12 guidance for Welsh populations and Suite 13 guidance for Scottish populations.

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sarcocornia perennis | Perennial glasswort | E | | W | | | H | | | | | | | | | | | | | | x | | SM4, SM6-8, SM10-14, SM22, SM25 |
| Saxifraga aizoides | Yellow saxifrage | | | | NI | | H | | | | | | | | | | | | | | | | Upland mosaic |
| Saxifraga cernua | Drooping saxifrage | | S | | | 8 | H | | | | | | | | | | | | | | | | CG12 |
| Saxifraga cespitosa | Tufted saxifrage | | S | W | | 8 | H | | | | | | | | | | | | | | | | CG12 |
| **Saxifraga hirculus** | **Yellow marsh saxifrage** | **E** | **S** | | **NI** | **8** | | | | | | | | | | | | | | | | **z** | **M38** |
| Saxifraga hypnoides | Mossy saxifrage | | | | NI | | H | | | | | | | | | | | | | | | | Upland calcareous grassland, Upland mosaic |
| Saxifraga nivalis | Alpine saxifrage | E | S | W | | | | | | | | | | | | | | | | 13 | | | CG12, U15 |
| Saxifraga oppositifolia | Purple saxifrage | | | | NI | | H | | | | | | | | | | | | | | | | Inland rock |
| Saxifraga rivularis | Highland saxifrage | | S | | | R | H | | | | | | | | | | | | | | | | U11, U15 |
| Saxifraga stellaris | Starry saxifrage | | | | NI | | H | | | | | | | | | | | | | | | | Upland mosaic |
| Scandix pecten-veneris | Shepherd's-needle | E | | W | | | | | | | | | | | 8 | | | | | | | | OV15 |
| Scheuchzeria palustris | Rannoch rush | | S | | | R | H | | | | | | | | | | | | | | | | M1 |
| Schoenoplectus triqueter | Triangular club-rush | E | | | | 8 | | | | | | | | | | | | | | | | z | S? |
| Schoenus ferrugineus | Brown bog-rush | | S | | | R | H | | | | | | | | | | | | | | | | M10 |
| Scilla autumnalis | Autumn squill | E | | | | | H | | | | | | | | | | | | | | | | CG1, MC5, H7, OV34 |
| Scilla verna | Spring squill | | | | NI | | H | | | | | | | | | | | | | | | | Coastal mosaic |
| Scirpoides holoschoenus | Round-headed club-rush | E | | W | | R | | | | | | | | | | | | | | | | z | |
| Scirpus sylvaticus | Wood club-rush | | | | NI | | H | | | | | | | | | | | | | | | | Woodland, Fens, Upland oakwood |
| Scleranthus perennis ssp perennis | Perennial knawel | | | W | | 8 | | | | | | | | 7 | | | | | | | | | U1 |
| Scleranthus perennis ssp prostratus | Perennial knawel | E | | | | 8 | | | | | | | | 7 | | | | | | | | | U1 |
| Scorzonera humilis | Viper's grass | E | | W | | 8 | H | | | | | | | | | | | | | | | | M23-24 (wet pastures) |
| Scrophularia scorodonia | Balm-leaved figwort | E | | | | | | | 2 | | | | | | | x | | | | | | | SD6! |
| Sedum forsterianum | Rock stonecrop | E | | W | | | | | | | | | | | | | | | 12 | | | | CG1 |
| Sedum villosum | Hairy stonecrop | E | S | | | | H | | | | | | | | | | | | | | | | M10, M32, M32, M38 |
| Selinum carvifolia | Cambridge milk-parsley | E | | | | 8 | H | | | | | | | | | | | | | | | | M24 |
| Senecio cambrensis | Welsh groundsel | | | W | | R | | | x | x | | | | | | 9 | | | | | | | |
| Senecio paludosus | Fen ragwort | E | | | | 8 | | | | | | | | | | | | | | | | z | |
| Seseli libanotis | Moon carrot | E | | | | R | H | | | | | | | | | | | | | | | | W21, CG3 |
| Sesleria caerulea | Blue moor-grass | E | S | | | | H | | | | | | | | | | | | | | | | MG2, CG8-9, CG14 |
| Sibbaldia procumbens | Sibbaldia | | S | | | | H | | | | | | | | | | | | | | | | CG10-12, U10-14, U18 |
| Sibthorpia europaea | Cornish moneywort | E | | W | | | H | | | | | | | | | | | | | | | | W, Carr woodland, M |
| Silene acaulis | Moss campion | | | | NI | | H | | | | | | | | | | | | | | | | Inland rock |
| Silene conica | Sand catchfly | E | | | | | | | | | | x | x | 7 | | | | | | | | | CG7, U1 |
| Silene gallica | Small-flowered catchfly | E | | W | | | | | | | | 5 | | | x | | | | | | | | OV2, OV6 |
| Silene nutans | Nottingham catchfly | E | S | W | | | | | | | | | | | | | | | | | | z | MG1, MC4, MC8, MC11, OV39, OV41 |
| Silene otites | Spanish catchfly | E | | | | R | | | | | | | | 7 | | | | | | | | | CG7, U1 |
| Sisyrinchium bermudiana | Blue-eyed-grass | | | | NI | | H | | | | | | | | | | | | | | | | Lowland meadow and pasture, Purple moor-grass and rush pasture |
| Sium latifolium | Greater water-parsnip | E | | | NI | | H | | | | | | | | | | | | | | | | M9, A4, S4, S18, S24, S27, Fens |
| Sorbus anglica | Whitebeam | E | | W | | R | | | | | | | | | | | | | 12 | | | | |
| Sorbus arranensis | Arran whitebeam | | S | | | R | | | | | | | | | | | | | | | | z | |
| Sorbus bristoliensis | Bristol whitebeam | E | | | | R | | | | | | | | | | | | | 12 | | | | |
| Sorbus devoniensis | Whitebeam | E | | | | | | | 2 | | | | | | | | | | | | | | |
| Sorbus domestica | Service-tree | E | | W | | R | | | | | | | | | | | | | 12 | | | | |
| Sorbus eminens | Whitebeam | E | | W | | R | | | | | | | | | | | | | 12 | | | | CG10 |
| Sorbus lancastriensis | Whitebeam | E | | | | R | | | | | | | | | | | | | 12 | | | | |
| Sorbus leptophylla | Whitebeam | | | W | | R | | | | | | | | | | | | | 12 | | | | CG10 |
| Sorbus leyana | Ley's whitebeam | | | W | | R | | | | | | | | | | | | | 12 | | | | CG10 |
| Sorbus minima | Lesser whitebeam | | | W | | R | | | | | | | | | | | | | 12 | | | | CG10 |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sorbus porrigentiformis | Whitebeam | E | | W | | | | | | | | | | | | | | 12 | | | | | |
| Sorbus pseudofennica | Arran service-tree | | S | | | R | | | | | | | | | | | | | | | | z | |
| Sorbus rupicola | Rock whitebeam | E | S | W | | | | | | | | | | | | | | 12 | | | | | |
| Sorbus subcuneata | Whitebeam | E | | | | R | | | | | | | | | | | | 12 | | | | | |
| Sorbus vexans | Whitebeam | E | | | | R | x | | | | | | | | | | | 12 | | | | | W |
| Sorbus wilmottiana | Whitebeam | E | | | | R | | | | | | | | | | | | 12 | | | | | |
| Spartina maritima | Small cord-grass | E | | | | | H | | | | | | | | | | | | | | | | SM4, SM6-8, SM10-14, SM22, SM25 |
| Spergularia bocconei | Greek sea-spurrey | E | | | | R | | | | | | | | | 9 | | | | | | | | |
| Spiranthes romanzoffiana | Irish lady's-tresses | E | S | | NI | | | | | | | | | | | | | | | | | z | M15, M23, M25, Purple moor-grass and rush pasture, Wet heath, Upland mosaic |
| Spirodela polyrhiza | Greater duckweed | | | | NI | | H | | | | | | | | | | | | | | | | Brackish lake |
| Stachys alpina | Limestone woundwort | E | | W | | 8 | | 1 | | | | | | | | | | | | | | | |
| Stachys germanica | Downy woundwort | E | | | | 8 | | | 2 | | | | | | | | | | | | | | |
| Stellaria palustris | Marsh stitchwort | | | | NI | | H | | | | | | | | | | | | | | | | Reed beds and swamp, Fens |
| Stratiotes aloides | Water-soldier | E | | | | | H | | | | | | | | | | | | | | | | A4, A11 |
| Suaeda vera | Shrubby sea-blite | E | | | | | H | | | | | | | | | | | | | | x | | SM13-14, SM17, SM21, SM24-25 |
| Subularia aquatica | Awlwort | | | | NI | | H | | | | | | | | | | | | | | | | Eutrophic lake |
| Teesdalia nudicaulis | Shepherd's cress | | | | NI | | H | | | | | | | | | | | | | | | | Coastal sand dune |
| Tephroseris integrifolia ssp integrifolia | Field fleawort | E | | | | | H | | | | | | | | | | | | | | | | CG2-5 |
| Tephroseris integrifolia ssp maritima | South Stack fleawort | | | W | | 8 | H | | | | | | | | | | | | | | | | MC5, MC8, MC9 |
| Teucrium botrys | Cut-leaved germander | E | | | | 8 | | | | | | 5 | | | | | | | | | | | |
| Teucrium chamaedrys | Wall germander | E | | | | R | H | | | | | | | | | | | | | | | | CG2-4 |
| Teucrium scordium | Water germander | E | | | | 8 | H | | | | | | | | | | | | | | | | SD, Fens? |
| Thelypteris palustris | Marsh fern | E | S | W | NI | | H | | | | | | | | | | | | | | | | W2, W5, S24-25, Wet woodlands |
| Thesium humifusum | Bastard-toadflax | E | | | | | H | | | | | | | | | | | | | | | | CG2-3, CG5 |
| Thlaspi caerulescens | Alpine pennycress | E | S | W | | | H | | | | | | | | | | | | | | | | OV37 |
| Thlaspi perfoliatum | Perfoliate pennycress | E | | | | 8 | | | | | | 5 | | | | | | | | | | | CG, OV |
| Thymus serpyllum | Breckland thyme | E | | | | R | | | | | | | | 7 | | | | | | | | | CG7, U1 |
| Tilia platyphyllos | Large-leaved lime | E | | W | | | H | | | | | | | | | | | | | | | | W8 |
| Tordylium maximum | Hartwort | E | | | | R | | | | 3 | | | | | | | | | | | | | |
| Torilis arvensis | Spreading hedge-parsley | E | | | | | | | | | | | | | 8 | | | | | | | | OV |
| **Trichomanes speciosum (sporophyte)** | **Killarney fern** | **E** | **S** | **W** | **NI** | **8** | | | | | | | | | | | | | | | | **z** | **W11, Inland rock** |
| Trifolium bocconei | Twin-headed clover | E | | | | R | H | | | | | | | | | | | | | | | | H6-7 (?), OV34, MC |
| Trifolium glomeratum | Clustered clover | E | | | | | | | | | | 5 | x | x | | | | | | | | | U1f |
| Trifolium incarnatum ssp molinerii | Long headed clover | E | | | | R | H | | | | | | | | | | | | | | | | MC |
| Trifolium occidentale | Western clover | E | | W | | | H | | | | | | | | | | | | | | | | MC5, MC8-10 |
| Trifolium ochroleucon | Sulphur clover | E | | | | | H | | | | | | | | | | | | | | | | MG5 |
| Trifolium squamosum | Sea clover | E | | W | | | | | | | | | | | | | | | | | 14 | | SM, MG |
| Trifolium striatum | Knotted clover | | | | NI | | H | | | | | | | | | | | | | | | | Coastal mosaic |
| Trifolium strictum | Upright clover | E | | W | | R | H | | | | | | | x | | | | | | | | | MC, U1 |
| Trifolium suffocatum | Suffocated clover | E | | | | | | | | | | | 6 | | | | | | | | | | U1, MC5, OV2 |
| Trinia glauca | Honewort | E | | | | R | H | | | | | | | | | | | | | | | | CG1 |
| Trollius europaeus | Globe-flower | | | | NI | | H | | | | | | | | | | | | | | | | Wet woodlands |
| Tuberaria guttata | Spotted rockrose | | | W | | R | H | | | | | | | | | | | | | | | | H7, MC9 |
| Ulmus plotii | Plot's elm | E | | W | | | | | 2 | | | | | | | | | | | | | | W |
| Vaccinium microcarpum | Small cranberry | E | S | | | | H | | | | | | | | | | | | | | | | M19 |
| Valerianella eriocarpa | Hairy-fruited cornsalad | E | | W | | R | | | | | | 5 | | | x | | | | | | | | |
| Valerianella rimosa | Broad-fruited cornsalad | E | | | | R | | | | | | | | | 8 | | | | | | | | |
| Verbascum lychnitis | White mullein | E | | | | | | x | | | | 5 | | | | x | | | | | | | |

| Latin name | English name | Countries | | | | Status | Habitat | Suites | | | | | | | | | | | | | | Individual | Communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Verbascum pulverulentum | Hoary mullein | E | | | | | | | | | | | | | 9 | | | | | | | | |
| Verbascum virgatum | Twiggy mullein | E | | | | | | | | x | | 5 | | | x | | | | | | | | |
| Veronica alpina | Alpine speedwell | | S | | | | H | | | | | | | | | | | | | | | | CG12 |
| Veronica fruticans | Rock speedwell | | S | | | R | H | | | | | | | | | | | | | | | | CG14 |
| Veronica spicata ssp hybrida | Spiked speedwell | E | | W | | 8 | H | | | | | | | | | | | | | | | | CG1, CG9 |
| Veronica spicata ssp spicata | Spiked speedwell | E | | | | 8 | | | | | | | | 7 | | | | | | | | | CG7, U1 |
| Veronica triphyllos | Fingered speedwell | E | | | | 8 | | | | | | | | x | 8 | | | | | | | | OV3 |
| Veronica verna | Spring speedwell | E | | | | R | | | | | | | | 7 | | | | | | | | | CG7 |
| Vicia bithynica | Bithynian vetch | E | | W | | | | | 2 | | x | | | | | | | | | | | | |
| Vicia lathyroides | Spring vetch | | | | NI | | H | | | | | | | | | | | | | | | | Coastal sand dune |
| Vicia lutea | Yellow-vetch | E | S | | | | | | | | | | | | | | | | | | | z | |
| Vicia parviflora | Slender tare | E | | | | | | | 2 | | x | | | | x | | | | | | | | MG, OV |
| Vicia sylvatica | Wood vetch | | | | NI | | H | | | | | | | | | | | | | | | | Coastal mosaic, Upland mixed ashwood |
| Viola canina ssp montana | Heath dog-violet | E | | | | R | H | | | | | | | | | | | | | | | | M |
| Viola kitaibeliana | Dwarf pansy | E | | | | R | | | | | | | | | | | | | | | | z | |
| Viola lactea | Pale dog-violet | E | | W | | | H | | | | | | | | | | | | | | | | H3, H8 |
| Viola persicifolia | Fen violet | E | | | NI | 8 | H | | | | | | | | | | | | | | | | M, Fens |
| Viola rupestris | Teesdale violet | E | | | | R | H | | | | | | | | | | | | | | | | CG9-10 |
| Vulpia ciliata ssp ambigua | Bearded fescue | E | | W | | | | | | | | | 6 | x | | | | | | | | | SD |
| Vulpia fasciculata | Dune fescue | E | | W | | | H | | | | | | | | | | | | | | | | SD7 |
| Vulpia unilateralis | Mat-grass fescue | E | | | | | | | | | | 5 | | | x | | | | | | | | CG, OV |
| Wolffia arrhiza | Rootless duckweed | E | | W | | | H | | | | | | | | | | | | | | | | A1, A3, S14 |
| Woodsia alpina | Alpine woodsia | | S | W | | 8 | | | | | | | | | | | | | | 13 | | | CG14, U15 |
| Woodsia ilvensis | Oblong woodsia | E | S | W | | 8 | | | | | | | | | | | | | | 13 | | | |
| Zostera angustifolia | Narrow-leaved eelgrass | E | S | W | NI | | H | | | | | | | | | | | | | | | | SM1, Coastal saltmarsh |
| Zostera marina | Eelgrass | E | S | W | NI | | H | | | | | | | | | | | | | | | | SM1, Coastal saltmarsh |
| Zostera noltei | Dwarf eelgrass | E | S | W | NI | | H | | | | | | | | | | | | | | | | SM1, Coastal saltmarsh |

## Appendix 3. Species that require modifications to habitat guidance

### 1. Cicerbita alpina ( Alpine Sow-thistle)

Much of what is needed to be recorded is covered in section 4.8.3 of the Uplands Habitats Guidance. The species occurs in U16 community. The important items to check are grazing level, rock falls, and presence of reproductive parts. The grazing level is given as 'no more than light'. With at least 50% of each tall herb species present potentially having flowering stems present. In the case of Cicerbita, ideally there should be no grazing at all, and 50% damage is too great. So amend to be 'no more than 10% grazed shoots' for this species.

### 2. Linnaea borealis ( Twinflower)

This species occurs in W18 and W19 communities. The important factor to record is the state of the dwarf shrub layer, which should not be tall and/or closed. The presence of a moss layer and definite moisture content at ground level are also items worth noting, although these would normally be present in these communities.

### 3. Primula scotica ( Scottish primrose)

This species occurs in several communities, MC9, MC10 and CG14. It requires the presence of some open ground into which to seed and spread. If this is not present in some patches near the present colonies then the colony will not persist in the long-term. Natural exposure at coastal sites will provide this, but at some sites further inland, some light grazing may be appropriate to maintain suitable conditions.

**Appendix 4. Attributes and targets tables for species suites 1-14**

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of disturbed areas within woodland (Suite 1)**

All species in this group require disturbed areas within woodland on a recurring basis (the frequency of disturbance will vary between species but it should normally occur during the autumn and winter months).

Assessment of indirect attributes could be undertaken at any time. The key time for visiting the species in flower will depend on the species present. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>EITHER No decline of more than 10% in overall number<br>OR No decline greater than one population size category | Count of functional individuals | The species in this suite are commonly found scattered throughout a site, or occur in clumps, stands or colonies. These may vary in their overall distribution within a site as suitable conditions occur i.e. open patches for germination and establishment of young plants. Unless there are fewer than 100 individuals (when an individual count is generally possible) on the site, counts of clumps, stands or colonies should be made or assessed in the categories (101-300; 301-1 000; 1 001-3 000; 3 001-10 000; more than 10 000). |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No net loss of area of suitable habitat | Mapping (area) | Baseline extent of available niche may need to be determined by a specialist. There should be good spatial connectivity between frequently disturbed areas (e.g. tracksides, clearings) to facilitate dispersal (important for species with short-lived seed banks or very small populations) and/or reliable return of disturbed conditions at the same place, usually on a longer time scale (especially important for species with long-lived seed banks and/or larger populations). |

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| Disturbance | Signs of physical disturbance obvious over at least 30% of the suitable niche (autumn and winter disturbance often as a result of vehicle movements, forestry operations or brief use of site by stock although sometimes only dependent on the continuing use of paths or even wild animal tracks) | Visual assessment | Although most of these species can survive for substantial periods in the seed bank, sustainable populations will probably have some plants above ground in most seasons. An appropriately managed wood (or a wood with appropriately managed areas within it) should show signs of autumn or winter disturbance. A few of the species listed here appear to be adapted to infrequent gap creation (e.g. *Stachys alpina*) and undisturbed periods (e.g. 5 to 10 years) are probably quite acceptable. The specialist should provide details of such individual species requirements when baseline niche mapping. |
| Negative indicators: physical damage | Signs of stock grazing no more than rare. Signs of deer grazing no more than occasional. | Visual assessment | None of the species here are particularly tolerant of continuous grazing and many are highly intolerant. There should be no more than light grazing pressure and minimal levels of ground disturbance during the summer and early autumn months. |
| Negative indicators: shading | Shrub or tree cover should be < 50% over recently disturbed areas | Visual assessment | Although the species listed here are generally quite tolerant of shading, they tend to require lighter conditions during their regeneration phases (seedling establishment) and often also need relatively open conditions to induce flowering and achieve reasonable seed set. |

| **Species included in Suite 1** | **Species with Suite 1 as a secondary habitat** |
|---|---|
| *Bromopsis benekenii* | *Althaea hirsuta* |
| *Campanula patula* | *Fallopia dumetorum* |
| *Carex depauperata* | *Verbascum lychnitis* |
| *Carex digitata* | |
| *Cynoglossum germanicum* | |
| *Euphorbia serrulata* | |
| *Hordelymus europaeus* | |
| *Lithospermum purpureocaeruleum* | |
| *Melampyrum cristatum* | |
| *Melittis melissophyllum* | |
| *Ornithogalum pyrenaicum* | |
| *Pulmonaria longifolia* | |
| *Stachys alpina* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of hedgerows, hedge banks and green lanes (Suite 2)**

All species in this group benefit from the relatively open but protected environment associated with hedgerows, road verges (especially away from the road's edge) and the margins of green lanes.

The time of visit will depend on the species present. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory except the last, which should only be assessed when periodic disturbance forms a part of the management regime. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 10% overall loss in terms of individuals, clumps, etc. throughout the total available niche | Extent (metres) or count of functional individuals | With a few of the species in this suite, e.g. the trees *Pyrus cordata* and *Sorbus devoniensis*, it is possible to count individuals in total or over a length of the site, but most of the other species occur in patches as clumps or colonies, so it will be possible to define the outer boundaries of these. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No net loss of length or width of suitable habitat | Mapping (area) | Baseline extent of available niche may need to be determined by a specialist. Such situations experience a wide range or management and the niche will not always occupy the full length of a boundary. |
| Negative indicators: damage to structure | Signs of damage to the established structure no more than rare | Visual assessment | Most hedges, verges, etc. have long established management regimes leading to a stable structure at the macro-scale. |

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| Negative indicators: physical damage | Signs of stock grazing no more than rare | Visual assessment | None of the species here are particularly tolerant of continuous grazing and many are highly intolerant. There should be no more than light grazing pressure and minimal levels of ground disturbance during the summer and early autumn months. |
| Negative indicators: shading (attribute only to be assessed when disturbed areas present) | Shrub or tree cover should be < 50% over any recently disturbed areas | Visual assessment | Although the species listed here are generally quite tolerant of shading, they tend to require lighter conditions during their regeneration phases (seedling establishment) and often also need relatively open conditions to induce flowering and achieve reasonable seed set. |

| **Species included in Suite 2** | **Species with Suite 2 as a secondary habitat** |
|---|---|
| *Clinopodium menthifolium* | *Carex depauperata* |
| *Fallopia dumetorum* | *Hordelymus europaeus* |
| *Fumaria occidentalis* | *Lathyrus aphaca* |
| *Lonicera xylosteum* | *Lithospermum purpureocaeruleum* |
| *Pyrus cordata* | *Melampyrum cristatum* |
| *Scrophularia scorodonia* | *Melittis melissophyllum* |
| *Sorbus devoniensis* | *Senecio cambrensis* |
| *Stachys germanica* | |
| *Ulmus plotii* | |
| *Vicia bithynica* | |
| *Vicia parviflora* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of scrub margins and grassland/scrub mosaics (Suite 3)**

All species in this group benefit from the relatively open but protected environment associated with the margins of scrub within calcareous grassland. Such situations experience a wide range of effective management.

The time of visit should be in the summer. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>EITHER No decline of more than 10% in overall number<br>OR No decline greater than one population size category | Count of functional individuals | Many of these species occur as individuals or as small groups. It should be possible to make counts as the total numbers will often be less than 100. Where the numbers exceed this, then they should be assessed in the categories 101-300, 301-1 000, 1 001-3 000, 3 001-10 000, more than 10 000. |
| Successful regeneration | At least 10% of the population producing mature seedpods | Count of fruiting heads | Although many of these species are long-lived they do depend on seed production to colonize new areas. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No net loss of area or edge of suitable habitat | Mapping (either area of scattered scrub or scrub edge length) | Baseline extent of available niche may need to be determined by a specialist. Maintaining the area of scattered scrub or, where the scrub occurs in discrete blocks, its edge (quality and extent), will involve manipulating grazing pressures such that scrub expansion is checked without elimination of the scrub and open areas of grassland are retained with some direct intervention. |

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|---|---|---|---|
| Grassland condition | Favourable condition in the established areas of grassland | According to habitat guidance | Apply relevant attributes from the grassland condition assessment chapter to the established areas of grassland only (i.e. ignore the scrub component when making this assessment by reference to baseline mapping). |
| Negative indicators: physical damage | Signs of spring and summer stockgrazing (browsing/poaching) no more than occasional | Visual assessment | None of the species here are particularly tolerant of continuous grazing and many are highly intolerant. There should be no more than light grazing pressure and minimal levels of ground disturbance during the spring and summer months. |
| Negative indicators: shading | Tree cover less than 25% | Visual assessment | Although the species listed here are generally quite tolerant of shading, they tend to require lighter conditions during their regeneration phases (seedling establishment) and often also need relatively open conditions to induce flowering and achieve reasonable seed set. A woodland over-storey (which provides shade but little or no protection from herbivores) should not be allowed to develop. The ideal is to provide maximum protection from grazing with minimal shade (in the form of scrub edge). |

| **Species included in Suite 3** | **Species with Suite 3 as a secondary habitat** |
|---|---|
| *Aceras anthropophorum* | *Orobanche caryophyllacea* |
| *Carex muricata* ssp *muricata* | *Senecio cambrensis* |
| ***Cypripedium calceolus*** | *Verbascum virgatum* |
| *Epipactis atrorubens* | |
| *Gentianella germanica* | |
| *Orchis purpurea* | |
| *Orchis simia* | |
| *Orobanche hederae* | |
| *Orobanche rapum-genistae* | |
| *Rosa agrestis* | |
| *Tordylium maximum* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of lightly managed grasslands (Suite 4)**

Plants in this group are characteristically tall or scrambling species adapted to growing in tall undisturbed grasslands ranging from the scrub ecotone (including many road verges) to open grasslands on low nutrient soils. Occasional cutting or light grazing is tolerated. There is a persistent seed bank in many cases.

The time of visit should be in the summer. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 10% loss in overall number of groups | Extent or count of groups | Most of these species occur in clumps or colonies and it should be possible to define the limits of these groups throughout the site. |
| Successful regeneration | At least 10% of the population producing mature seedpods | Count of fruiting heads | These species depend upon on seed production for longer-term dispersal and survival strategies. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of grassland habitat to maintain population<br><br>No loss of grassland habitat | Mapping | Extent of available habitat needs to be mapped. |
| Vegetation structure: sward height | > 80% tall grasses present | Visual assessment | On strongly calcareous soils these will particularly include *Bromopsis erectus* and *Brachypodium pinnatum*/*sylvaticum*. |
| Negative | < 20% scrub present | Visual assessment | Excessive shade is undesirable and will eliminate these species |

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| indicators: shading | | | over time. |
| Host species (attribute only to be assessed for *Orobanche* spp.) | Strong populations of necessary host species present (e.g. broom, gorse, thistles, yarrow; check individual species requirements) | Visual assessment | Spatial targets could be appropriate for assessing this attribute. |

| **Species included in Suite 4** | **Species with Suite 4 as a secondary habitat** |
|---|---|
| *Bunium bulbocastanum* | *Ornithogalum pyrenaicum* |
| *Cirsium tuberosum* | *Orobanche rapum-genistae* |
| *Clinopodium calamintha* | *Vicia bithynica* |
| *Himantoglossum hircinum* | *Vicia parviflora* |
| *Lathyrus aphaca* | |
| *Orobanche caryophyllacea* | |
| *Orobanche purpurea* | |
| *Orobanche reticulata* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of disturbed/heavily managed grasslands, crumbly turf, path edges, etc. (Suite 5)**

This suite comprises species occurring in short, open, drought-prone, nutrient-poor grasslands in the lowlands which are subject to relatively high levels of disturbance and/or intensive management. Often these species are restricted to localized areas of open ground (e.g. along trackways, path edges, field margins, in disused pits and quarries, on stony banks and around rabbit scrapes and burrows) set within a matrix of denser/taller grassland or scrub. Whilst the suite is centred on *grassland*, there is considerable overlap with other habitats, especially arable headlands and sandy waste ground. Many species listed here are also included in closely related suites (particularly suites 7-9). Suite 5 species are found in a wide range of grassland types, including *dune* grassland (e.g. *Hypochaeris glabra*), calcicolous grassland (e.g. *Cerastium pumilum* in CG1) and acidic grassland (e.g. *Trifolium glomeratum* in U1), and includes NVC communities CG7, U1, SD, OV.

It is best to visit between May and August, though most indirect attributes can be adequately assessed at other times of the year. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Successful regeneration | At least 25% of the population producing ripe fruit | Count of fruiting heads | Mainly annuals depending on good seed production from year to year for continued survival. Some of these species produce large groups each year, but it will be possible to count a sub-sample of the population and extrapolate. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat (though spatial arrangement of habitat 'patches' can change from year to year) | Mapping (area of grassland and length of linear features) | Baseline survey required to establish extent of suitable habitat. Many colonies of these species are in long-established habitats (e.g. open grassland around rock outcrops or on steep south-facing slopes), but others are more 'opportunistic', colonising intermittently suitable habitat patches whenever they become available (e.g. colonising open ground cleared of scrub). |
| Bare ground | > 5% bare soils or stones | Visual assessment | Most 'suite 5 species' are restricted to broken ground or open-textured swards with 5-20% bare ground in summer (in winter may be much higher than this); baseline survey will help to establish appropriate levels of bare ground for particular species and sites. |
| Vegetation structure: sward height | In summer general sward height < 10 cm | Measure with ruler | All these species (other than *Bunium*) require a short sward; as a rule, taller swards (10-20 cm) can only be tolerated if amounts of bare ground are high |

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| | At least 20% of the sward forming patches < 2 cm | | (> 20%). NB: Take weather patterns into account - in 'wet' years some habitat patches can look 'too rank', but quickly open up again with the return of drier weather. |
| Disturbance | Signs of heavy grazing and/or trampling and/or cutting and/or ground disturbance (e.g. shallow ploughing) | Visual assessment | Many of these species favour areas subject to frequent and intensive management (often more intensive than, at first glance, would be thought suitable for the vegetation type in which they occur). Examination of vegetation structure will usually indicate whether the site is in favourable condition for 'suite 5 species', but signs of relevant management activities will also provide useful supporting evidence. |
| Negative indicators: enchroachment | No signs of encroachment by taller vegetation (coarse grass, scrub or tree growth) | Visual assessment | These species are usually restricted to relatively sheltered, warm, sunny locations. Neighbouring scrub or woodland may help to create the right microclimatic conditions, but intervention may be necessary if woody vegetation or coarse grassland threatens to encroach onto open ground. |

| **Species included in Suite 5** | **Species with Suite 5 as a secondary habitat** |
|---|---|
| *Ajuga chamaepitys* | *Apera interrupta* |
| *Althaea hirsuta* | *Bunium bulbocastanum* |
| *Anagallis minima* | *Filago gallica* |
| *Cerastium pumilum* | *Medicago minima* |
| *Dianthus armeria* | *Medicago sativa* ssp *falcata* |
| *Dianthus deltoides* | *Silene conica* |
| *Filago lutescens* | |
| *Filago pyramidata* | |
| *Gastridium ventricosum* | |
| *Hypochaeris glabra* | |
| *Iberis amara* | |
| *Marrubium vulgare* | |
| *Medicago polymorpha* | |
| *Petroselinum segetum* | |
| *Silene gallica* | |
| *Teucrium botrys* | |
| *Thlaspi perfoliatum* | |
| *Trifolium glomeratum* | |
| *Valerianella eriocarpa* | |
| *Verbascum lychnitis* | |
| *Verbascum virgatum* | |
| *Vulpia unilateralis* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of disturbed/compacted, often summer-parched/winter-wet areas on sand-dunes, shingle, and sea-cliffs, and of sandy waste ground near the sea (Suite 6)**

This suite is, essentially, a wetter (and more *coastal*) version of suite 5, being typically associated with summer-parched/winter-wet, disturbed and compacted soils on sand-dunes, shingle, sea-cliffs and other sandy ground near the sea. There is some overlap with other suites (especially 5, 7 and 9).

Most species are visible (flowering) during April-June, but indirect attributes can be readily assessed at any time; winter visits, in particular, can be useful for assessing hydrology. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 10% loss either in amount of area colonised or in the overall number of individual clumps | Extent (metres) or numbers of clumps | *Asplenium obovatum* and *septentrionale* occur in clumps, mainly on exposed sea cliffs, and can be counted. *Carex maritima* tends to form mats or stands on wet sand just above the strandline and is best assessed by its extent as it is impossible to separate one individual from another in the field. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat (though spatial arrangement of habitat 'patches' can change from year to year) | Mapping (area) | Baseline survey required to establish extent of suitable habitat. Many colonies of these species are in long-established habitats (e.g. 'slack' grasslands on sand-dune golf course fairways), but others are more 'opportunistic', colonising intermittently suitable habitat patches whenever they become available (e.g. pathways cleared of scrub). |
| Bare ground | > 5% bare ground | Visual assessment | Bare ground is essential for seed germination and seedling establishment; most 'suite 6 species' occur in open-textured swards with > 5% (often > 20%) bare ground in spring/early summer (in late summer-autumn-early winter may be much higher than this due to 'disappearance' of early annuals); baseline survey will help to establish appropriate levels of bare ground for particular species and sites |
| Vegetation structure: sward height | > 50% of sward < 2 cm sward height | Measure with ruler | These species favour very short (heavily grazed/trampled/mown) swards; sometimes these can be extensive (e.g. golf course fairways), but usually |

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| | | | they occur as localized patches within a matrix of unsuitable habitat (e.g. on pathsides, trackways, picnic areas and car-parks!). |
| Hydrology | Signs of flooding or direct evidence of dampness in winter | Visual assessment | Most 'suite 6 species' (apart from *Erodium moschatum*) favour ground that is dry in summer but damp or intermittently flooded in winter. Direct evidence of 'winter dampness', along with the 'right' vegetation structure, is probably the best predictor of favourable condition for most species in this suite. |
| Negative indicators: shading | No shading; no encroachment of scrub or tall grassland | Visual assessment | All these species are restricted to very open, unshaded situations, though some of the dune annuals can occur along scrub margins (and can quickly colonise areas cleared of scrub). Intervention may be necessary if scrub or rank grassland threatens to encroach onto open ground. |
| Negative indicators: soil nutrient status | *Poa annua* and/or *Plantago major* ssp *major* should be no more than occasional/< 5% cover | Associated species (DAFOR) | All 'suite 6 species' occur on disturbed but relatively impoverished (infertile) soils. The abundance of ruderal species indicative of nutrient enrichment would indicate unfavourable condition. *Poa annua* and *Plantago major* ssp *major* are good indicators of eutrophication in heavily disturbed sites; following baseline survey, further species could be added to this list on a site-by-site basis. NB: the much smaller, and mainly coastal, taxon *Plamtago major* ssp *intermedia* is perfectly acceptable, and is *not* indicative of unacceptable nutrient status. |

| **Species included in Suite 6** | **Species with Suite 6 as a secondary habitat** |
|---|---|
| *Asplenium obovatum* | *Hypochaeris glabra* |
| *Carex maritima* | *Silene conica* |
| *Crassula tillaea* | *Trifolium glomeratum* |
| *Erodium moschatum* | |
| *Mibora minima* | |
| *Petrorhagia nanteuilii* | |
| *Poa bulbosa* | |
| *Poa infirma* | |
| *Polycarpon tetraphyllum* | |
| *Romulea columnae* | |
| *Trifolium suffocatum* | |
| *Vulpia ciliata* ssp *ambigua* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of heath grass ecotones (Suite 7)**

Heath-grass ecotones, drought-prone and disturbed in sandy situations (U1-type and SD communities centred on the Breck. A group of species which occur on field margins, banks, near rabbit burrows and track margins in sandy disturbed areas where drought conditions are frequent. These species do not necessarily grow together and require slightly different conditions. *Herniaria glabra* and *Scleranthus perennis* ssp *prostratus* are poor competitors that are able to grow in compacted ground, e.g. on trackways, closely mown turf, or, in the case of *Herniaria*, occasionally flooded pits.

The time of visit varies from February for *Gagea bohemica* to October for *Artemisia campestris*, but centres around May-August. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 10% loss either in area colonised or in the overall number of individual clumps | Extent (metres) or count of clumps | Only suitable for monitoring the perennial species. These include: *Gagea bohemica, Herniaria glabra, Medicago sativa* ssp *falcata, Muscari neglectum, Phleum phleoides, Scleranthus perennis, Silene otites*, *Thymus serpyllum* and *Veronica spicata* ssp *spicata*. |
| Successful regeneration | At least 10% of the population producing mature seedpods | Count of fruiting heads | Annual species tend to have large population fluctuations and are better assessed by their successful regeneration. In some cases it would be possible to count viable seed, but in some species the seed is very small (and note that for *Gagea bohemica* reproduction is entirely vegetative). It may be necessary to assess whether the seed contained in the fruiting heads is viable, rather than assuming that it is. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Bare ground | > 5% sandy open ground | Visual assessment | For most species this is essentially a measure of some |

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|---|---|---|---|
| | *Herniaria* and *Scleranthus* should have EITHER moderately used trackways with some vegetation and > 10% bare ground, OR very short turf < 2 cm tall | | disturbance. Some blowing sand off tracks, presence of some rabbit burrows, low sandy banks are necessary to provide the niche for these species. For *Herniaria* and *Scleranthus* it is EITHER a measure of areas of broken turf, with small patches of bare ground (trackways should be moderately used with some vegetation still in the vehicle ruts), OR areas of grassland with short turf and patches of open ground that can be maintained either by mowing or by rabbit grazing. |
| Negative indicators: shading | > 5% scrub or coarse vegetation | Visual assessment | Species do not grow in shade or in coarse vegetation (tall tussocky grasses). |

| **Species included in Suite 7** | **Species with Suite 7 as a secondary habitat** |
|---|---|
| *Apera interrupta* | *Filago lutescens* |
| *Artemisia campestris* | *Filago pyramidata* |
| *Gagea bohemica* | *Hypochaeris glabra* |
| *Herniaria glabra* | *Pilosella peleteriana* ssp *subpeleteriana* |
| *Medicago minima* | *Trifolium glomeratum* |
| *Medicago sativa* ssp *falcata* | *Trifolium strictum* |
| *Muscari neglectum* | *Veronica triphyllos* |
| *Petrorhagia prolifera* | *Vulpia ciliata* ssp *ambigua* |
| *Phleum phleoides* | |
| *Scleranthus perennis* ssp *perennis* | |
| *Scleranthus perennis* ssp *prostratus* | |
| *Silene conica* | |
| *Silene otites* | |
| *Thymus serpyllum* | |
| *Veronica spicata* ssp *spicata* | |
| *Veronica verna* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of arable areas (Suite 8)**

All species in this group require open conditions. Low or no competition and preferably no or little herbicide or fertiliser treatments. Stubbles, conservation headland and uncropped strips are currently ideal. Regular disturbance (cultivation) is essential.

The time of visit should be in July-August for most flowering, but autumn/winter visit would be useful for late-flowering species. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | No more than 50% loss in area covered (given at least a minimum area covered) | Extent – metres | These species often occur in swathes, so a realistic measurement is the extent of the patches. |
| Successful regeneration | At least 10 individuals producing mature seed | Estimate of viable seed | It will be necessary to collect a sample of seedpods from at least 10 plants and check that the seeds are no empty shells but contain some genetic material. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | No loss in area of margins, headlands etc. (given at least a minimum viable niche size) | Mapping (area) | Uncropped area may move around field, but there should be no loss in overall area left cultivated but uncropped. |
| Vegetation structure | One or more margins in a field with > 80% open ground | Visual assessment | All species are poor competitors and mostly fail within an intensively managed crop. Look for signs of a weak crop, or absence, and a lack of competitors in suitable areas (headlands, margins, uncropped strips and throughout field). |
| Disturbance | Whole area should show signs of regular cultivation | Visual assessment | Spring sown crops should be sown no earlier than mid March, autumn sown no earlier than the end of September. A proportion of the interest species are primarily spring |

| | | | |
|---|---|---|---|
| | | | germinators, some autumn germinators. When managing a site for a range of arable species, the ideal situation is to alternate cultivation. |
| Negative indicators: soil nutrient status | Presence of negative indicators (nettles, cleavers, docks and chickweed) no more than rare | Visual assessment, DAFOR scale could be used | Soils should be low in nutrients to allow plants to compete alongside nutrient-demanding undesirable species. |

| **Species included in Suite 8** | **Species with Suite 8 as a secondary habitat** |
|---|---|
| *Adonis annua* | *Ajuga chamaepitys* |
| *Apera spica-venti* | *Althaea hirsuta* |
| *Centaurea cyanus* | *Apera interrupta* |
| *Echium plantagineum* | *Filago lutescens* |
| *Euphorbia platyphyllos* | *Filago pyramidata* |
| *Filago gallica* | *Fumaria occidentalis* |
| *Fumaria densiflora* | *Gastridium ventricosum* |
| *Fumaria parviflora* | *Iberis amara* |
| *Fumaria purpurea* | *Medicago polymorpha* |
| *Fumaria reuteri* | *Minuartia hybrida* |
| *Fumaria vaillantii* | *Petroselinum segetum* |
| *Galeopsis angustifolia* | *Silene gallica* |
| *Galium tricornutum* | *Valerianella eriocarpa* |
| *Melampyrum arvense* | *Vicia parviflora* |
| *Scandix pecten-veneris* | |
| *Torilis arvensis* | |
| *Valerianella rimosa* | |
| *Veronica triphyllos* | |

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## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of ruderal areas (Suite 9)**

These species grow in a range of marginal spaces: waste ground, on walls and between paving stones. The habitat is weedy, generally with bare ground (or concrete, etc.) and open vegetation. Species are often poor competitors, and may cycle between being abundant following disturbance to the site, and being present only in the seed bank if the vegetation becomes too dense or scrubby. Some species are known to have long-lasting seed, and should probably not be expected to produce plants every season. These marginal habitats are uncommon in the protected site series, and many sites for these species are not protected.

Assessment of indirect attributes could be undertaken at any time. The key time for visiting the species in fruit will depend on the species present. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Successful regeneration | At least 10% of the population producing mature fruits | Count of fruiting heads | As most of these species are annuals, seed production is the survival mechanism. Fruiting heads are relatively easy to count and seed is known to be generally viable. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No net loss of area (or length on a wall) of suitable habitat | Mapping (area or length) | Baseline survey required to establish extent of suitable habitat. Sites will vary between having fairly stable areas of waste ground or other stable habitat, and those in which the areas of bare weedy ground are transient following periodic disturbance. Management should aim to maintain the same overall area of transient disturbed areas, although these areas may move around the site. |
| Vegetation structure | Open vegetation with >20% bare ground | Visual assessment | All of these species require open vegetation with bare ground, at least for seed germination. On some sites, a higher target for bare ground will be appropriate. |

| | | | |
|---|---|---|---|
| Disturbance | Evidence of regular disturbance | Visual assessment | Disturbance is necessary to maintain the open conditions required by these species. Disturbance need not be annual, but should be at regular intervals. On wall sites this attribute may not be appropriate, as the limited area available for colonisation will tend to maintain open conditions. |
| Negative indicators: shading | Absence of scrub and tall grass/herb cover | Visual assessment | These species prefer open habitats without shading. Encroachment by scrub and tall vegetation needs to be prevented by management intervention. *Lavatera cretica* can survive in more shaded situations (e.g. hedges). |

| **Species included in Suite 9** | **Species with Suite 9 as a secondary habitat** |
|---|---|
| *Anisantha madritensis* | *Apera spica-venti* |
| *Arabis glabra* | *Clinopodium calamintha* |
| *Bupleurum falcatum* | *Dianthus armeria* |
| *Centaurea calcitrapa* | *Draba muralis* |
| *Chenopodium vulvaria* | *Erodium moschatum* |
| *Galium parisiense* | *Filago lutescens* |
| *Lavatera cretica* | *Fumaria occidentalis* |
| *Minuartia hybrida* | *Lathyrus aphaca* |
| *Senecio cambrensis* | *Medicago polymorpha* |
| *Spergularia bocconei* | *Poa infirma* |
| *Verbascum pulverulentum* | *Scrophularia scorodonia* |
| | *Verbascum lychnitis* |
| | *Verbascum virgatum* |
| | *Vulpia unilateralis* |

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## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of nutrient rich ponds and pond margins (Suite 10)**

This group of species requires a well circumscribed set of conditions: open, muddy ground, seasonally flooded, often trampled and containing eutrophic conditions. Plants in this suite may grow submerged (*Limosella*) or on bare mud (*Cyperus*).

Can be assessed throughout year. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 50% loss in overall extent | Extent – metres | Those species that are aquatic or emergent may form floating mats, so a measurement of surface area covered should be obtainable. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of area of muddy pond margin | Mapping (area) | Range of conditions from wet (sometimes inundated) mud to dry (or damp) marginal mud should be preserved. |
| Vegetation structure | Encroaching vegetation such as flote grass, willowherb, nettles, creeping bent, no more than rare | Visual assessment, DAFOR scale could be used | Needs to be minimal or absent. The development of thick marginal (and sublittoral) vegetation indicates unfavourable condition. |
| Bare ground | > 90% of margin to be open bare mud | Visual assessment | This applies in early summer before any buried seed germinates. Ponies or cattle are suitable to prevent competing vegetation and to expose the seed bank. |

| **Species included in Suite 10** |
| --- |
| *Alisma gramineum* |
| *Cyperus fuscus* |
| *Damasonium alisma* |
| *Galium constrictum* |
| *Limosella aquatica* |
| *Ludwigia palustris* |
| *Persicaria mitis* |
| *Ranunculus ophioglossifolius* |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of ephemeral ponds, ruts and puddles (Suite 11)**

These species all favour areas of seasonal winter flooding. *Illecebrum verticillatum* has two main centres of distribution, Cornwall and the New Forest; in these areas it favours stream sides and tracks.

The site will require two visits: one when the site is at its wettest, and one in the summer when the species are in flower. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 10% loss in overall coverage of the population | Extent – metres | These species usually occur in swards or patches. They may be underwater, so wellingtons and a glass-bottomed bucket are advisable. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No net loss of area or length of suitable habitat | Mapping (either area or length) | Baseline extent of available niche may need to be determined by a specialist. All species. |
| Hydrology | Signs of flooding or direct evidence of dampness in winter | Visual assessment | All species. |
| Vegetation structure | Scruffy margins | Visual assessment | *Limosella aquatica* does not want ‘neat and tidy’ areas. |
| pH | pH 5-6.01 | pH meter | *Crassula tillaea* only, growing on heathland tracks. |

| | | | |
|---|---|---|---|
| Disturbance | Evidence of poaching or regular disturbance | Visual assessment | *Mentha pulegium*, *Cyperus fuscus* and *Ranunculus tripartitus*. Grazing is also required by *Isoetes histrix*, *Chamaemelum nobile*, *Juncus capitatus* and *Cicendia filiformis*. *Juncus* pygmaeus needs regular disturbance. Some trampling will help to distribute the spores of *Isoetes histrix*. |
| Negative indicators: competition | < 5% cover provided by species other than the target species | Visual assessment | *Crassula tillaea*, *Chamaemelum nobile*, *Lycopodiella inundata*, *Ranunculus tripartitus* all prefer no competition. *Pulicaria vulgaris*, *Juncus capitatus*, *Cicendia filiformis* and *Deschampsia setacea* prefer open ground and reduced competition. |
| Negative indicators: shading | Absence of scrub and tall grass | Visual assessment | *Cyperus fuscus* should have a lack of scrub invasion. |

| **Species included in Suite 11** | **Species with Suite 11 as a secondary habitat** |
|---|---|
| *Chamaemelum nobile* | *Crassula tillaea* |
| *Cicendia filiformis* | *Cyperus fuscus* |
| *Deschampsia setacea* | *Limosella aquatica* |
| *Illecebrum verticillatum* | *Pilularia globulifera* |
| *Isoetes histrix* | |
| *Juncus capitatus* | |
| *Juncus pygmaeus* | |
| *Lycopodiella inundata* | |
| *Mentha pulegium* | |
| *Pulicaria vulgaris* | |
| *Ranunculus tripartitus* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of limestone pavements, limestone cliffs, limestone scree and shillow (Suite 12)**

All species in this group benefit from the open, often summer-parched, environment associated with the shallow soils of these sites. The habitat includes A2.2, B3.1, H8.1, I1.1, I1.2.2.

Can be assessed throughout year. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size: number | At least a minimum viable population size present AND<br><br>EITHER No decline of more than 10% in overall number<br>OR No decline greater than one population size category | Count of functional individuals | All the *Sorbus* species will be identifiable as individual trees or saplings, whilst the other species in this suite grow in clumps or groups. Where there are fewer than 100 individuals a full count should be made. Larger populations, clumps or groups should be assessed in the categories 101-300, 301-1 000, 1 001-3 000, 3 001-10 000, more than 10 000. |
| Population size: extent | No more than 10% loss in total area covered by the population | Mapping | Although it will be possible to count individuals in the majority of cases, the nature of the terrain in which some of these species grow means that they are not very accessible. It should be possible to scan with binoculars and to map out the main localities over the whole site. |
| Successful regeneration | At least 10% of the total population producing fruits, spores or seeds | Visual assessment | In most cases it will be possible to establish whether regenerative material is produced even if plants are viewed through binoculars. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No net loss of area or length of cliff | Mapping (either area or length) | Baseline extent of available niche may need to be determined by a specialist. Such situations tend to require little or no management, although some may be prone to invasion by alien species, especially shrubs (e.g. Cotoneaster) or trees (e.g. Norway maple). Maintaining the open area may involve some direct intervention (e.g. scrub control) or even the use of controlled browsing livestock (but see below). |
| Negative indicators: physical damage | Signs of stock grazing no more than occasional | Visual assessment | None of the species here are particularly tolerant of continuous grazing and many are highly intolerant. There should be no more than light grazing |

| | | | |
|---|---|---|---|
| | | | pressure and minimal levels of ground disturbance especially during the spring and early summer months. Some browsing animals may assist in the control of invasive woody species but care should be taken in their use, especially in the spring and early summer. |
| Negative indicators: shading | Tree/shrub cover should be < 10% | Visual assessment | The species listed here are generally light demanding species requiring relatively open conditions to induce flowering and achieve seed set. A woody overstorey should not be allowed to develop and may need controlling manually although light browsing may help in this respect. Note that *Sorbus* species are trees! |
| Negative indicators: competition | Associated vegetation should be open and should not overtop the target species | Visual assessment | The species listed here are generally poorly competing species requiring relatively open, competition-free conditions for survival. A bulky competitive sward should not be allowed to develop. Such conditions will normally be produced by summer droughting. However, some management input may be required (usually very carefully controlled grazing) if the site has a tendency to develop an aggressively bulky community. |

| **Species included in Suite 12** | **Species with Suite 12 as a secondary habitat** |
|---|---|
| *Allium sphaerocephalon* | *Draba aizoides* |
| *Arabis scabra* | *Ononis reclinata* |
| *Aster linosyris* | |
| *Cotoneaster integerrimus* | |
| *Dianthus gratianopolitanus* | |
| *Draba muralis* | |
| *Geranium purpureum* | |
| *Pilosella flagellaris* ssp *bicapitata* | |
| *Potentilla rupestris* | |
| *Sedum forsterianum* | |
| *Sorbus anglica* | |
| *Sorbus bristoliensis* | |
| *Sorbus domestica* | |
| *Sorbus eminens* | |
| *Sorbus lancastriensis* | |
| *Sorbus leptophylla* | |
| *Sorbus leyana* | |
| *Sorbus minima* | |
| *Sorbus porrigentiformis* | |
| *Sorbus rupicola* | |
| *Sorbus subcuneata* | |
| *Sorbus vexans* | |
| *Sorbus wilmottiana* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of high-altitude screes and cliffs (Suite 13)**

All species in this group benefit from the open, ungrazed conditions found outwith the natural niche of overstorey trees or robust scrub (usually above the natural tree line or on very exposed sites). A2.2 (scattered scrub), C2 (upland species-rich ledges), I1.1 (natural inland cliff), I1.2 (scree), I1.4 (natural exposure).

Can be assessed throughout year. If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size: number | At least a minimum viable population size present AND<br><br>EITHER No decline of more than 10% in overall number<br>OR No decline greater than one population size category | Count of functional individuals | These species grow as discrete individuals or in groups. Most of them are very restricted in their extent on the ground and so can be relatively easily counted. A total count for the smaller populations should be made i.e. less than 100 individuals. Larger populations should be assigned to the categories 101-300, 301-1 000, 1 001-3 000, 3 001-10 000, more than 10 000. |
| Poulation size: extent | No more than 10% loss in total area covered by the population | Mapping | Although it will be possible to count individuals in the majority of cases, the nature of the terrain in which some of these species grow means that they are not very accessible. It should be possible to scan with binoculars and to map out the main localities over the whole site. |
| Successful regeneration | Count of fruiting heads/fertile fronds/catkins should not be significantly reduced from baseline OR<br>At least 10% of the total population producing fruits, spores or seeds | Count of fruiting parts OR<br>Production of fruit/spores/seed | Although some individuals will grow on higher ledges that are not easily reached, it will be possible to distinguish the fern fronds that are producing spores on the more accessible areas, and to see seed heads or fruiting heads/catkins on other species. OR<br>In most cases it will be possible to establish whether regenerative material is produced even if plants are viewed through binoculars. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No net loss of area or length of cliff | Mapping (either area or length) | Baseline extent of available niche may need to be determined by a specialist. Such situations tend to require little or no management, although some may be prone to invasion by competitive alien species (e.g. *Rhododendron*). Maintaining the open area may involve some direct intervention (e.g. scrub control). |
| Negative indicators: physical damage | Signs of stock grazing absent. Signs of grazing or browsing by wild mammals no more than rare. | Visual assessment | The species here are generally quite intolerant of grazing, although some grazing by molluscs, birds and small mammals is likely to be a natural component of their environment and may represent a natural limiting factor to population size/extent). There should be no stock grazing pressure. Some browsing by larger native mammals may occur from time to time but significant levels should be a cause for concern (e.g. by heavy browsing by deer). |
| Negative indicators: competition | Associated vegetation should not include competitive alien species (especially *Rhododendron ponticum*) | Visual assessment | The species listed here are generally poorly competing species requiring relatively open, competition-free conditions for survival. Some alien species are capable of out-competing native species in this habitat and *Rhododendron ponticum* is the primary species involved. Some management input may be required in such circumstances (usually direct removal of the alien). |

| Species included in Suite 13 | Species with Suite 13 as a secondary habitat |
|---|---|
| *Arabis petraea* | *Betula nana* |
| *Athyrium flexile* | *Carex muricata* ssp *muricata* |
| *Carex atrata* | *Cerastium alpinum* |
| *Circaea alpina* | *Epipactis atrorubens* |
| *Dryopteris submontana* | |
| *Gymnocarpium robertianum* | |
| *Hieracium* Sect. *Alpestria* | |
| *Lychnis alpina* | |
| *Poa flexuosa* | |
| *Potentilla rupestris* | |
| *Salix lapponum* | |
| *Saxifraga nivalis* | |
| *Woodsia alpina* | |
| *Woodsia ilvensis* | |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature: Vascular plant species of coastal embankments, sea-walls, open poached, dry or periodically inundated brackish or saline muds (Suite 14)**

This group of species requires a habitat mosaic of dry to seasonally wet brackish conditions with a range of vegetation structures from bare ground to coarse grasses with scattered scrub.

The time of visit should be from July to September (although the indirect attributes may be assessed at any time). If in doubt consult a specialist. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory for the species indicated. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 10% loss in overall coverage of the population | Extent – metres | Most of these species occur in a restricted band so an estimate or measurement of the area covered is possible. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Disturbance | Evidence of regular disturbance adjacent to borrow dyke and at seepage points along the sea wall berm (e.g. by poaching animals) | Visual assessment | Acceptable levels of open ground may be created by vehicles/farm machinery using berm. Mandatory for: *Bupleurum tenuissimum*, *Hordeum marinum*, *Parapholis incurva*, *Polypogon monspeliensis*, *Puccinellia fasciculata*, *Puccinellia rupestris*, *Trifolium squamosum*. |
| Hydrology | Land subject to seasonal inundation by brackish to salt water | Visual assessment | Mandatory for: *Althaea officinalis*, *Atriplex pedunculata*, *Chenopodium chenopodioides*, *Lepidium latifolium*, *Parapholis incurva*, *Polypogon monspeliensis*, *Puccinellia fasciculata*. |

| | | | |
|---|---|---|---|
| Hydrology | Seasonally wet conditions which dry out during the summer months | Visual assessment | Mandatory for: *Hordeum marinum*, *Parapholis incurva*, *Puccinellia rupestris*, *Trifolium squamosum*. |
| Hydrology | Dry conditions throughout the year | Visual assessment | Mandatory for: *Lactuca saligna*, *Peucedanum officinale*. These species prefer dry exposed conditions, and can thrive on sites such as sea-walls. |
| Vegetation structure | > 20% bare ground in suitable niche | Visual assessment | Mandatory for: *Atriplex pedunculata*, *Chenopodium chenopodioides*, *Hordeum marinum*, *Polypogon monspeliensis*, *Puccinellia fasciculata*, *Puccinellia rupestris.* |
| Vegetation structure | Open vegetation in suitable niche | Visual assessment | Mandatory for: *Bupleurum tenuissimum*, *Lepidium latifolium*, *Parapholis incurva*, *Trifolium squamosum*. |
| Vegetation structure | Area dominated by coarse grasses with scattered scrub and bare ground | Visual assessment | Mandatory for: *Althaea officinalis*, *Lactuca saligna*, *Peucedanum officinale*. |
| Negative indicators: physical damage | No evidence of mowing or grazing | Visual assessment | Mandatory for: *Althaea officinalis*, *Peucedanum officinale*. |

| **Species included in Suite 14** | **Species with Suite 14 as a secondary habitat** |
|---|---|
| *Alopecurus bulbosus* | *Lathyrus aphaca* |
| *Althaea officinalis* | *Medicago minima* |
| *Atriplex pedunculata* | *Sarcocornia perennis* |
| *Bupleurum tenuissimum* | *Suaeda vera* |
| *Chenopodium chenopodioides* | |
| *Hordeum marinum* | |
| *Lactuca saligna* | |
| *Lepidium latifolium* | |
| *Parapholis incurva* | |
| *Peucedanum officinale* | |
| *Polypogon monspeliensis* | |
| *Puccinellia fasciculata* | |
| *Puccinellia rupestris* | |
| *Trifolium squamosum* | |

## Appendix 5. Attributes and targets tables for species with individual guidance

### UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

### Interest feature: *Allium ampeloprasum* (Wild leek)

This is a plant of rough, usually open ground and tall vegetation on or near the coast. Habitats include abandoned fields and waste places, sea-cliffs, by track- or path-sides, on road verges and in Cornish 'hedges'. It is generally intolerant of excessive shading from competing scrub and dislikes moderate- or high-intensity management (e.g. stock grazing, spring or summer cutting, burning, ploughing) – but some patchy and/or irregular management is desirable to maintain regeneration niche availability. In the British Isles this species includes three sub-taxa, one of which (var. *babingtonii*) is a British-and-Irish endemic, while another (var. *bulbiferum*) is endemic to the Channel Islands. Var. *babingtonii* is the main taxon in S.W. England, though var. *ampeloprasum* occurs on Steep Holm.

The indirect attributes can be assessed throughout year. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline mapping of available habitat may need to be done by a specialist. Requires open ground with some disturbance, although often with long periods of relative stability (tens of years). Fully stabilized vegetation with woody competition is, however, unsuitable. Whilst this species is somewhat mobile, dispersal is poor, and new habitat patches should have good connectivity to existing populations. |
| Bare ground | > 5% bare ground within the mapped limits of suitable habitat | Visual assessment | The niche must include some capacity for regeneration – *A. a.* produces bulbils (var. *babingtonii*) or rather heavy seeds (var. *ampeloprasum*) which require disturbed ground or crevices for establishment. |
| Negative indicators: competition | Scrub should be no more than occasional within the mapped limits of suitable habitat | Visual assessment | Scattered scrub will not pose a problem but competition from dense scrub, development of extensive stands of scrub, is likely to be detrimental. |
| Negative indicators: physical damage | No signs of regular or extensive management including cutting, burning, stock grazing and cultivation | Visual assessment | Many sites are on abandoned land and succession on such sites will require occasional *ad hoc* or 'patchy' management. Very occasionally sites will need to be more regularly managed (e.g. road verges or hedges) – such management should be confined to the autumn and winter. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Allium schoenoprasum*** **(Chives)**

This species is restricted to sparsely vegetated areas on thin, drought-prone soils and rocky ground. Habitats include rock crevices, boulder screes, and shallow stony depressions within heathland (as on the Lizard in Cornwall). In its most accessible sites, for example on the Lizard track-ways and footpaths, it could be vulnerable to management-induced changes, but on the whole this species occurs in hard-to-access, inhospitable places, and is unlikely to be under any significant threat from humans.

It is best to visit when the plant is in flower (June-August). Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline extent of available habitat may need to be assessed by a specialist. In the main, the available niche for *A. s.* is determined by underlying edaphic (geological and hydrological) conditions, with management playing a relatively minor role in creating and maintaining appropriate habitat conditions. |
| Vegetation structure | Open vegetation with bare ground | Visual assessment | On sites that are track-way/footpath (as on the Lizard), the continued usage will be important to maintain open conditions. In these sites management may be more significant; need to ensure that these route-ways are used (but not over-used). Equally, route-ways supporting *A. s.* should not be upgraded/metalled or subjected to infilling with hard-core, which could completely destroy the habitat. |
| Negative indicators: shading | No shading by scrub | Visual assessment | *A. s.* requires open, sunny, scrub-free conditions, and usually occurs on infertile drought-prone substrates where extensive scrub growth is unlikely. |
| Negative indicators: physical damage | No signs of grazing, cutting or burning on a regular basis | Visual assessment, possibly from more than one site visit | *A. s.* is controlled principally by edaphic, climatic and geomorphological factors, meaning that frequent or intensive management is probably not required and may in fact be detrimental. This may require more than one visit to determine whether damage is regular or only occasional. |

# UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Apium repens*** **(Creeping marshwort)**

The plant occurs in short, grazed mesotrophic, inundated grassland (MG11, MG13) where a degree of trampling causes disturbance, providing open ground where the runners can root.

It is best to visit in July-August when they are potentially suffering drought. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No more than 10% loss in overall coverage of the population | Extent – metres | |
| Hybridization | > 80% of the population should be the true species | Check with specialist and assess proportion of intermediates | *Apium repens* has been believed to hybridize with *A. nodiflorum.* Some plants may appear intermediate. Check with specialist for current understanding, and identification of intermediates. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Vegetation structure: sward height | Average sward height 2-5 cm | Measure with ruler | Short turf to be maintained throughout the year. Currently and historically grazed by cattle and horses at high densities. |
| Hydrology | Presence of all: *Ranunculus flammula*, *Agrostis stolonifera*, *Alopecurus geniculatus*, *Potentilla anserina*, *Juncus articulatus*, *Ranunculus repens*, *Festuca rubra* within niche | Identify indicator species, it is not essential to find *every* species at *every* assessment point | These species provide evidence of a high seasonable water table. |
| Negative indicators: pollution | Nettles and other species associated with eutrophication absent from niche | Visual assessment | *A. r.* is vulnerable to pollution and eutrophication. |

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## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Arabis alpina*** **(Alpine rock-cress)**

This plant grows on a few shady ledges on basic cliffs at an altitude of about 850 m with a few mountain herbs and mosses nearby. It is not threatened by grazing owing to the relative inaccessibility of the sites but it could be damaged by inadvertent trampling by climbers and visiting botanists. The best assessment is the maintenance of the undisturbed nature of the wet rock crevices.

It is best to visit in June-August. All attributes are mandatory. If one attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Population size: number | No less than 50 individual plants in the different colonies in total | Count of individuals – through binoculars | Although this is a small number of individual plants, the population has never been a large one. Ideally, a viable population would consist of more than 100 individuals but the genetic resource can be contained within a few individuals. |
| Population size: extent | No loss in the overall number of colonies | Count of separate colonies – through binoculars | This species grows at 2 different locations on the site. Both these need to be checked and counted. At one location there are several colonies nearby but separate from each other. |
| Successful regeneration | At least 5% of the total population producing seedpods, and at least 10 young/seedling plants present | Count of seedlings and fruiting plants - from a safe distance | Wet, mossy patches are ideal for the establishment of young plants. In Scandinavia and Iceland the species grows on ledges that are on north or west-facing slopes and therefore in the shade. (Any future restocking projects should take this into account.) |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Negative indicators: physical damage | Little, preferably no, sign of trampling to the plants themselves and the nearby vegetation | Visual assessment - through binoculars | As this is the only site for this species in Britain and Ireland, it is visited by keen botanists. However, only the more adventurous are able to reach the main population, but the rock is wet and slippy so extreme care is required in order not to damage the mature plants or squash young seedlings. It is recommended that the plant is viewed through binoculars in order to prevent damage. Climbers may well visit this whole area but are less likely to tread on wet or vegetated rock preferring a clean surface in order to obtain a firm grip or tread. |

# UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Arenaria norvegica* ssp *anglica* (English sandwort)**

An annual (sometimes biennial) species of shallow depressions on limestone which are usually winter-wet and summer-parched. Competition from other vascular plants is minimal and only species such as *Sagina nodosa*, *Sedum villosum* and *Minuartia verna* are normally associated. Some populations occur in similarly competition-free ruts and hollows on tracks, where a degree of wear and disturbance is probably desirable in maintaining the niche. Occasionally this species is found in bryophyte-dominated basic flushes.

It is best to visit in May-September. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline mapping of available habitat may need to be determined by a specialist. Requires open ground almost free of competition from other vascular plants. The niche includes thin peaty soils around exposed limestone or in shallow depressions on outcrops, somewhat worn areas and ruts on tracks and bryophyte dominated flushes and springs with limited vascular plant development. |
| Negative indicators: competition | <40% vascular plant cover (contributed by species other than *Arenaria norvegica*) within the mapped area | Visual assessment | The niche is complex but freedom from competing vascular plants is the key factor – this may be produced by summer parching (the most frequent case), light erosion by vehicles or pedestrians or flushed conditions unfavourable to the development of vascular plant communities. |
| Negative indicators: encroachment | No encroachment onto the niche by adjacent vegetation | Visual assessment | The niche is usually fragmentary within a matrix of calcareous grassland. If this grassland is allowed to become too rank there is a risk that it may overtop the small areas in which *Arenaria norvegica* grows. This may be a particular risk on track sites if the tracks are abandoned or if the nutrient status of the surrounding land is enhanced. |
| Negative indicators: physical damage | Minimal signs of damage to or loss of the thin peaty soils in limestone depressions, or around the margins of limestone exposures, or excessive wear on track sites | Visual assessment | The limestone hollow or outcrop margin sites are primarily determined by summer drought and are unlikely to suffer direct damage. The track populations, however, probably require light levels of use during the autumn and winter, but excessive use appears to be a problem. Flush sites could be adversely affected by poaching associated with excessive livestock densities. |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Asplenium septentrionale*** **(Forked spleenwort)**

A small, clump-forming, winter-green fern of freely draining, natural or man-made situations, usually in association with dark-coloured, base-poor rock types. The species is largely confined to fully exposed, north-facing crevices on rock exposures, quarry faces or earthy, rubble-filled or half-mortared walls. Occasionally metal-rich quarry or mine spoil sites are colonised. Competition from other vascular plant species is poorly tolerated; associates are generally lower plants.

It is possible to visit at any time of year, although a summer visit will give the best indication of problems arising from competition. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline surveys will be required to indicate the extent of suitable habitat. Suitable habitat will have the following attributes: vertical crevices in open, base-poor situations usually on natural rock exposures, quarry faces, earthy, rubble-filled or partly mortared walls or open spoil heaps. |
| Negative indicators: shading | < 5% shade | Visual assessment | *A. s.* requires light and airy conditions with relatively low air humidity. |
| Negative indicators: competition | < 5% cover provided by other vascular plant species | Visual assessment | Most *A. s.* situations naturally support very little competing vegetation, but creeping species such as *Rubus fruticosus* or woody invaders of crevices (e.g. *Calluna vulgaris*) may need to be kept at bay. |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Asplenium trichomanes*** **ssp** ***pachyrachis*** **(Lobed maidenhair spleenwort)**

A small, delicate, clump-forming fern, usually growing with fronds adpressed in fissures on natural limestone or calcareous sandstone exposures or on mortared walls of ancient buildings; especially castles. This subspecies is largely confined to very sheltered sites, especially beneath overhangs that keep water away from the crown. High humidity also seems important and the majority of localities are north facing and frequently sheltered by trees. Vascular plant associates are rare, with other ferns and bryophytes dominating the communities.

It is possible to visit at any time of year, although late summer visits may give the best indication of problems arising from desiccation. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline surveys will be required to indicate the extent of suitable habitat. Suitable habitat will have the following attributes: overhung crevices in sheltered, base-rich situations either on shaded natural rock exposures or mortared walls in humid positions. |
| Vegetation structure: shading and shelter | Naturally north-facing OR > 50% shade from trees/scrub<br>Shelter providing some degree of protection from direct wetting at the crown | Visual assessment | *A. t.* ssp *p*. requires humid conditions with overhead protection to reduce the indicence of water settling around the crown. These conditions are frequently provided by natural rock exposures, but, where the plant is found growing on walls and dependent upon aspect and prevailing abiotic conditions, it may be necessary to maintain some sheltering tree or scrub cover. |
| Negative indicators: physical damage | No signs of management affecting the suitable habitat | Visual assessment | Prevent tidying and clearance of crevices or repair of overhangs by over enthusiastic site custodians – particularly relevant where the plant grows on the walls of important historic buildings. |

# UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Atriplex praecox*** **(Early orache)**

This plant grows in the lowest part of open strand communities - sand and shingle beaches on sheltered shores of Scottish sea-lochs. It exhibits protogyny, which means that it often hybridises with other *Atriplex* species. As long as the populations are not overgrazed, and open shoreline conditions remain, the species should continue to be in favourable condition. It is possible that in the long-term it will evolve naturally as a result of hybrid vigour and genetic out-crossing, which could ultimately lead to its demise. This is not a factor that we can control, but it is included here, as we do need to know whether it is taking place and whether the species does cease to exist in its own right. (Then the guidance will need to be rewritten). As this is an annual species, monitoring should preferably be done every year.

It is best to visit in June-September. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | Plants present along the strandline over several meters at the site | Measurement in field i.e. metres covered | The species will be scattered along the strandline and should be in an easily definable strip. It may well occur with other *Atriplex* and strandline species. |
| Hybridization | At least 10% of the population confirmed as the true species | Collection of sample and subsequent verification | Most *Atriplex* species are only positively identified from mature seeds which are produced in the autumn, and so this is the best time to collect and thereby assess the status of this and other *Atriplex* species. Collect a small number of plants and send to taxonomic expert for verification or visit the site with a competent botanist who can assess this in the field. |
| Successful regeneration | Presence of mature seedpods in at least 10% of the population | Visual assessment of presence of mature seed produced in the autumn | Orache plants often grow in abundance on the shoreline where there is little other vegetation and they can be very appealing to grazers. Some grazing is acceptable and may help to spread the seeds, but the continued survival of the plant is dependent on the production of seed each year. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Negative indicators: physical damage | No large scale removal of sand, shingle or gravel | Visual assessment and photographic record- taken from fixed points so that they can be compared with those from previous visits | There is nothing that can be done to control the force of the sea and winter gales which will often reshape the shoreline and sediments. Old niches may disappear but new ones will be created. However, removal of sediments for commercial purposes over much of the site could result in loss of the population and should not be allowed. |

# UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Calamagrostis purpurea*** **ssp** ***phragmitoides*** **(Scandinavian small reed)**

This is a plant of wet willow carr, often where there is standing water in winter. It also occurs in open marsh, wet ditches, old peat diggings and occasionally on drier banks. It is difficult to distinguish between this and the other subspecies, but there is only one area of Scotland where two of the subspecies grow nearby, so geographical location and mapping of the extent is a good basis for confirmation of favourable status (although all subspecies may be overlooked and under-recorded, so caution is required). The taxonomy of this species is still under development.

It is essential to visit when the grass is flowering in June and July. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | No more than a 10% loss of overall coverage in areas where it is dominant | Mapping in the field | This species is often locally abundant or dominant in small areas and it may be possible to map the extent of these on the ground. Where it is part of a diverse community, that will not be possible. Vegetative spread is thought to be the main method of reproduction. |
| Hybridization and taxonomy | Review the status of the species and adjust guidance accordingly | Taxonomy – check current status in botanical literature and with experts | This subspecies is the subject of current research and evaluation. It may change to being a species in its own right or it may become absorbed with other subspecies. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Hydrology | No significant lowering of water levels – the soil surface must contain some visible moisture | Visual assessment and hydrological measurements | Ideally, it would be appropriate to have peizometers set up on the sites to measure any changes in the water levels, as it is not always possible to see the changes directly. Where there are ditches and the water level can be seen directly, it will be possible to take a measuring stick and record the depth of water and compare this with previous records from site visits. However, the simplest method is to check that the soil surface itself is wet. |
| Negative indicators: physical damage | No drainage or direct habitat destruction | Visual assessment | This is the main threat to the species. |

# UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

## Interest feature: *Carex buxbaumii* (Club sedge)

A sedge of mesotrophic fens forming extensive patches on the margins of lochs often growing with other sedges. Also occurring by outflowing burns of lochs. All sites are subject to periodic flooding. The species will remain in favourable condition unless there are significant changes in disturbance, water levels, or physical alteration of the loch margins.

It is best to visit in June, July or August, but no later as the fruits are shed quickly, and thereafter positive identification is very difficult. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | Plant present either in a hydrospheral ring or over a total area of 5 square metres | Area covered in metres | At most of its sites it occurs along the edge of the lochan and in several discrete locations, but it can also form a distinct band. |
| Successful regeneration | At least 50 flowering or fruiting stems at the site | Presence of flowering or fruiting stems | This species can be a shy flowerer and the ripe fruits tend to fall very quickly, so July is probably the best period to assess this attribute. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Hydrology | No long-term reduction in water levels | Visual assessment | All known colonies are around loch margins where seasonal fluctuation of water levels occurs naturally. If there is long-term change, especially regarding lowering of the water levels, this is likely to be detrimental. If water level records are available for the area then these will assist in the monitoring process. |
| Negative indicators: damage to structure | No changes in the physical integrity of the lochs, margins or outflows | Visual assessment | Afforestation occurs in a few areas nearby the sites and this should be kept well back from the loch margins so as not to adversely affect the water levels or overall changes in the nutrient status of the water.<br>Planning applications in or near the area should be assessed to ensure that the hydrological regime is not altered significantly or the lochs destroyed. |
| Negative indicators: physical damage | No damage through heavy grazing - at least 50% of the stems should not be eaten | Visual assessment | Existing sites are lightly grazed and this does not have an adverse effect. It may be beneficial in spreading seeds. |
| Negative indicators: physical damage | No excessive trampling (mainly by fishermen) – complete flattening of areas of more than one metre square should not be present | Visual assessment | Several of the sites are used by fishermen, and excessive trampling in limited areas may occur, which would adversely affect the plant in the long-term. |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Carex flava*** **(Large yellow sedge)**

A plant of lagg and fen peat flushed with base-rich water. In Cumbria it occupies the transitional zone outwith the lagg stream of a raised mire, in an area of *Alnus* carr flushed with water from neighbouring limestone outcrops. The most difficult attribute to determine is the desirable level of shading – this is clearly a plant of open fen habitats over much of its range and may be maintained in such situations by grazing or cutting. In England *C. flava* is present at just a single site; declines in the past have been attributed to excessive shade, and limited coppicing of the alder appears to have halted the decline and initiated recovery. Achieving the correct balance between shading from the canopy cover and the likely increase in competition from other elements of the ground flora if the site is opened up too much will be critical.

It should be possible to assess the indirect attributes at any time of year. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline extent of available habitat may need to be determined by a specialist. Requires base-influenced lagg or fen conditions. Appears to be reasonably tolerant of shade and so may be found in either fen or open-canopied carr. |
| Vegetation structure: shading | 20-60% tree cover (contributed by broadleaved species only) within the area of suitable habitat | Visual assessment | Whilst often found in open fen on the continent it may be intolerant of excessive competition from the more robust vascular plant elements of unmanaged open lagg fen – some canopy cover may help to suppress this competition. |
| Hydrology | Signs of winter flooding and all year dampness | Visual assessment | Maintain the naturally high water table of the lagg fen/carr. Should be able to detect signs of water levels above ground level in winter (except in unusually dry seasons) and permanently damp conditions throughout the year. |

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## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Carex punctata*** **(Dotted sedge)**

This sedge is restricted to relatively sheltered coastal sites with an abundant supply of fresh water. It occurs on sea-cliffs along seepage lines, in flushes and beside freshwater 'trickles', on wet sandy patches in saltmarshes or where streams debouch onto the shore. It also occurs more rarely in dune-slacks and in estuarine alder-carr. It can be a difficult species to identify (very similar to *C. distans*), and often grows in sites that are hard to access.

The indirect attributes could probably be assessed at any time of year. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, spatial targets are advisable. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition. If the indirect attributes are met but the species cannot be found it must be referred to the Country Agency botanical specialists.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Mapping | Note that individual plants of *C. p.* may be short-lived, with populations fluctuating in size from year to year, and sometimes disappearing entirely, only to be found a few years later in another patch of suitable habitat nearby. It will be possible to estimate numbers of plants at some sites, and this should be done, but using count data to assess status is probably unreliable. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping | Baseline survey required to establish (1) extent of suitable habitat and (2) locations of existing *C. p.* colonies. Mapping may be difficult at some sites, where narrow seepage lines and other small patches of 'suitable habitat' are thinly distributed across vertical or near-vertical cliff-faces. |
| Hydrology | Evidence of water seepage in the vicinity of known *C. p.* colonies | Visual assessment | *C. p.* grows in areas with an abundant supply of fresh water, such as in crevices on sea-cliffs where trickles of water descend. It usually occurs beside seepages where water movement is easily discerned (when walking beneath sea-cliffs, and on raised beaches, look out for water debouching onto the shore). Water quality may be an issue, but (as with *Rumex rupestris*) little is known about its tolerance limits in terms of nutrient loadings, etc. |

# UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Carex recta*** **(Estuarine sedge)**

This species grows on the banks of tidal rivers and marshy flats, where silt is periodically deposited and the water table fluctuates seasonally. It is tolerant of natural water level changes, but physical alterations of the riverside banks e.g. by concreting or straightening, would be detrimental. This species is known to hybridise with other sedges. This cannot be prevented in the wild and it is part of the evolutionary process. However, we do need to record what is happening over time as it may be that Carex recta becomes hybridised out and therefore it would be inappropriate to continue to monitor it.

The time of visit should be from July to September. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Successful regeneration | At least 10% of the fruits produced containing viable material of the true species | Presence of flowering or fruiting stems | This species is partially fertile, which means that it is does not always produce a good quantity of flowers and fruit, so it will vary from year to year. The fruit ripens in August and September, depending on the seasonal variation. Some mature fruits should be collected in the autumn and checked to see that they contain viable material, i.e. they are not empty shells. Either take a taxonomic expert with you into the field or send the collected fruits to the expert. |
| Hybridization | At least 10% of the population confirmed as the true species | Identification | Collect and send a small number of the plants to taxonomic expert for verification, or visit the site with competent botanist who can assess this is the field. (This species is known to hybridise with *Carex aquatilis*.) |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping | It is not known why this species is restricted to 3 sites in Scotland, but there are clearly environmental factors which influence its distribution. Regular monitoring of its extent should provide early -warning system. |
| Hydrology | Signs of seasonal water level fluctuation, silt deposition and permanent wetness | Visual assessment | Water levels should be obvious from a field visit. There will be seasonal variation and this is perfectly acceptable and a requirement for the continued existence of the species. |
| Negative indicators: physical damage | No changes to the overall river structure, e.g. canalisation, or to the river flow | Visual assessment and planning consultation | Water flow and river margins are essential for the survival of the species. Any major riverside developments, especially upstream or adjacent to the sites should be assessed for possible impact. |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Carex vulpina*** **(True fox sedge)**

This is a large sedge of seasonally wet ground, as in ditches and on pond-sides. Taxonomic difficulties make ecological observations unreliable with regard to its preference for open versus shaded conditions. Drainage is a principal threat, along with the infilling or removal of ditches and ponds.

The time of visit should be in the summer (July-August). Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. Indirect attributes should be selected from the table that are suitable for the habitat. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area or, in the case of ditch/river margins, length) | Baseline extent of available habitat may need to be determined by a specialist. Seasonal inundation appears to be a common factor/requirement in many of its sites. |
| Bare ground | 10-30% bare ground in its usual ditch/pond margin habitats (**not** in flood plain grassland) | Visual assessment | Requirement for bare ground less important in flood plain grassland, more important in ditches, woodland, river margins. |
| Vegetation structure: shading | Only light shade present if plant occurs in woodland or shaded ditch<br>No scrub encroachment on flood plain grassland | Visual assessment | Plant may be able to tolerate some degree of shading such as from blackthorn, but consider scrub as negative in flood plain grassland. |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Centaurium tenuiflorum*** **(Slender centaury)**

In Britain, this spring-germinating annual is restricted to about 4 km of unstable Liassic cliffs on the Dorset coast. It is a poor competitor, favouring bare or sparsely vegetated ground on the ill-draining sandy or clay soils. Associated species include *Agrostis stolonifera*, *Blackstonia perfoliata*, *Centaurium erythraea*, *Samolus valerandi*, *Tussilago farfara* and *Isolepis cernua*. Access to populations is considered dangerous, and all assessments of direct attributes should be made using binoculars or by specialist climbers. Almost all populations of this species lie within National Trust ownership.

The time of visit should be from April to September for assessment of the integrity of the undercliff. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Coastal processes | Continued operation of natural coastal processes | Visual assessment | Need to ensure that natural coastal processes (including landslips) are allowed to continue. Whilst direct control of these processes is impossible, any attempts to stabilize the cliffs or to construct coastal defence works would be expected to have a damaging effect. |
| Vegetation structure: habitat mosaic | No change in overall proportions of 'open' and 'closed' habitats in mosaic<br>Open habitats to contain sparsely vegetated patches with any of: *Agrostis stolonifera*, *Blackstonia perfoliata*, *Centaurium erythraea*, *Samolus valerandi*, *Tussilago farfara* and *Isolepis cernua* | Aerial photography and identification of associated species | Competitive species (including scrub species) are undesirable, but landslips should continue to produce a plentiful supply of open patches. The overall balance between 'open' and 'closed' habitats could be monitored using aerial photographs, coupled with assessment of associated species on the ground. |

Issue date: February 2004

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

**Interest feature:** ***Cochlearia micacea*** **(Mountain scurvy-grass)**

An arctic-alpine, growing at altitudes between 610 and 1120 m, in a variety of habitats on basic substrates. Most typically found in flushes, springs and on stream-sides. Also found in short calcicolous turf, cliffs and ledges, stony gullies and ravines. The plant is fairly tolerant of grazing, and often grows in crevices where animal tongues cannot reach; so many colonies will continue to survive in these situations. The most vulnerable sites are those in flushes and springs, often in lush turf, which attract grazers, or are in areas where snow lies in winter and therefore on ski-runs. But the dwarf habitat of the species is often its best form of defence, and it is unlikely to be seriously threatened unless its mountain habitats disappear or global warming really takes effect.

The time of visit should be from June to September. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | Continuing presence of at least 10 individuals or clumps in a location | Count of individuals or clumps– binoculars may be needed for montane sites | On cliffs the individual plants may be well scattered, whilst in flushes and along streamsides it tends to occur in clumps. |
| Successful regeneration | At least 10% of the population flowering | Presence of flowers or fruit | Production of flowers varies from mid-May to September. Fruit may appear in late June. Previous observations have shown that fruiting is low (as little as 5%) in flushes but rather higher on cliffs. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Grazing | Signs of moderate grazing levels present | Visual assessment | The species seems to tolerate grazing and is unlikely to be severely affected by it. Grazing may provide some open patches in the turf in which seedlings can establish. There is also some evidence for vegetative reproduction. |
| Negative indicators: physical damage | No evidence of severe trampling, or of constructions associated with sports activities on the population locations themselves | Visual assessment and planning development consultation | As the plant grows on mountain rocks and in high-altitude short turf, it may be often in areas used for skiing or rock-climbing, but it has a low-growing habit and is unlikely to be eradicated by occasional activity. Liaison over possible mountain sports development facilities is recommended. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Coincya wrightii*** **(Lundy cabbage)**

This plant is an English endemic, restricted to Lundy. There it occurs in various cliff communities, in particular in the coastal extremities of the NVC W24, W25b and MC12a communities with *Pteridium aquilinum*, *Hyacinthoides non-scripta*, sparse *Rubus fruticosus* and *Teucrium scorodonia* where a degree of disturbance caused by slippage and possibly by trampling provides open ground for germination.

Two visits should be made: one in early June when *Coincya* is in flower, the second in mid-winter when young rosettes are most vulnerable to grazing. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site. Spatial targets may be used, the site is being divided into sub-sites by Roger Key and colleagues. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | Populations and sub-populations all present | Mapping | *C. w.* is a biennial/short-lived perennial. Numbers fluctuate greatly from year to year, due to weather conditions as much as to habitat change or management impacts. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping | Follow agreed framework as devised by Roger Key and colleagues. |
| Bare ground | 5-25% bare ground | Visual assessment | Bare ground is desirable for seed germination and seedling establishment. This needs to be naturally occurring bare ground, due to slope instability and drought rather than due to grazing or trampling. |
| Negative indicators: encroachment | Complete absence of *Rhododendron* from areas having *C. w.*, especially cliff-faces | Visual assessment | Areas colonized by *Rhododendron* can become quickly unsuitable for *C. w.* The extent of *Rhododendron* cover should be mapped every 5 years. Inaccessible areas of cliffs can be mapped using a boat. |
| Negative indicators: physical damage | No damage due to grazing | Visual assessment (evidence of stock access) | *C. w.* is susceptible to grazing, and there is no 'safe' season as far as grazing is concerned. On grazed sites bramble thickets can provide protection against stock access. A winter visit may be useful to assess grazing impacts, as this is when the young rosettes are most likely to suffer the effects of stock grazing. |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

### Interest feature: *Corallorhiza trifida* (Coralroot orchid)

This plant is apparently tolerant of a wide range of situations – normally dune-slack or damp woodland (either semi-natural or plantation, and usually dominated by pine, birch, alder or willow), but also including heather moorland, tall-herb fen and other situations which are relatively undisturbed and remain damp into the summer months. As the plant appears above ground only to flower – although it *can* photosynthesise, it obtains most of its nutrients *via* a combination of parasitism and saprophytism – and flowering can be unpredictable, direct assessments must take this into account, and ideally should be by continual annual recording.

The indirect attributes can be assessed at any time of year, direct attributes will have to be assessed when the orchid is in flower between April and August, although usually this is June-July. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline extent of available habitat may need to be determined by a specialist. Although *C. t.* thrives in a number of habitats it is restricted to quite specific niches in most of these (e.g. in sand dune systems it usually occurs in dune-slacks dominated by *Salix repens*). *C. t.* appears to have some requirement for shading by herbaceous and sub-shrub vegetation at ground level or by a tree canopy. |
| Hydrology | Dampness at the soil surface (or at least in the top 5 cm – use a trowel to pull back a small sample of soil if necessary) at all times | Visual assessment | Maintain the naturally occurring water table of the habitat (usually quite high, maintaining damp conditions at the surface, even in summer). Although the exact requirements with respect to this attribute are not clear, there are strong indications that *C. trifida* has quite narrow tolerances with respect to long-term fluctuations in the water table (some short periods of winter flooding are acceptable). An observer should be able to detect signs of long-term change in water levels either by physical signs of summer drought or by the invasion of weedy or more drought-tolerant vegetation (refer back to niche mapping indicators used above). |
| Negative indicators: disturbance | Signs of disturbance (e.g. by poaching etc.) no more than rare | Visual assessment | Although *C. t.* can tolerate some level of stock grazing (especially outside the flowering season) it does not generally do well in areas which are grazed heavily, poached or disturbed by ploughing etc. It is probably safest to avoid late spring and summer grazing altogether. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Corrigiola litoralis* ssp *litoralis* (Strapwort)**

As a British native, strapwort is now restricted to a single site – Slapton Ley, Devon – where it occurs on cattle-poached, seasonally inundated muddy shingle. Associated species include *Chenopodium rubrum*, *Persicaria hydropiper*, *P. maculosa*, *Poa annua*, *Potentilla anserina* and *Sisymbrium officinale*. Strapwort has been the subject of a species recovery programme (including introduction of plants propagated *ex situ*), following a period of marked decline associated with high summer water levels, lack of cattle trampling and possibly changes in water quality and salinity. Data from the recovery programme and from counts being done by the NNR management team may be sufficient for the assessment of direct attributes.

It is best to visit between late-July and mid-September when strapwort is flowering and water-levels are at their lowest. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area and length of shoreline) | Baseline survey needed to establish extent of suitable habitat. |
| Bare ground and sward height | Zone of muddy shingle with 20-75% bare ground and vegetation height < 5 cm | Visual assessment and measurement with ruler | *C. l.* is a low-growing annual of open muddy shingle, quickly eliminated if shoreline 'sward' becomes too tall or dense. |
| Hydrology | Signs of seasonal inundation (winter flood-lines, zone of damp mud normally inundated, etc.) | Visual assessment | *C. l.* known to benefit from low water-levels in summer, increasing the area of suitable habitat. |
| Disturbance | Signs of cattle trampling (poaching) present – hoof prints in wet mud, cow pats, etc. | Visual assessment | *C. l.* grows in areas subject to periodic (not year-round) trampling by cattle; lack of trampling known to have led to demise of some populations in the past. Need to ensure that cattle continue to have access to shoreline, but not so much poaching that shoreline is devoid of vegetation. |
| Negative indicators: encroachment | No encroachment of taller vegetation, e.g. tall herbs (*Urtica dioica*, *Eupatorium cannabinum*) or reed-swamp (*Phragmites australis*) | Visual assessment | *C. l.* cannot survive beneath canopy of tall-herbs or reed. If necessary intervene to control spread of taller species. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Cuscuta europaea*** **(Greater dodder)**

A rootless parasite of stinging nettles (*Urtica dioica*) and, rarely, hops (*Humulus lupulus*), and usually occurring in places where its main host is abundant. Usually associated with stream banks and riverside nettle beds, but in some areas also found on roadside hedges and ditch banks. This species is surprisingly scarce, considering how common its primary host is and the fact that – like its host – it favours damp, nutrient-enriched (nitrophilous) conditions. Representation of this species on SSSIs is unknown, but we suspect that many of its sites lie outside the protected sites network.

This species flowers in late summer (August-September) – but it should be possible to assess the extent and suitability of its nettle-bed, hedgerow or ditch bank habitats at other times of year, whenever its hosts are visible. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of area of suitable habitat<br>No loss in extent of area of nettles and hops<br>No loss in abundance of nettles and hops | Mapping (area)<br>DAFOR scale could be used | Baseline extent of suitable habitat may need to be determined by a specialist, and should be founded on an assessment of the distribution of both primary hosts and *C. e*. For this target to be met, repeat surveys should be able to show (1) no reduction in the overall area occupied by primary hosts, and (2) stinging nettles and/or hops still as abundant as during baseline survey. Watch out for stinging nettles being usurped by other equally competitive species (e.g. *Impatiens glandulifera*). There are many secondary hosts (at least 40 species), but these are probably not particularly useful when assessing the site. |
| Soils and hydrology | Dampness present at soil surface throughout winter<br>Nitrophilous conditions present – vegetation lush and nettles and hops dominant | Visual assessment | Requires damp, nutrient-enriched soils, intermittently flooded between autumn and spring (winter floods may aid seed dispersal). If soils become too dry or infertile this should quickly 'show' in the reduced lushness and abundance of the dominant species. |
| Negative indicators: physical damage | Absence of herbicide use | Visual assessment | There should be no evidence of herbicide spraying to control its primary hosts. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Cyperus longus*** **(Galingale)**

As a native, *Cyperus longus* is typically associated with wet pastures and marshes near the sea, including base-rich seepages and flushes on coastal cliffs. It can form large stands, eliminating many would-be competitors by virtue of its tall growth and vigorous rhizomes. In England it occurs as a native in Cornwall, Devon, Dorset, Hampshire and the Isle of Wight (and more doubtfully in a few other southern counties), and in Wales in Caernarvon, Merioneth and Pembrokeshire. It also occurs widely (and inland) as a presumed introduction in ditches and ponds, mainly in central and southern England; it is commonly available from garden centres and at many of its non-native sites it was undoubtedly originally planted. Assessments should only relate to those sites where the species is considered to be native.

The plant is readily spotted at most times of year, but it is probably best to assess the indirect attributes between April and October. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | No loss of extent of patches | Mapping and measurement | |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping | Baseline survey required to establish extent of suitable habitat and locations of existing *C. l.* patches. If in doubt, take baseline extent of *C. l.* as indicative of the extent of suitable habitat. Decline of this species nationally has mainly been due to gross destruction of habitat (agricultural improvement, drainage, building developments, etc.). |
| Hydrology | Evidence of water table and/or lateral water movement close to surface | Visual assessment | *C. l.* grows in areas with a high water table and lateral water movement close to the surface. On coastal sites it often occurs in flushes or seepages where water movement is easily |

| | | | |
|---|---|---|---|
| | | | discerned (look out for water debouching onto the shore). Water quality may also be an issue; certainly it favours base-enriched waters, but there is little known about its tolerance limits in terms of nutrient loadings, etc. One might suppose that eutrophication could be damaging, either directly or (more likely) through increased vigour of competitors. |
| Negative indicators: encroachment | No encroachment from adjoining vegetation | Mapping or measurement | It is known that some populations have been lost in the past due to encroachment of alder and willow. The account in *Scarce Plants* also suggests that in neglected, ungrazed habitats *C. l.* could be ousted by more competitive herbs (e.g. *Oenanthe crocata*). This may be true, but many strong populations are on ungrazed or lightly grazed sites (e.g. sea-cliff flushes), and it is unlikely that grazing (or any other disturbance) is necessary for their survival. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Gladiolus illyricus*** **(Wild gladiolus)**

This species typically occurs in bracken-infested acidic grassland; its position often appears to be 'ecotonal', and it is suggested that optimal conditions occur when shading from the bracken canopy in high summer varies spatially or from year to year between 'light' and 'heavy'. Essentially this is a plant that requires seasonal (summer) shading, as does, for example, *Hyacinthoides non-scripta* and *Anemone nemorosa*.

It is best to visit in July-August, when the plants are in flower, and when the extent and density of bracken canopy can be assessed. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of area of suitable habitat | Mapping (area) | Baseline extent of available habitat may need to be determined by a specialist. Important to maintain extensive areas of bracken and grass-heath within which suitable niches occur. *G. i.* occurs within stands of bracken which may fluctuate from year to year in terms of canopy density. |
| Vegetation structure | Mosaic of bracken and grass with bluebell (*Hyacinthoides non-scripta*) and wood anemone (*Anemone nemorosa*) present<br>No encroachment by *Calluna* or scrub | Visual assessment | Encroachment by *Calluna* or by scrub (e.g. *Ulex* species) may be damaging, reducing the area of available habitat; gorse, if needing to be removed, should be carefully cut out, not burnt. Note that scrub often occurs in vicinity, and is not of itself damaging, as long as it is not encroaching on the bracken-grass areas. |
| Negative indicators: physical damage | No part of mapped area should be burnt or cut | Visual assessment | Burning of heathland and eradication of bracken (e.g. by cutting or use of herbicides) is known to be damaging. Areas supporting *G. i.* populations may be grazed (or have grazing close by), but even quite heavy grazing is probably not damaging, since grazing pressure tends to decline in the spring as the bracken canopy becomes established. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Gnaphalium luteoalbum*** **(Jersey cudweed)**

A plant of seasonally flooded sand dune-slacks, artificially created ponds and sandpits; formerly also occurring in sandy fields and waste places. This is a short-lived species, sometimes behaving as a biennial, sometimes as an autumn-germinating annual (but then flowering the following autumn rather than in the spring), or else germinating in the spring. Populations fluctuate annually, depending on the availability of open ground for germination. Pools are seasonal and shallow, often drying up in late summer.

It is probably best to visit when the plant is flowering, in late summer (July-September), at the time when water levels are at their lowest, although most indirect attributes could be assessed at other times of year. Bare ground should be assessed at likely germination times (spring or autumn). Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey of known colonies and areas of additional suitable habitat should be carried out by a specialist. Autecology not well-understood, so precise delimitation of niche may be problematic. |
| Hydrology | Standing water present until late summer | Visual assessment | In its dune-slack habitat, flooding is a key factor in restricting competition from more vigorous species (including perennial graminoids) – a pattern of winter flooding followed by drying-out through the summer is ideal. |
| Bare ground | 50-70% bare ground present in either September or May | Visual assessment | Bare ground is essential for germination, which may be in autumn or spring-early summer depending on conditions. As a guide, bare ground should be assessed either in autumn (September) or late spring (May). |
| Vegetation structure and composition | Open vegetation, with robust graminoids or other 'coarse' vegetation absent or rare | Visual assessment<br>DAFOR scale could be used | Coarse vegetation can quickly lead to the demise of *G. l.* Associated species in the open sward can include *Agrostis stolonifera*, *Centaurium erythraea*, *Lotus corniculatus*, *Potentilla anserina*, *Prunella vulgaris*, along with annuals such as *Erophila verna* and *Linum catharticum*. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Hypericum linariifolium*** **(Toadflax-leaved St John's-wort)**

This species is restricted to Devon, Cornwall and S Lleyn in Caernarvonshire, where it is a short-lived perennial of anciently open U1-type vegetation on steep south-facing acidic rocky slopes. Sites are often surrounded by scrub or woodland. Typical associates include *Agrostis capillaris*, *Aira praecox*, *Digitalis purpurea*, *Sedum anglicum*, *Teucrium scorodonia* and *Umbilicus rupestris*. *Hypericum humifusum* is also an occasional associate, and hybridization between the two species is considered to be a potential threat at some sites (e.g. in the Channel Islands, where pure *H. linariifolium* is thought to no longer occur).

This species can be readily spotted when in flower (June-July), but can be overlooked or misidentified as *H. humifusum* at other times of year, indirect attributes may be assessed at any time of year. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey required to establish extent of suitable habitat. Recent baseline surveillance of most populations is already available *via* EN-funded surveys by Plantlife. |
| Bare ground | 10-50% bare ground (including bare rock) in suitable habitat | Visual assessment | Seedling establishment requires patches of bare soil. Drought is important in keeping sward sufficiently open-textured; occasional burning may also help to keep vegetation open, though repeated/frequent burning may be damaging. |
| Vegetation structure | Open unshaded vegetation<br>No encroachment of scrub or overhanging trees | Visual assessment | Open areas need to be permanent or semi-permanent (*H. l.* apparently has only a very limited and short-lived buried seed-bank), so if within a matrix of scrub/woodland then it is important that this is kept at bay. Drought, nutrient impoverishment and thin soils usually limit encroachment of taller vegetation, scrub and woodland, though spread of gorse (*Ulex europaeus*) known to be a threat at several sites, particularly as a fire hazard. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Hypochaeris maculata*** **(Spotted cat's ear)**

In Britain this long-lived perennial is found in three quite different habitats – grazed or ungrazed calcicolous grasslands (eastern England), maritime cliffs (Cornwall and N Wales) and wind-blown sand (Cornwall). However, in all these habitats the plant grows in lime- and/or magnesium-rich soils, derived from chalk, Jurassic or Carboniferous limestones or wind-blown shell-enriched sand. The biology and autecology of this species has been studied in great detail, but precise delimitation of its habitat requirements on particular sites can still be problematic.

It is best to visit when the plant is flowering in June-August. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | At least a minimum viable population size present AND<br><br>No year-on-year reduction in population size | Count of individuals | *H. m.* occurs on nine sites, three colonies in excess of 300 plants, six with tiny populations (three of them with fewer than 10 plants). Baseline surveys should include detailed mapping and counts or estimates of *H. m.* populations. Counts should be made at frequent intervals |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline mapping of suitable habitat. |
| Vegetation structure: sward height | 5-40 cm – target needs to be site-specific | Measure with ruler | Grassland may be grazed or ungrazed, but taller swards can become too rank and *H. m.* may cease to flower and eventually die. Grazing by sheep or cattle is probably beneficial. |
| Negative indicators: encroachment | No encroachment of scrub onto suitable habitat 'patches' | Visual assessment<br>Aerial photography | Lack of management can lead to scrub invasion, and this is known to have led to the demise of populations in the past. Open areas need to be permanent or semi-permanent. On larger sites the balance between scrub and open grassland could be monitored by means of aerial photographs. |
| Negative indicators: physical damage | Trampling-resistant indicator species (*Plantago major*, *Bellis perennis*) no more than occasional | Abundance of trampling-resistant species<br>DAFOR scale could be used | Plants may be destroyed as a result of heavy trampling by humans or cattle. Increasing abundance of trampling-resistant species (*Plantago major*, *Bellis perennis* and other rosette species) should be watched out for, along with any other evidence of increased trampling. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Juniperus communis*** **(Juniper)**

This shrub is found in a wide range of habitats – ssp *communis* occurs locally throughout Britain and Ireland on both calcareous and acidic soils, while ssp *alpina* (= ssp *nana*) is restricted to parts of northern and western regions (including NW England) on rocks, cliffs, screes and open moorland in the uplands. It is suspected that populations of *J. communis* are limited by grazing, with remnant stands now confined to sites beyond the reach of grazing animals. Thus management of grazing (and its reduction or removal in some areas) is likely to play an important role in the status of this species.

Sex ratio needs to be investigated in the spring (April), other attributes can be assessed at any time. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size: extent | At least a minimum viable population size present AND<br><br>No more than 10% loss in overall coverage of the population | Mapping and extent – metres | |
| Population size: number | No marked reduction in population level | Count of individuals | This provides a separate but complimentary check to the 'extent' attribute. Aim should be to maintain population at least above the lower 10% variation from the average, derived from average of counts of bushes in 20 years since site was notified (or shorter period depending on notification date). |
| Population structure | Old growth bushes (> 100 years old) no more than occasional<br>Building to mature bushes at least frequent<br>Pioneer phase bushes (< 5 cm | Record age structure of population | Regeneration of *J. c.* is a key issue, with many populations now consisting of mostly moribund bushes. Within populations on SSSIs there is a need to ensure a proportion of pioneer and 'building' stages. |

| | | | |
|---|---|---|---|
| | girth) at least occasional | | |
| Sex ratio | Neither sex should exceed ratio of 2:1 | Ratio of male to female bushes | This attribute needs to be assessed in April, when bushes can be readily sexed. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Vegetation structure | No more than 75% closed juniper scrub | Record proportion of scrub:field layer | Need to ensure some areas of open ground to provide germination and establishment sites for *J. c.* |
| Negative indicators: shading | Overtopping species no more than occasional within juniper stands | Record overtopping saplings of tree species | *J. c.* is sensitive to shading and will decline if succession allowed to proceed to woodland. Presence of overtopping *Taxus baccata*, *Fraxinus excelsior*, *Acer pseudoplatanus*, *Quercus* species, *Fagus sylvatica*, etc., should be taken as an important negative indicator. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Liparis loeselii*** **(Fen orchid) English sites only**

This species grows in base-rich, low fertility fens. There are very few sites, and eventually more suitable turbaries should be created so that the plant can recolonise or establish after introduction. A minimum of six colonies should be present in the Norfolk Broads of sufficient size to withstand stochastic events.

It is best to visit in June when the plant is flowering and hydrology can be assessed. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition. If the indirect attributes are favourable but the species cannot be found it must be referred to the Country Agency botanical specialists.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | Site-specific targets of 'x' individuals present, with 'y' individuals flowering | Count of individuals | Minimum viable populations must be maintained, with larger populations in stronghold sites. 'y' should be at least 10% of 'x'. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss in extent of suitable habitat | Mapping (area) | |
| Vegetation structure | Deep moss carpet covering suitable habitat area | Visual assessment | |
| Vegetation structure: associated species | At least some of: *Campylium protensum, Calliergon giganteum, Scorpidium scorpioides, Cinclidium stygium, Carex appropinquata, C. lasiocarpa, Schoenus nigricans* | Identify associated species | |
| Hydrology | Relatively high water levels at or near the surface throughout the year, with surface wetness present in summer | Visual assessment | |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Lotus angustissimus*** **(Slender bird'sfoot trefoil)**

***Lotus subbiflorus*** **(Hairy bird'sfoot trefoil)**

These annuals typically occur in patches of drought-prone, south-facing acidic grassland (U1f) on clifftops and scrubby banks near the sea, frequently concentrated along grass-scrub transitions and linear managed features like footpaths and trackways; also sometimes inland, in thin grassland, along sandy tracksides and in open (disturbed) areas around sand and gravel workings. These two bird'sfoot trefoils often grow together, in an annual-rich community with such species as *Agrostis capillaris*, *Crepis capillaris*, *Hypochaeris radicata*, *Ornithopus perpusillus*, *Plantago coronopus*, *Rumex acetosella*, *Sedum anglicum* and *Vulpia bromoides*. Populations can vary dramatically from year to year, and this should be taken into consideration when planning direct attributes and targets.

It is best to visit between April and early June (flowering) or end of July (fruiting), but in dry years plants soon shrivel up and become impossible to see; most indirect attributes can be assessed at any time. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat (though spatial arrangement of habitat 'patches' can change from year to year) | Mapping (area of suitable grassland, length of grass-scrub ecotone and managed path-sides and trackways) | Baseline survey required to establish (1) extent of suitable habitat and (2) locations of *L. s.* and *L. a.* Some colonies are in long-established habitats (e.g. open grassland around rock outcrops), but most move around between intermittently suitable habitat 'patches' (e.g. colonising early successional grassland – perhaps from buried seed – following burning of cliff *Ulex* scrub). |
| Bare ground and sward height | 5-30% bare ground and sward height < 10 cm within patches of | Visual assessment and measure with ruler | Bare ground needed for germination and seedling establishment; both species are unable to persist in taller |

| | | | |
|---|---|---|---|
| | suitable habitat | | grassland. Populations vary in size from year to year, appearing to do best in years following severe summer drought. NB: take weather patterns into account – in 'wet' years some habitat patches can look 'too rank', but usually open up again with the return of drier weather. |
| Negative indicators: encroachment | No scrub encroachment onto suitable habitat 'patches'<br>Light scrub or more extensive areas of dense scrub should cover no more than 60% of site | Visual assessment | Most populations are within grassland or grass-scrub areas that, in the absence of disturbance, would rapidly succeed to dense scrub; thus, periodic disturbance/management is normally needed to maintain the right habitat conditions. Both species require sheltered, unshaded conditions, and commonly occur in areas of light scrub, or on open ground within areas of denser scrub (usually *Ulex* species, but also *Rubus* and *Prunus spinosa*). Many colonies are in areas kept open as a result of management to control spread of scrub (e.g. cutting or burning). Scrub encroachment onto patches of suitable habitat is permissible only if off-set by creation of new scrub-free areas nearby. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Luronium natans*** **(Floating water-plantain)**

A small aquatic plant that can exist in a number of different growth forms, conferring on it a wide ecological amplitude. This spans habitats ranging from upland lakes, small fast flowing streams, deep sluggish rivers and their backwaters, to temporary pools, as well as various artificial habitats including canals, ditches, reservoirs, ponds and peat cuttings. A more detailed discussion of monitoring and surveillance of *Luronium* can be found in the LIFE in UK Rivers Project report, this includes detailed methodology and suggestions for setting site-specific targets.

It is best to visit in late June to mid September, when regeneration and associated vegetation can be assessed; sites in which the water bodies are temporary should be assessed in late May to mid June. Sites should not be assessed less than 24 hours after heavy rain. Consult sects. 5-7 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |
| **Additional discretionary attributes:** | | | |
| Population size | Two or more discrete populations present OR single large population stretching >100 m<br><br>Within occupied habitat areas >20 % cover provided by *L. n.* OR for canals and shallow ponds, >2/3 of site open water or wet mud (available habitat)<br><br>No decline >50 % in cover of *L. n.* within an occupied habitat area | Number of populations in site<br><br>Some habitat areas can be assessed visually, others will require point sampling using a grapnel<br><br>Comparison with previous data | Discrete populations of *L. n.* must be greater than 50 m apart. On sites which are too small to contain two distinct clusters sufficiently distant from each other to constitute separate populations (e.g. small heathland or floodplain pools) it is more appropriate to consider whether there are other small populations in the vicinity outside the site. Ideally, hydrological connectivity should be maintained or restored between populations. Many habitats where *L. n.* is present may be subject to periodic major disturbance events and these may be important in enabling populations to persist at a site. Thus, there may naturally be considerable fluctuations in population size at a given site between monitoring visits and so only major fluctuations should be noted. In sites subject to rapid successional changes (canals and shallow ponds) the target considers the amount of available habitat rather than the cover. |
| Successful regeneration | Plants of differing sizes present OR >50 % plants producing flowers or fruits | Visual assessment | Where populations reproduce principally, or exclusively, through vegetative means, evidence of regeneration may be difficult to observe. Perennial populations should exhibit a range of plant sizes as this implies that there are a range of different aged individuals. |

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|---|---|---|---|
| | | | Annual populations, such as those of shallow pools, should flower and set seed. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Water transparency | Bed clearly visible:<br>- rivers, heathland pools and canals up to 1.5 m<br>- lakes, secchi disk >5 m | Visual assessment or use of secchi disk | Elevated turbidity levels as a result of high boat traffic densities, high phytoplankton densities, or the presence of benthic-feeding fish will have adverse impacts on submerged plant communities. Although *Luronium* may occur in naturally dystrophic waters with humic staining, this may be exacerbated by acidification, reducing water clarity further. |
| Substrate | Sediments cohesive but not too coarse | Visual assessment during plant sampling | Fine unconsolidated sediments are an unsuitable rooting medium and plants may be subject to uprooting. Conversely, where sediment is too coarse and mineral there may be scouring and poor root anchorage. |
| Water quality | Use targets for appropriate habitat type | See guidance in other chapters | This attribute will not be appropriate for assessing heathland pools. *L. n.* populations are present across a wide range of habitats with a corresponding range of water chemistry. This suggests that *L. n.* does not have limited tolerances to most water chemistry parameters and links between presence/persistence and water quality are not yet understood. As such the water quality targets set out for freshwater habitats should be sufficient to protect populations from adverse impacts. |
| Hydrology | Use targets for appropriate habitat type | See guidance on water levels and flows in other chapters | |
| Negative indicators: competition | Taller species associated with *L. n.* patch no more than occasional<br><br>None of: *Crassula helmsii*, *Hydrocotyle ranunculoides*, *Myriophyllum aquaticum*, *Azolla filiculoides* present | Assessment of relative height of other species within vegetation sample<br><br>Identification of alien invasive species | *L.n.* is particularly sensitive to competition from other species. Whilst competitive interactions are very difficult to measure, a simple judgement on the height of associated vegetation can give an indication of the likelihood of competitive exclusion. Other introduced species may have effects on ecosystem functioning through the food web or *via* direct effects on the plant community, e.g. large waterfowl populations or non-native crayfish species. Excessive overhanging vegetation both results in shading of aquatic vegetation and large inputs of organic matter in the form of leaf litter. Further negative indicators which should cause concern if present are bottom-feeding fish in lakes and excessive boat traffic in canals. Explicit targets are not included, but these factors should be considered when reaching the overall assessment. |

## UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

### Interest feature: *Lythrum hyssopifolium* (Grass poly)

This is a rare spring-germinating annual of open, winter-wet ground that dries out to a greater or lesser extent in summer. Most of its sites are in hollows, ruts and low-lying depressions on arable land, where the crops have been killed-off by winter flooding. The largest populations, however, are at Slimbridge (Gloucs) where damp, winter-flooded ground is heavily trampled (and nutrient-enriched?) by waterfowl. At some sites the hollows supporting this species may remain damp in summer (when plants can be luxuriant), or they can dry out completely (when plants may be absent or small); thus, population size may fluctuate considerably from year to year. Associated species include *Juncus bufonius*, *Polygonum aviculare*, *Persicaria maculosa*, *Plantago major*, along with ephemeral bryophytes such as *Aphanorhagma patens* and *Riccia converrosa*.

On arable sites a summer visit can check for crop failure, whilst a winter visit will be useful to assess extent of flooding. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. There are good population baselines for several sites (see RDB account and *Watsonia* paper by Callaghan) – TPDB may hold more up-to-date population data. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area of hollow or lake margin) | Establishing a baseline of suitable habitat/niche may need to involve a specialist. On arable sites, niche availability can probably be best assessed in winter (extent of flooding). |
| Bare ground | Arable – bare ground at least 90% following crop failure in spring<br>Slimbridge – bare ground at least 75% in winter/early spring | Visual assessment | Bare ground is essential, on arable land provided by seasonally elevated water table. At Slimbridge in late spring and summer, sheer abundance of *L. h.* and associated annuals may lead to very low levels of bare ground. Open conditions are maintained by heavy grazing by waterfowl and periodic flooding in winter. |
| Hydrology | Suitable niche flooded in winter | Visual assessment | If lack of flooding is only during particularly dry winters then this is not significant (plant can re-colonise following the next wet winter from buried seed-bank); however, if hollows remain unflooded even in wet winters, this is indicative of unfavourable condition. |
| Negative indicators: encroachment | No evidence of incipient scrub encroachment by perennial species, particularly perennial *Juncus* and *Salix* species<br>At least three present from: *Juncus bufonius*, *Persicaria maculosa*, *Plantago major*, *Polygonum aviculare* | Visual assessment | In the absence of cultivation of arable fields perennial species such as *Juncus* and *Salix* will appear. The community should remain open, and with most/all of *Juncus bufonius*, *Persicaria maculosa*, *Plantago major*, *Polygonum aviculare* (and other low-growing spring annuals) conspicuously present. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Ophioglossum azoricum*** **(Small adder's tongue) English and Welsh sites only**

In England, this pteridophyte is restricted to the Isles of Scilly, Lundy, Somerset, the New Forest and Cumbria. It occurs in free-draining (but often flushed) maritime grassland and heath, in damp sandy depressions on coastal dunes and – in the New Forest – in open moist hollows within stands of *Calluna-Erica* heathland. Little is known of its ecological requirements, particularly of the gametophyte generation that is subterranean and mycorrhizal, and this lack of detailed knowledge makes it difficult to specify attributes for purposes of favourable condition assessment. In the Isles of Scilly it is found with *O. lusitanicum*.

Baseline survey should, if possible, be in spring-early summer when plants are visible (from mid-summer onwards they disappear to 'aestivate' as dormant root buds); indirect attributes can be assessed at any time of year. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey needed to establish (1) extent of suitable habitat and (2) locations and extent of *O. a.* colonies. Its habitat requirements are not well understood, so precise delimitation of 'available niche' during baseline survey may be problematic. |
| Vegetation structure: bare ground | Even, open-textured sward with 2-10% bare ground | Visual assessment | *O. a.* appears to prefer swards with small amounts of bare ground. |
| Vegetation structure: sward height | 1-2 (-5) cm | Measure with ruler | Light trampling (plus grazing) is probably beneficial. *O. a.* is a poor competitor, and does not usually survive in taller vegetation. Intervention may be necessary to ensure turf is kept tightly cropped. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Ophioglossum lusitanicum*** **(Least adder's tongue)**

This species is restricted to a single site – on St. Agnes, Isles of Scilly – where it occurs in open, tightly grazed acidic grassland/maritime heath, on thin peaty soils overlying granite. Associated species include *Aira praecox*, *Armeria maritima*, *Danthonia decumbens*, *Plantago Coronopus*, *P. lanceolata*, *Radiola linoides* and *Sedum anglicum*.

*O. lusitanicum* is visible between about October and March, though in a mild wet autumn fronds may show as early as late August; most indirect attributes can be assessed at any time. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. Rosemary Parslow, the BSBI v.c. recorder has a detailed surveillance record for this species, which is likely to be sufficient. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey needed to establish extent of suitable habitat. |
| Vegetation structure: sward height | Close-cropped (< 5 cm) open turf, with no signs of poaching or breaking up of turf | Measure with ruler | Light trampling (plus grazing) probably beneficial, but more intensive use by holiday-makers can result in localized erosion of the thin turf favoured by *O. l.* |
| Negative indicators: physical damage | No signs of burning | Visual assessment | Uncontrolled burning is a potential threat, especially so if fires penetrate the underlying peat. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Ornithopus pinnatus*** **(Orange bird's foot)**

In England orange bird's foot is restricted to the Isles of Scilly, where it occurs in dry heaths and acidic grassland on thin soils overlying granite, and in disturbed sandy areas (including bulb fields and gardens). Associated species include *Erica cinerea*, *Lotus corniculatus*, *L. subbiflorus*, *Ornithopus perpusillus*, *Plantago coronopus* and *Sedum anglicum*. Populations can vary in size (and 'visibility') from year to year.

It is best to visit between when *Ornithopus* is in flower (April-May); most indirect attributes can be assessed at any time. Monitoring could be usefully combined with *Viola kitaibeliana*. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. Rosemary Parslow, BSBI v.c. recorder has a detailed surveillance record for many extant sites, and will be an important source of information on direct attributes. All indirect attributes are mandatory except the last, which is mandatory on heathland sites. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey required to establish (1) extent of suitable habitat and (2) locations and extent of *O .p.* colonies. While some colonies are long-standing and 'reliable', many others appear only sporadically (from buried seed-bank) whenever habitat conditions are right. |
| Bare ground | Open turf with 20-75% bare ground in spring-early summer | Visual assessment | *O. p.* requires open, sparsely vegetated ground (often disturbed and trampled), often found within mosaic of otherwise unsuitable heath or grassland; also occurs in very open conditions on cultivated ground in gardens, and in bulb fields. A site-specific target will be required. |
| Negative indicators: shading | Unshaded conditions, without encroachment of taller/denser vegetation | Visual assessment | *O. p.* is a poor competitor, so can be lost from sites which become overgrown; abandonment of cultivation is a threat to some of its bulb field sites. Intervention may be necessary to limit encroachment of taller vegetation. |
| Negative indicators: physical damage | Burning never affecting > 20% of heathland area | Visual assessment | Heathland populations may be vulnerable to effects of uncontrolled burning; light burning is permissible, but evidence of extensive and/or frequent uncontrolled fires indicates unfavourable condition. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Physospermum cornubiense*** **(Bladderseed)**

This species is geographically highly restricted, formerly occurring in Devon (and – as a native? – in Buckinghamshire) but now confined to a small area in mid- and south-east Cornwall. Within this area it is found in a wide variety of habitats, including open woodland, scrub, rough grassland, damp heathland and roadside banks. Many old records were from woodland edges and clearings, but the largest surviving populations are now associated with heathland dominated by *Molinia caerulea*.

It is best to visit when the plant is in flower (late June – early September); most indirect attributes can be assessed at any time. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Originally a plant of open woodland and wood-edge habitats, but now associated with wide range of vegetation types. Baseline survey needed to establish (1) extent of suitable habitat and (2) locations and extent of *P. c.* colonies. Habitat requirements are not well understood, so precise delimitation of 'available niche' during baseline survey may be problematic. |
| Negative indicators: shading | No increase in area with heavy shade<br>> 50% no more than lightly shaded | Visual assessment | A habitat matrix with varying shade levels is likely to be present and should be maintained. Semi-shade is fine, but *P. c.* fails to flower in dense shade and is probably eventually eliminated. Keep record of proportion of site heavily shaded and ensure this is not increasing. |
| Negative indicators: encroachment | No encroachment by dense scrub and over-hanging trees into the open areas | Visual assessment | Lack of management may quickly allow succession to dense scrub or woodland. *P. c.* has a persistent rootstock enabling them to survive for several years even when apparently 'swamped' by overgrowth; however, long term survival likely to depend on keeping dense scrub and woodland at bay. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Potentilla fruticosa*** **(Shrubby cinquefoil)**

This species occurs in two rather different situations in the uplands of northern England – on shingle banks and along the margins of the River Tees, and in screes, on ledges and in crevices in the Lake District high fells. In the mountains of Cumbria it may be excessively restricted in its distribution as a result of very heavy grazing pressures – populations and plants are generally small but further threats (beyond the over-confinement to ledges resulting from the grazing pressure) appear minimal. In its river shingle and riverside localities it appears to be reliant on an active river, producing an open competition-free environment. Modifications to the natural dynamics of the river may have caused problems already and maintenance (or restoration) of the 'spatiness' of the river is important. Other threats in this habitat are likely to come from excessive levels of erosion due to high visitor numbers and possibly from grazing.

It should be possible to assess the indirect attributes at any time. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline extent of available niche may need to be determined by a specialist. In many instances the core area of suitable habitat will be determined by underlying geology and unlikely to change in any way that could be moderated by management. However some scree and river margin habitats may be subject to threat. In some instances (e.g. in the Lake District Fells) the niche should be interpreted generously as heavy grazing probably seriously restricts current *P. fruticosa* distribution. |
| Fluvial dynamics (where appropriate) | Natural dynamics of river maintained (including winter spates and shingle bank dynamics) | Visual assessment | Where *P. f.* occurs in river shingles the 'spatey' dynamics are believed to be important in maintaining an open habitat (free from development of woodland cover and providing opportunities for spread by layering). |
| Negative indicators: physical damage | Signs of physical damage as a result of management or access should be no more than rare | Visual assessment (signs of collection, burning, trampling, stock grazing etc.) | Although mature *P. f.* plants appear tolerant of some level of stock grazing (the species seems to be unpalatable) and may benefit from the reduction in competition, *P. f.* seems to be excessively restricted by high levels of grazing (seedlings may be more susceptible than mature plants). It is also vulnerable to burning and collection. Trampling of riverside sites by people may be seriously affecting some populations. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Rumex rupestris*** **(Shore dock)**

Typically associated with soft-rock clay (head) cliffs overlying rocky wave-cut platforms/raised beaches; also, more rarely, on hard rock cliffs and in moderately open (unshaded) damp dune slacks. Plant moves to occupy suitable habitat on shoreline subject to patchy/localized erosion and some accretion.

It is best to visit between July and September; most indirect attributes can be assessed at any time. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Disturbance | Natural erosion of cliffs desirable – coastline should not be over-stabilised, nor over-eroded | Visual assessment | No anthropogenic change by sea defence work, development etc. |
| Hydrology | Requires lateral water movement<br>No culverting of streams<br>Continual presence of freshwater | Visual assessment | |
| Water quality | No excessive algal growth<br>No sewage outfall | Visual assessment | |
| Vegetation structure | Requires open vegetation<br>No taller species (e.g. *Phragmites*) or scrub | Visual assessment | |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

## Interest feature: *Saxifraga hirculus* (Yellow marsh saxifrage)

This plant grows in brown moss flushes in upland grassland, along seepage lines where base-rich water emerges, and at lower altitudes in wet rough grassland in Scotland. Highly restricted to a narrow zone around flush margins and along rills. Clonal growth can result in large numbers of ramets. Genets are very difficult to distinguish without uprooting. Flowering seems to be rare, certainly when swards are grazed.

It is best to visit between June and the first frost. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable (also see above). Population fitness is best estimated by counts of ramets along with an assessment of flowering/fruiting success. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline extent of available habitat may need to be determined by a specialist. |
| Vegetation structure | Open calcareous flushes and rills present<br>Grassland or grass/heath no more than moderately grazed | Visual assessment | Heavy grazing can be tolerated for short periods but lack of flowering and physical damage to vegetation by livestock may lead to population and/or genetic attrition. Grazing pressure should be sufficiently light (or seasonally adjusted) to allow flower production and seed output. |
| Vegetation structure: sward height | 5-25 cm | Measure with ruler | Grazing down to 5 cm will be tolerated by vegetative plants but loss of all flowers is likely. Swards above c. 25 cm may eventually result in population declines through competition. |
| Hydrology | No modification to natural hydrological pattern<br>No evidence of eutrophication | Visual assessment | Hydrological and chemical composition of the local environment appear critical and all modifications (e.g. drainage, nutrient input) should be avoided. |
| Negative indicators: shading | Trees and shrubs should be absent | Visual assessment | *S. h.* requires open, unshaded conditions. |

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**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Schoenoplectus triqueter*** **(Triangular club-rush)**

This clump-forming species grows to seaward of fringing reed-beds on estuarine mud-banks exposed at low tide. It is tolerant of brackish conditions, but is not found with any true halophytes. It once occurred on the lower reaches of several rivers in south-east England, but now is confined to the River Tamar. Reasons for its decline are unclear, although it is thought that land-claim, river engineering, and changes in seciment deposition and amounts of boat traffic could be at least partly responsible. It is known to hybridise with *Schoenoplectus tabernaemontani* (*S.* x *kuekenthalianus*) and *S. lacustris* (*S.* x *carinata*), and most recent reports of the species have turned out to be hybrids. The last surviving clump of non-hybrid *S. triqueter* is on the Tamar Estuary (where several clumps of *S.* x *kuekenthalianus* also occur) – it is now popularly regarded as Britain's rarest native vascular plant.

The time of visit is dependent on tides – it should only be assessed (from a boat, take binoculars) when the plant is visible above water level. All attributes are mandatory. If one attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Clump should still be extant | Map single unhybridised clump | There is only the one extant British station (R. Tamar); formerly known from the Thames, Medway and Arun, but recent surveys have failed to find anything other than one or other of the hybrids. Assessments should be regularly augmented by detailed survey by a specialist to check on health of remaining clump (and hybrids) and to assess the success (or otherwise) of any attempts to bolster the population with re-introductions from cultivated stock. |
| Hybridization | No loss of 'pure' *S. t.* | Genetics work and identification | Evidence of hybridisation with *S. tabernaemontani* and rarely *S. lacustris*; on all former sites, we suggest the hybrid populations should be kept under surveillance by specialists. There may be attempts in future to reintroduce 'pure' *S. t.* onto one or more of these sites. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Negative indicators: competition | Needs lack of competition from adjoining reed-swamp vegetation | Visual assessment | *S. t.* grows along the outermost edge of reed-beds fringing estuaries and the lower (somewhat brackish) reaches of rivers. There should be no evidence of any succession – use aerial photographs to check on the stability of the reed-swamp edge. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Scirpoides holoschoenus*** **(Round-headed club-rush)**

In England, native populations of this tall, densely tufted rhizomatous perennial are restricted to just two sites, one in each of Devon (Braunton Burrows) and Somerset (Berrow Dunes). At Braunton Burrows it occurs in damp dune-slacks and on drier ground on very low stabilized dune hummocks, usually on open ground but with dune scrub never far away. At Berrow, a single tiny patch of *Scirpoides* occurs in a rather overgrown damp sandy hollow on a coastal golf course. It also occurs sporadically as an introduction on waste ground near the sea.

It is best to visit when the plant is flowering/fruiting (August-October), though indirect attributes can be assessed at any time of year. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable. There is a fairly detailed surveillance baseline for Braunton Burrows, while the Berrow 'clump' is being routinely monitored by Somerset Rare Plants Group. All indirect attributes are mandatory. If one attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | |
| Hydrology | Presence of any from: *Anagallis tenella*, *Mentha aquatica*, *Pulicaria dysenterica*, *Salix repens*, *Carex disticha*, *Hydrocotyle vulgaris*, *Potentilla anserina* | Visual assessment and presence of indicator species | The danger here is that slacks will become too dry (too wet is unlikely to be a problem on its existing sites). Required dampness can be inferred from the vegetation (associated 'wet ground' species at Braunton Burrows include *Anagallis tenella*, *Mentha aquatica*, *Pulicaria dysenterica* and *Salix repens*; at Berrow they include *Carex disticha*, *Hydrocotyle vulgaris* and *Potentilla anserina*). |
| Vegetation structure | Dune slacks with open vegetation with < 30 cm sward height<br>Light scrub on drier ground | Measure with ruler | *S. h.* often easily visible as a tall-growing (c. 1 m) plant within a sward that is otherwise generally < 30 cm tall (sometimes also with *Juncus acutus*); on adjoining drier ground *S. h.* can persist along the margins of taller vegetation, including transitions to dune scrub. |
| Negative indicators: encroachment | No scrub encroachment into open dune slacks | Visual assessment | *S. h.* can persist within, or along the margins of low dune scrub; but scrub encroachment represents a significant threat at Braunton Burrows, where the effects of a declining rabbit population (and falling water table?) has been off-set to some extent by annual mowing in winter to keep scrub at bay. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Senecio paludosus*** **(Fen ragwort)**

In England this long-lived perennial is currently restricted as a native species to a single roadside ditch near Ely, Cambridgeshire. The ditch is usually flooded in winter and dries out in summer, and apart from *S. paludosus* is otherwise unremarkable – the list of associated species includes *Arrhenatherum elatius*, *Calystegia sepium* and *Elytrigia repens*. Seed-set at the native site is poor, while plants of introduced *S. paludosus* at Wicken and Woodwalton Fens have been found to produce moderate quantities of seed, which suggests that habitat conditions at the native site may not be ideal. Assessing whether these and other introduction sites are in favourable condition should include counts of numbers of plants, and some measure of seed production and recruitment of new plants. However, the appearance of seedlings may naturally be an infrequent event (even within populations on mainland Europe) and so should not be taken automatically as a sign of unfavourable condition. Much of the necessary monitoring has already been instigated through English Nature's Species Recovery Programme, and it is important to ensure that this work continues.

Different attributes will need to be assessed at different times of year – the plant is in flower and/or setting seed in July-August, evidence of seedling establishment may require a visit in spring (April), evidence of flooding will need to be assessed in the winter. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, spatial targets may be advisable (also see above). All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Hydrology | Ditch should be wet in winter | Visual assessment | Ditch needs to be wet in winter, to encourage seed germination and to help limit growth of potential competitors. |
| Negative indicators: encroachment | No encroachment of dense competing vegetation | Visual assessment | While *S. p.* can thrive in quite tall and rank vegetation, a careful watch should be maintained to ensure that the vegetation is not becoming too rank (including tree or shrub encroachment). |
| Negative indicators: pollution | No evidence of pollution other than eutrophication | Visual assessment | Water quality is likely to be rather poor (polluted and nutrient-enriched) due to the close proximity of road and arable. This is probably acceptable, but there should be no other forms of pollution on the site (e.g. rubbish tipping). |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Silene nutans*** **(Nottingham catchfly)**

This long-lived perennial occurs in calcicolous grasslands on chalk and limestone, especially on thin soils and around rock outcrops where there is plenty of open ground and little competition from other species. It is not a strict calcicole, however, being also found in sourthern England on acidic substrates on coastal cliffs, sandy banks and stabilized shingle. The largest English populations are on shingle.

It is best to visit when the plant is flowering (May-July). Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey needed to establish (1) extent of suitable habitat and (2) locations and extent of *S. n.* colonies. |
| Bare ground and sward height | 5-20% bare ground and sward height generally < 20 cm within patches of suitable habitat | Visual assessment and measure with ruler | Able to persist in taller grassland, but usually associated with fairly short swards with little competition from other species. |
| Negative indicators: encroachment | No encroachment of coarse grassland or scrub onto pockets of suitable habitat | Mapping and visual assessment | Lack of or insufficient grazing may lead to *S. n.* being out-competed by other species. This may be most easily monitored by repeat-mapping of distribution and extent of scrub. |

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**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Sorbus arranensis*** **(Arran whitebeam)**

Limited to a few ravines and rocky streambanks with scattered woodland cover. This species will be in favourable condition when new young trees are evident, and the old trees remain a source of seeds.

It is best to visit from May to October. All attributes are mandatory. If one attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Hybridization | At least 25% of the current population to be positively identified as this species | Identification | Counting of the individual trees is difficult owing to the steep and crumbling nature of the terrain in the main area. It is also not easy to get a good view through binoculars owing to other trees growing in association, and the difficulty of distinguishing between *S. arranensis* and *S. pseudofennica*, which also grows in the ravine. The help of a competent field botanist is essential. |
| Successful regeneration | Presence of young trees and production of mature fruit | Observation of the population to determine the continued existence of seed source and saplings | This may have to be done through binoculars for the majority of the site but some of the individual trees are accessible in order to check the presence of fruit. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Negative indicators: physical damage | No visible damage to existing trees, and some establishment of saplings | Visual assessment - through binoculars | Most of the existing, old specimens grow in a steep-sided ravine, which is not easily accessible to humans. Deer and sheep are more agile and can reach some of the trees. Part of the population has a deer fence around it, but this is in need of repair. Other, smaller, populations could be protected by fencing, and plants could be grown on from seed and re-instated in the wild. |

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**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Sorbus pseudofennica*** **(Arran service-tree)**

Limited to a few ravines and rocky streambanks with scattered woodland cover. The continued survival of the existing trees, but more importantly, the establishment of new saplings, is crucial to determining favourable conservation status.

It is best to visit from May to October. All attributes are mandatory. If one attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Hybridization | At least 25% of the current population to be positively identified as this species | Identification | Counting of the individual trees is difficult owing to the nature of the terrain. It is also difficult to obtain a clear view of individuals as other trees grow nearby, including the very similar *S. arranensis*. The help of a competent field botanist is essential. |
| Successful regeneration | Presence of young trees and production of mature fruit | Observation of the population to determine the continued existence of seed source and saplings | This may have to be done through binoculars for the majority of sites but some individual trees are accessible in order to check the presence of fruit. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Negative indicators: physical damage | No visible damage to existing trees, and some establishment of saplings | Visual assessment - through binoculars | Most of the existing, old specimens grow in a steep-sided ravine, which is not easily accessible to humans. Deer and sheep are more agile and can reach some of the trees. Part of the population has a deer fence around it, but this is in need of repair. Other, smaller, populations could be protected by fencing, and plants could be grown on from seed and re-instated in the wild. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Spiranthes romanzoffiana*** **(Irish lady's-tresses)**

This late-summer flowering orchid seems to require two key environmental factors – (1) long-term hydrological stability (usually with some seasonal variation, including winter inundation, although this is not essential as long as winter-wet/summer-damp conditions can be provided), and (2) some kind of winter disturbance. The latter requirement is usually provided by winter grazing and trampling by cattle, which appears to stimulate growth of the subterranean over-wintering bud. The species is, however, readily consumed by stock during the summer and early autumn months and cattle grazing should be much reduced or absent during this period.

The species is at its most visible in the late summer-early autumn; indirect attributes are best assessed at different times of year. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | The core area of niche is determined by underlying hydrology and would be unlikely to change in any significant way without modification to the drainage pattern or water table. However, the full extent of available niche will only be realised if winter grazing produces adequate disturbance. |
| Disturbance | Signs of physical damage in winter (usually as a result of trampling by stock) should be obvious | Visual assessment | Although *S. r.* appears tolerant of some level of vegetation closure during the summer and early autumn months, it nevertheless requires the removal of competition and ground disturbance produced (usually) by cattle grazing during the late autumn or winter months. It may also be vulnerable to burning and collection. |
| Hydrology | Dampness at the soil surface (or at least in the top 5 cm – use a trowel to pull back a small sample of soil if necessary) at all times | Visual assessment | Maintain the naturally occurring water table of the habitat (usually quite high, even in summer). Although exact requirements are unclear, *S. r.* appears to have quite narrow tolerances with respect to long-term fluctuations in the water table. An observer should be able to detect signs of long-term |

| | | | |
|---|---|---|---|
| | | | change in water levels either by physical signs of summer drought or by the invasion of weedy or more drought tolerant vegetation. |
| Negative indicators: physical damage | Signs of physical damage in the summer should be no more than occasional | Visual assessment | *S. r.* is tolerant of low levels of background herbivore activity but should not be subjected to more than light grazing pressure and minimal levels of ground disturbance during summer – early autumn. Plants are sometimes subject to collection by people and signs of picking or digging should cause concern. |
| Negative indicators: shading | No shrub or tree cover | Visual assessment | This is a species of open wet grassland, flushes and bogs and is intolerant of shade. If shrubs and trees are present in vicinity of mapped area of 'suitable habitat', they should not be allowed to encroach onto that area. |

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**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Trichomanes speciosum*** **(Killarney fern)**

The gametophyte of this species is reasonably widespread across the British Isles, occurring in very sheltered, frost-free, dark, humid crevices in acidic rocks. The sporophyte demands sites that can remain at least as humid and frost free as the gametophyte sites whilst admitting somewhat more light. *Trichomanes* sporophytes are largely confined, therefore, to rock crevices and cave entrances, boulder-strewn areas within woodland and, in very mild situations, to rocks and trees in humid wooded valleys that provide the necessary protection from frost and desiccation. The following notes are written primarily with the requirements of the more restricted sporophyte in mind. This is one of the few vascular plant species which remains vulnerable to collection.

Visits can be made at any time of year, although winter visits may give better access to plant localities under certain situations. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline surveys will be required to indicate the extent of suitable habitat. Suitable habitat will have the following attributes: natural base-poor rock exposures, crevices, boulder fields or, occasionally tree boles providing humid frost free conditions with no incident sunlight falling directly onto the plants. |
| Physical structure: shelter and shading | Protected, frost-free and heavily shaded conditions (0% direct sunlight) | Visual assessment | *T. s.* requires humid, frost-free conditions with no directly incident sunlight. |
| Negative indicators: physical damage | Signs of physical damage in summer should be no more than rare | Visual assessment (signs of collecting by humans) | Plants are sometimes subject to collection by people and signs of picking should cause concern. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Vicia lutea*** **(Yellow-vetch)**

This species occurs principally in coastal habitats, including stabilized shingle, *Festuca rubra* cliff-top grassland and the ecotone between maritime grassland and blackthorn (*Prunus spinosa*) scrub. As an autumn-germinating annual, patches of open ground during late summer – early winter are required to aid its establishment, and thus some form of disturbance is desirable. It occurs as a casual in disturbed inland localities. In Sussex yellow-vetch occurs in chalk grassland although there is some doubt as to whether it is truly native there.

Yellow-vetch flowers in June, indirect attributes may be assessed in August-November. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| Direct attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| Indirect attributes | Targets | Method of assessment | Comments |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey needed to establish (1) extent of suitable habitat and (2) locations and extent of *V. l.* colonies. *V. l.* is most typically associated with stabilized shingle and grass-scrub ecotones on clifftops. Its habitat requirements are not well understood, so precise delimitation of 'available niche' during baseline survey may be problematic. |
| Bare ground | 5-20% bare ground in grassland (may be < 5% in summer but, if so, then plenty of annuals present); on shingle, vegetation cover other than *V. l.* should amount to no more than 40% | Visual assessment | An open-textured sward is ideal, with numerous small gaps, at least in the autumn, for regeneration. In summer, amounts of bare ground can be considerably reduced by extensive cover of annuals. [Note: vegetation height is not a particularly good predictor of suitable habitat, though usually it occurs in moderately short (5-20 cm) swards.] |
| Disturbance | Signs of burning over < 50% of site | Visual assessment | Occasional burning of gorse and blackthorn scrub is probably beneficial, with *V. l.* sometimes able to exploit early successional (open grassland) stages prior to re-establishment of scrub; however, more extensive and frequent fires may be detrimental. |
| Negative indicators: scrub | Light scrub or pockets of dense scrub to cover no more than 40% of site | Visual assessment | Scattered scrub is tolerated, while clearance of dense scrub can lead to reappearance of *V. l.* from buried seed-bank; the aim should be to have plenty of grassland and grass-scrub transition. |

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature:** ***Viola kitaibeliana*** **(Dwarf pansy)**

In England this species is restricted to the Isles of Scilly, where it occurs in short, open turf on sandy soils, and on open ground within eroding sand-dunes, around rabbit burrows and on cultivated land. Dwarf pansy is only easily visible for 2-3 months each year, and populations can vary dramatically from year to year.

It is best to visit, if possible, when *Viola* is flowering (March-April) or fruiting (May), but it should be possible to assess indirect attributes at most times of year. Consult sects. 5-7 and Appendix 6 before making a final selection of appropriate direct attributes for the site, the only mandatory direct attribute is to assess the presence of the species. All indirect attributes are mandatory. If any indirect attribute fails, the feature is not in a favourable condition.

| **Direct attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of species | If all other targets are met but the species cannot be found then the feature should be referred to the Country Agency botanical specialists. |

| **Indirect attributes** | **Targets** | **Method of assessment** | **Comments** |
|---|---|---|---|
| Niche availability | Sufficient area of suitable habitat to maintain population<br><br>No loss of extent of suitable habitat | Mapping (area) | Baseline survey needed to establish (1) extent of suitable habitat and (2) locations and extent of *V. k.* colonies. |
| Bare ground | Patches of open ground with 25-90% bare sand | Visual assessment | *V. k.* requires open ground, though often within a matrix of denser vegetation; also, sometimes on cultivated land. |
| Negative indicators: shading | No shading present<br>No encroachment of adjoining dune vegetation (e.g. marram) and no overgrowth of scrub | Visual assessment | *V. k.* is restricted to open, drought-prone areas subject to high levels of insolation; can occur with few, if any, associated species, but often co-habits with range of annuals or pauciennials (e.g. *Plantago coronopus*, *Anagallis arvensis*, *Cerastium diffusum*, *Erodium maritimum*, *E. cicutarium*, *Myosotis ramosissima*, *Senecio jacobaea*). |
| Negative indicators: physical damage | No direct physical damage to patches of suitable habitat – no digging of sand or erection of coastal defences | Visual assessment | Some erosion may be beneficial (e.g. rabbit burrows) to help maintain open conditions, but large-scale disturbance is likely to be detrimental; several *V. k.* populations known to have been lost following construction of coastal defences. |

**Appendix 6. Table of direct attributes and targets for species monitored using habitat guidance**

**UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES**

**Interest feature: Vascular plant species monitored using habitat guidance**

Assessment of indirect attributes should be undertaken according to the appropriate habitat guidance from other chapters of this manual. The key time for visiting the species in flower for assessment of direct attributes will depend on the species present. If in doubt consult a specialist. The mandatory direct measure is to assess the presence of the species. Further direct measures described below may be used in a discretionary manner to increase confidence in population viability.

| Direct attributes | Possible targets | Method of assessment | Comments |
|---|---|---|---|
| Presence/absence | Species should be present | Identification of the species | |
| **Additional discretionary attributes:** | | | |
| Population size | Presence of species in a defined number of subpopulations or site sectors (spatial target)<br>At least a minimum viable population size present<br>No loss in population extent > 10%<br>No decline in the population size category | Mapping<br>Count of functional individuals | Many annual species undergo significant population fluctuations, and population size estimates may not be helpful in assessing condition. Unless there are fewer than 100 individuals (when an individual count is generally possible) on the site, counts of functional individuals should be made or assessed in the categories (101-300; 301-1 000; 1 001-3 000; 3 001-10 000; more than 10 000). Population extent is useful when it is difficult to define functional individuals. |
| Successful regeneration | Presence of range of young and old plants<br>At least a minimum number/proportion of young plants or seedlings or full seed heads or flowers | Identification of the species<br>Count of individuals | This is important for understanding the viability of a population, but may be difficult to assess for some species. See sect. 5.8 for details. |

## Appendix 7. Examples of individually-notified species interest features

### 1. *Filago pyramidata* – Buckland Warren

Citation reads: 'The site supports a community of annual plants including one of the few remaining populations of the nationally rare broad-leaved cudweed *Filago pyramidata*. This species has declined drastically in recent decades and is currently known from less than ten sites in Britain and, as a consequence, is listed in the British Red Data Book of Vascular Plants'

No further indications are given regarding the size of the population in the citation, although the supporting documentation should be consulted, and may contain this information. Annual species frequently have large fluctuations in population size, and so absolute counts are unlikely to be useful in assessing condition.

Consulting the tables in Appendix 2, we find that *Filago pyramidata* is now included in Schedule 8, and should be monitored in England. Its principal habitat is that of suite 5, although it can also occur in the habitats of suites 7 and 8. Suite 5 includes 'species of disturbed/heavily managed grasslands, crumbly turf, path edges, etc. including CG7, U1, SD, OV', but it is clear from the citation that this is an area of cultivated land with rare arable weeds. Therefore, suite 8 'arable plants' is more suitable for assessing this site.

| **Direct attributes** | **Targets** |
|---|---|
| Presence/absence | No more than 50% loss in area covered |
| Successful regeneration | At least 10 individuals producing mature seed |

| **Indirect attributes** | **Targets** |
|---|---|
| Vegetation structure | >80 % open ground |
| Cultivation | The whole of the area should have been cultivated |
| Nutrient status | Negative indicators such as nettles, cleavers, docks and chickweed no more than rare |

Niche availability has not been included as an attribute since this entire site consists of a field margin, and hence could be considered as 'available niche'. The site is linear, and hence the structured walk should be straight, with assessment points evenly spaced along its length. The vegetation structure, cultivation and nutrient status should be assessed at each point.

*Filago pyramidata* is included in Plantlife's 'Bank from the Brink' project, and is also a UKBAP priority species for which Plantlife is the lead partner. Therefore it may be possible to collect information on the direct attributes by contacting Plantlife. Spatial targets have not been considered for the presence/absence attribute since the site is so small. If an entire field had been designated, then it could have been possible to use spatial targets to indicate how many margins should contain the species.

**2. *Carex filiformis* – Westwell Gorse**

Citation reads: 'The grassland of Westwell Gorse now supports one of the largest populations of the nationally rare downy-fruited sedge *Carex tomentosa*. … The downy-fruited sedge grows in this herb-rich grassland and is present at an unusually high density; the population is estimated to be over 4,000 plants. Nationally the species is known from only 13 locations, most centred on the Cotswold area of Wiltshire, Gloucestershire and Oxfordshire. As a consequence of the loss of herb-rich limestone grassland, downy-fruited sedge has declined nationally and is listed as rare in the British Red Data Book of Vascular Plants.'

Consulting the tables in Appendix 2, we find that *Carex tomentosa* is not included. However, the table in Appendix 1 shows that this is due to a change in taxonomy, and that it is entered as *Carex filiformis*. This appears in the current Red Data Book and should be monitored in England. There is an 'H' in the habitat column, and hence the appropriate indirect attributes will appear in one of the habitat guidance chapters.

The site is relatively small, and not readily divided into sectors. *Carex tomentosa* is a rhizomatous species, and hence distinguishing individual plants is difficult.

| **Direct attributes** | **Targets** |
|---|---|
| Population size | Area covered by population should not decrease by more than 10 % |
| Regeneration potential | Number of flowering/fruiting spikes should remain in the range 1000-10000 |

This species is surveyed regularly by the Ashmolean Natural History Society Rare Plants Group at this site, and it is unlikely that further measures of direct attributes will be necessary. They will also possess up-to-date data which might better inform the setting of appropriate targets. Westwell Gorse is a local nature reserve managed by the local wildlife trust (BBOWT), and they may also possess relevant data.

## Appendix 8. Example of scored combination interest feature – Lytham St. Anne's Dunes

Citation reads: 'a rich and varied dune flora typical of southern and western Britain with over 230 species of higher plants, some of which are scarce nationally or uncommon locally occurring on the northern and southern limits of their distribution range'

Using the citation *only* for the list of notable species, then the combination is:

| **Species** | **Score** | **Habitat** |
|---|---|---|
| *Vulpia fasciculata* | 50 | H |
| *Epipactis leptochila* | 50 | H |
| *Epipactis phyllanthes* | 50 | H |
| *Coincya monensis* ssp *monensis* | 100 | H |
| *Centaurium littorale* | 50 | H |
| *Pyrola rotundifolia* ssp *maritima* | 50 | H |
| *Equisetum variegatum* | 50 | H |
| **Total** | **400** | |

This list excludes *Euphorbia paralias* which is mentioned in the citation as being nationally scarce, but is no longer classified as such. This exclusion does not cause the total score to fall below 200, and hence is not a problem. There have been three changes in taxonomy which are listed in Appendix 1: *Vulpia membranacea* has become *Vulpia fasciculata*, *Epipactis dunensis* is now included within *Epipactis leptochila*, and *Rhynchosinapis monensis* is now *Coincya monensis* ssp *monensis*. There are a considerable number of species mentioned in the citation as being locally rare or uncommon, but which are not allocated a score; these should be monitored as a local distinctiveness attribute for the habitat.

All of the species in the combination have indirect attributes taken from habitat guidance appearing in another chapter. All of the species are associated with sand dune vegetation. This habitat will already be being monitored on this site, as it clearly constitutes a notified feature: 'important as the best example of a calcareous dune system remaining in Lancashire'. Therefore the habitat will not need to be separately monitored for the assessment of the scored combination. Access to the documentation assessing the habitat on the site will be required to make the final assessment for the combination.

Direct attributes need to be monitored for all of the species in the combination. This is a complex site consisting of dunes and slacks of varying characters. It is ideally suited to the use of spatial targets. Local information will have to be used to set appropriate targets.

| **Direct attributes** | **Targets** |
|---|---|
| Presence/absence | Species should be present |
| Population size/regeneration potential | Populations should be at least a minimum viable size. Most species can be counted in flower to give a measure of regeneration potential. *Equisetum variegatum* may be counted in cone, or the population extent measured. |

The measurement of population size/regeneration potential is a discretionary attribute, but may provide useful additional information to reach a judgement on population viability.

For the scored combination to be judged in favourable condition, the habitat must have been assessed as favourable, and all of the direct attributes should also be favourable. The site, though complex, is only of a medium size, and it should be possible to investigate all of the dune slacks. Apart from *Equisetum variegatum* and *Vulpia fasciculata*, all of the species are fairly conspicuous when in flower.