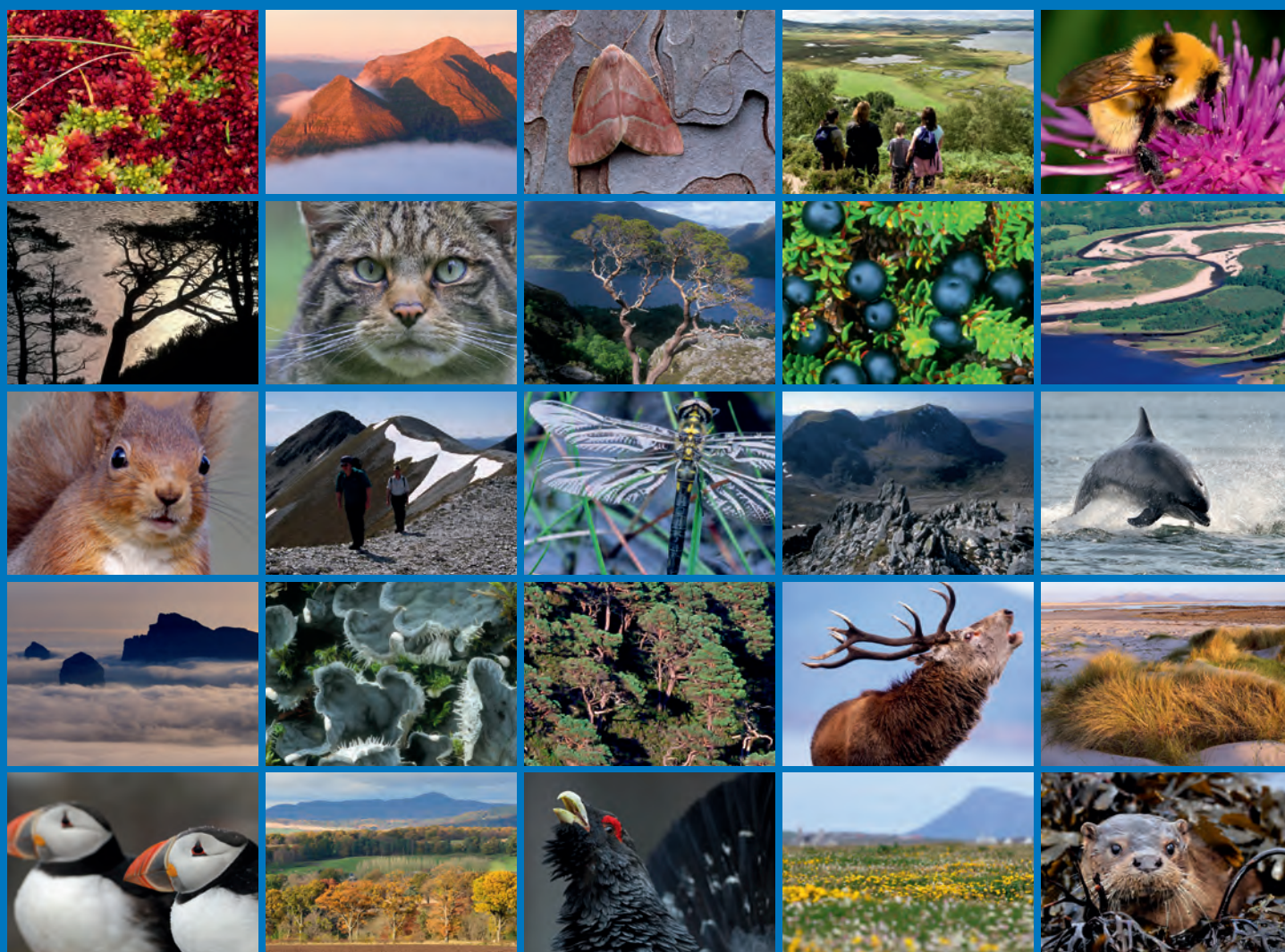


# The extent and condition of non-designated species-rich lowland grasslands in Scotland





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# COMMISSIONED REPORT

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**Commissioned Report No. 571**

## **The extent and condition of non-designated species-rich lowland grasslands in Scotland**

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## COMMISSIONED REPORT

# Summary

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### The extent and condition of non-designated species-rich lowland grasslands in Scotland

**Commissioned Report No. 571**

**Project No. 6186**

**Contractor: URS (Scott Wilson when initially contracted)**

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#### **Keywords**

Grassland; lowland; Annex I; BAP; loss; condition.

#### **Background**

A sample of sites (excluding grassland SSSIs) containing

- lowland grassland habitats listed in Annex I of the Habitats Directive and
- lowland grassland Biodiversity Action Plan (BAP) Priority habitats

was selected from the SNH Lowland Grassland Database. All sites had originally been surveyed between 1983 and 2001. They were revisited in 2010 and 2011 and their NVC communities were mapped. Their condition was assessed using a modified form of SNH's Lowland Grassland methodology for Site Condition Monitoring. 16% of the BAP Priority grasslands had been lost since 1983 and only 41% were in favourable condition. These figures are taken to be representative of the status of species-rich lowland grasslands (other than on SSSIs) in the Scottish countryside.

#### **Main findings**

Changes to extent

- 227 sites were surveyed across 13 local authority regions, amounting to 38% of all recorded sites with the above BAP and Annex I habitats. 27% by area was BAP Priority lowland grassland habitat and less than 6% by area was Annex I lowland grassland. The rest was largely species-poor improved or semi-improved grassland.
- It is estimated that 16% of the BAP Priority lowland grassland habitat present in 1983 was lost by 2011, equating to an overall rate of change of -0.7% per year. This loss was primarily of NVC communities MG5, U4 and M25.
- The most extensive BAP Priority habitats by far were Lowland Dry Acid Grassland and Purple Moor-grass & Rush Pastures representing 52% and 32% respectively of the surveyed NVC area. 11% was Lowland Meadow, 5% was Lowland Calcareous Grassland and only about 0.5% was Upland Hay Meadow.
- The most extensive Annex I grasslands were H6210 (Semi-natural dry grasslands and scrubland facies on calcareous substrates) and H6230 (Species-rich *Nardus* grassland on siliceous substrates in mountain areas), occupying 31% and 50% respectively of the surveyed Annex I grassland area. Annex I H6210 was all in south-east Scotland and

mostly in the Borders. 11% was H6520 (Mountain hay meadows, equivalent to Upland Hay Meadow Priority BAP habitat) and 9% was H6410 (Molinia meadows on calcareous, peaty or clayey-silt-laden soils) which were western and northern in distribution.

- Net loss of BAP Priority habitats was greatest for Lowland Meadow (39%) due to losses of MG5, both to agricultural intensification (particularly in Highland) and under-management. Upland Hay Meadow (equivalent to H6529) lost 19%. Net losses of Lowland Calcareous Grassland are low at 6.2%. Lowland Acid Grassland showed a 10% net area reduction which concerned only U4 (not U1), but this is heavily affected by loss at two sites from under-management and one from improvement; smaller losses elsewhere resulted from the same causes plus limited plantation and development. Purple Moor-grass & Rush Pasture showed a 9% reduction, but this is very heavily affected by loss of M25 at one site to plantation; additional plantation, under-management, and occasionally development and drainage have caused losses elsewhere.
- Net loss of Annex I habitat was low (3%) and largely due to losses of H6520 (19%) at two sites. Annex I H6210 / H6230 showed little loss (under 2%); this was mainly to encroachment of scrub and rarely to rank grasses. Similarly, Annex I H6410 (M26) showed negligible net loss (under 2%).

### **Current condition**

- 41% (by number) of all extant constituent NVC stands were in overall favourable condition by SSSI-standard positive indicator thresholds. This is around 12% less than the number of lowland grassland designated features recorded in favourable condition in 2010. 58% of stands were in favourable condition by reduced thresholds as used by Hewins et al (2005). 10% of stands were lost completely. For Annex I habitats only, the pass rate was higher at 79% (82% at reduced thresholds). However, many of these were calcareous grasslands which by virtue of their frequent location on steeper rocky ground were less liable to degradation.
- 48% (by number) of all extant constituent NVC stands were favourable for positive indicators using SSSI-standard thresholds (71% at reduced thresholds). The difference between these figures and overall favourability was most often due to failed targets for negative indicators, though occasionally failure was due to a poor grass:forb ratio. Low levels of eutrophication from atmospheric nitrogen deposition is known to contribute to a decline in species-richness.
- Pass rates for negative indicators were generally high, except for Lowland Meadow (MG5, 69%) and Annex I H6520 / Upland Hay Meadow (MG3, 38%), the latter largely due to under-management causing encroachment of rank grasses. Many unfavourable stands of Annex I H6210 / H6230 passed on positive indicators but failed on negative indicators. However, the opposite was true of many M23 (rush pasture) stands.
- The grass:forb ratio attribute, where applicable, was generally favourable, but caused overall failure of several MG5 stands, and very rarely other constituent NVC communities.
- Vegetation height was most often unfavourable for Annex I H6520 / Upland Hay Meadow (MG3), with only 6% favourable, and was accompanied by high levels of litter as a result of the growth of rank grasses from under-management. Other Annex I / BAP Priority habitats were largely favourable for height and litter.
- The bare ground attribute was nearly always favourable except for U1, a component of Lowland Acid Grassland, but a community which normally does exhibit bare ground. The bare ground target for this community was considered too low.
- Nearly half of surveyed stands suffered a degree of negative management, and this was most commonly under-management (insufficient grazing or cutting) followed by agricultural intensification. Built development and tree planting also had some impact. For Annex I habitats negative management (mostly under-management) was most pronounced for H6520 (MG3). For BAP Priority habitats under-management affected a third of stands, but agricultural intensification was also significant, with, again, small

losses to plantation and development. Regionally, losses to plantation were most significant in south-west Scotland. Development also had an appreciable effect in this area, as did agricultural intensification, which also strongly affected surveyed stands in Highland (particularly affecting MG5).

- The most botanically diverse local authority area judging from the surveyed stands was the Borders, which had a high concentration of rare or uncommon dry grassland types, such as CG7 with a number of uncommon and rare species including *Dianthus deltoides*. The Borders also holds possibly the best example of CG2 in Scotland, and one stand of CG1 which has not previously been recorded in Scotland. M23 in the Borders and Fife was typically species-poor but was generally not the main interest of the surveyed sites; there were rare notable occurrences in the Borders with *Valeriana dioica*. CG7 with *Dianthus deltoides* was also found in Fife. In Aberdeenshire, particularly diverse MG3 was noted near Balmoral, and the River Dee sites exhibited distinctly northern herb-rich variants of M27, U17 and MG9. In Highland (and occasionally Dumfries & Galloway) M23/25/26 were found with *Trollius europaeus*, *Crepis paludosa* and *Carum verticillatum*. A good example of MG5 with *Sanguisorba officinalis* and *Meum athamanticum* was recorded in Dumfries & Galloway, as well as one U4 stand with *Genista tinctoria*, and one U1 stand with *Jasione montana*. The one stand of MG8 was recorded in Moray but was in unfavourable condition. *Platanthera chlorantha* was found occasionally in all surveyed western, central and northern regions, and *P. bifolia* rarely in Renfrewshire and Highland.

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## 1. INTRODUCTION

This project concerns the extent and condition of non-designated species-rich lowland grassland in Scotland, corresponding to habitats defined in:

- the UK Biodiversity Action Plan<sup>1</sup> (BAP) Priority habitats and
- Annex I of EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive<sup>2</sup>).

These are known as BAP Priority habitats and Annex I habitats respectively. Lowland grasslands are considered to be those below the upper limits of enclosure or, where this is not clear, below 300m in altitude. “Species-rich” lowland grasslands are equivalent to the five BAP Priority lowland grassland habitats listed in Table 1. Annex I lowland grasslands are a small sub-set of these.

Grasslands designated as Sites of Special Scientific Interest (SSSIs) or Special Areas of Conservation (SACs) are not included in this project because these are monitored under SNH’s Site Condition Monitoring programme. This project is part of the SNH Surveillance Action Plan.

Many of Scotland’s species-rich lowland grasslands were first surveyed and mapped according to their National Vegetation Classification (NVC) communities (Rodwell, 1991, 1992) through a series of local surveys undertaken between 1983 and 2000 (MacKintosh 2004). MacKintosh extrapolated from the total extent recorded by these surveys to estimate the likely total extent of each NVC type throughout Scotland.

Estimates of the changing extent of lowland grassland BAP Priority habitats were reported under the [Biodiversity Action Reporting System](#) in 2005 and 2008 but the estimates had to be extrapolated from work in England (Hewins et. al., 2005) because there was no Scottish data on recent changes to lowland grassland extent or condition. This project provides Scottish data to show how the lowland grassland habitats outside designated sites have changed since they were first surveyed. It also provides an assessment of the condition of Scotland’s non-designated lowland grasslands, comparable to the assessment of designated grasslands that SNH undertakes on a regular basis under the Site Condition Monitoring (SCM) programme<sup>3</sup>. The project will contribute to BAP, Natura and broader trend assessments, and to future SRDP (Scotland Rural Development Programme) monitoring.

The primary objectives of this study were to:

- Estimate the change in extent and rate of change of BAP Priority and Natura Annex I lowland grassland habitats since the 1980s; and
- Assess the current condition of non-designated sites in Scotland.

The means of achieving this was to revisit a sample of previously surveyed sites with recorded BAP Priority or Annex I lowland grassland habitats and, at each one, to map the extent of these habitats and assess their condition. The condition assessment employed a modified version of SNH’s Lowland Grassland SCM Methodology, which is based on JNCC’s Common Standards Monitoring (CSM) Guidance for Lowland Grassland Habitats (JNCC, 2004).

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<sup>1</sup> The UK list of Priority Habitats is available at <http://jncc.defra.gov.uk/default.aspx?page=5155>

<sup>2</sup> EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna

<sup>3</sup> The Site Condition Monitoring programme is described in SNH report Condition of Designated Sites at <http://www.snh.gov.uk/docs/B686627.pdf>

BAP Priority and Annex I lowland grassland habitats are primarily identified in the UK by their constituent National Vegetation Classification (NVC) communities. The constituent NVC communities of BAP Priority and Annex I lowland grassland habitats occurring in Scotland are shown in Table 1 and Table 2 below.

*Table 1. Constituent NVC communities of BAP Priority lowland grassland habitats occurring in Scotland*

| <b>BAP Priority lowland grassland habitats</b> | <b>Constituent NVC communities</b>            |
|------------------------------------------------|-----------------------------------------------|
| Lowland Meadows (LM)                           | MG5, MG8                                      |
| Upland Hay Meadows (UHM)                       | MG3                                           |
| Lowland Dry Acid Grassland (LDAG)              | U1, U4                                        |
| Lowland Calcareous Grassland (LCG)             | CG1, CG2, CG7, CG10                           |
| Purple Moor-grass and Rush Pasture (PMRP)      | M22, M23, M24, M25 (except on deep peat), M26 |
| Calaminarian Grasslands (added in 2008)        | OV37, other un-described types                |

*Table 2. Constituent NVC communities of Annex I lowland grassland habitats occurring in Scotland*

| <b>Annex I lowland grassland habitats</b>                                                                      | <b>Corresponding BAP habitat</b>               | <b>Constituent NVC communities</b>                                     |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------|
| H6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i>                                            | Calaminarian grasslands                        | OV37 and other un-described types                                      |
| H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates ( <i>Festuco-Brometalia</i> ) | Lowland calcareous grassland (partially)       | CG1, CG2, CG7, and CG10 on limestone bedrock                           |
| H6230 Species-rich <i>Nardus</i> grassland on siliceous substrates in mountain areas                           | Lowland calcareous grassland (partially)       | CG10 in mountain areas (unless on limestone – see Annex I H6210 above) |
| H6410 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> )     | Purple moor-grass and rush pasture (partially) | M24 and M26                                                            |
| H6520 Mountain hay meadows                                                                                     | Upland hay meadows                             | MG3                                                                    |

Most of these communities have also been recorded in the uplands; the exceptions are CG1, CG2, CG7, M22 and M24. All of the Annex I habitats also occur in the uplands. Lowland calcareous grassland that is not on limestone and not in mountain areas is not included in the Annex I habitats.

Recorded occurrences of Calaminarian grasslands in Scotland are all in the uplands, except for those in Shetland which are designated features of Sites of Special Scientific Interest (SSSI) and thus excluded from this study. The Annex I H6130 Calaminarian grassland habitat and the BAP Priority Calaminarian Grasslands habitat are not therefore considered further in this report. M24 (*Molinia caerulea-Cirsium dissectum* fen-meadow) has been recorded from Taynish NNR but nowhere else in Scotland; neither was it recorded during this study, so discussion of Annex I H6410 excludes M24.

The term 'mountain areas' as employed in the Annex I H6230 description was defined by SNH as all areas north of the Highland Boundary Fault or in the Southern Uplands (including the Pentland Hills). To determine whether CG10 was on limestone bedrock, for inclusion in Annex I H6210, reference was made to the freely-available 1:625,000 UK bedrock geology dataset, and the British Geological Society was consulted.

## **2. METHODOLOGY**

### **2.1 Sample selection**

An initial sample of 261 grassland sites with constituent NVC communities of BAP Priority and Annex I lowland grassland habitats (as described in Table 1 and Table 2 above) was provided by SNH. These were selected from the SNH Lowland Grassland Database by stratified random sampling, so that each SNH Area was sampled roughly in proportion to the number of sites originally recorded there, and each NVC type was sampled roughly in proportion to the number of stands recorded throughout the country. The SNH Lowland Grassland Database contains grassland survey data collected between 1983 and 2001, of which 519 records included constituent NVC communities on non-designated sites. The chosen sample of sites was adjusted slightly by substitution of alternative nearby sites where the original survey information was not available, or where it became apparent that a site was contained within a designated site where the grassland is a designated feature.

The planned survey rate of 1.7 sites per day under-estimated the time required to gain access permission from landowners or occupiers, and the time required for travel to remote sites. The final number of sites visited was 227, 43.7% of the 519 qualifying sites (non-designated with constituent NVC communities).

### **2.2 Field survey**

A team of five surveyors was employed to re-survey the selected grassland sites. Surveys took place mostly between June 1<sup>st</sup> and the end of August, but a few sites were surveyed in the first two weeks of September, when it was judged that the main indicator species were still visible. At each site the surveyors first conducted a walk-over to identify and map any constituent NVC communities, using the original survey information as a guide. Mapping was carried out using A3 Ordnance Survey base maps generally printed at a scale of 1:5000, except in instances where sites were very small or large/long, in which case scales of 1:2500 and 1:10,000 were used as appropriate. For a very few sites which were of great length, base maps of 1:25,000 were used. The appropriate map scale was mostly deduced from the site area as given in the Lowland Grassland Database, and the location was taken from the supplied grid references. Some grid reference errors were noticed and corrected before surveys began; a few were still somewhat inaccurate and occasionally required surveyors to use alternative base maps.

It should be noted that whilst the base maps provided to the surveyors for this project were as far as possible appropriate to each site, the original survey maps were often considerably smaller, and the mapping often considerably coarser. The quality of the original grassland surveys, and the maps produced, is variable. Some early surveys also pre-date publication of the first NVC draft chapters, in which case the NVC communities recorded in the Lowland Grassland Database have been allocated retrospectively by SNH on the basis of site descriptions and species lists.

Areas of habitat in the Lowland Grassland Database have been determined by SNH using original maps and descriptions, for which a degree of estimation was often necessary. Early surveys often lacked good quality background maps for use in the field. 1:10,000 was the largest scale normally available in the 1980s and maps were traced by hand in pre-photocopier days.

At many sites in 2010-11, surveyors found constituent NVC communities that were not recorded in the Lowland Grassland Database. These were often small in area but not always. After consultation with SNH, these extra constituent NVC communities were also mapped and assessed, in addition to those which were expected. Where no constituent NVC communities remained, surveyors noted what had replaced them.

Many of the NVC records in the SNH Lowland Grassland Database are to community level only so mapping of constituent NVC communities for this project was restricted to community level. Sub-community information was in some cases given by the surveyors, but was not incorporated into the digitised GIS data as this was not a requirement; it would have also made digitising more time-consuming and would have added complication to the analysis. For the same reasons non-constituent NVC communities were also not recorded in the GIS dataset unless part of mosaics. Surveyors were not required to map non-constituent NVC communities, although some surveyors did record such information.

The basic unit of assessment was the stand – an area comprising all occurrences of one constituent NVC community within one site. A stand might consist of a single discrete patch or several patches within a management unit. It might be recorded as a proportion of a mosaic, along with other NVC communities.

For each stand at a site, an assessment was undertaken using a modified version of SNH's Site Condition Monitoring methodology. This entails recording the seven attributes listed below in each of 20 1m<sup>2</sup> samples distributed across each stand. (Site Condition Monitoring on designated sites also uses the attribute 'Indicators of local distinctiveness' but this relies on site-specific knowledge and could not be used in this project.)

*Sward Composition attributes:*

- Positive indicator species (Site Condition Monitoring normal SSSI target)
- Positive indicator species (reduced target for non-designated sites)
- Negative indicator species
- Grass:forb ratio (not used for acid grassland and mires)

*Sward Structure attributes:*

- Vegetation height
- Litter cover
- Bare ground

A brief description of each of these attributes and their relevance to the assessment of habitat condition is given below:

- Positive indicator species: a good representation of these species suggests that the habitat is floristically diverse, in good condition and of a relatively high degree of naturalness for the habitat type in question (these grassland habitats all being 'semi-natural' rather than completely natural of course). Each constituent NVC community has its own list of characteristic positive indicator species, though there is some overlap among communities in this respect. Where the combined number of species and their abundance among a set of samples exceeds a certain threshold the habitat is considered favourable in this respect: this threshold is the 'SCM normal target', but there is also a 'reduced target' which recognizes that these sites are, on average, likely to be less rich than those with a SSSI designation.
- Negative indicator species: these suggest that management (or the lack of it) is allowing certain common, vigorous species to become very abundant threatening the greater variety of less competitive species. Each constituent NVC community has the same set of negative indicator species.
- Grass-forb ratio: this measure of the relative abundance of grasses and other vascular species is used for neutral and calcareous grasslands; in general, a lower percentage cover of grasses tends to be associated with a floristically richer sward in better condition from a conservation viewpoint. This attribute is not used for acid

grasslands and mires because of the difficulty of separating grasses from the sedges and rushes common in these habitats.

- Vegetation height: in general taller swards are less floristically rich because smaller plants tend to be over-shaded and smothered by taller ones. The sward height threshold between favourable and unfavourable condition varies among different NVC communities.
- Litter cover: extensive mats of dead plant litter – mainly of grasses – tend to smother smaller plants and thereby reduce floristic diversity, so in general a less extensive litter mat (or even no litter mat at all) indicates better habitat condition.
- Bare ground: this is most commonly the result of trampling by large herbivores; in some NVC communities bare ground is considered a negative feature because of an association with trampling, soil compaction and overgrazing, but in certain types of short grassland containing many very small annual plants it is considered best to have at least a certain amount of bare ground in which these species can grow without being outcompeted by denser, more extensive swards of other species. Some invertebrates need small patches of bare soil.

Under Site Condition Monitoring, targets are set for each of the above attributes; these are the agreed UK standards for determining favourable condition of grassland habitats, with some minor adjustments for Scotland. Each constituent NVC community at a site was assessed as unfavourable if any of the sward composition attributes failed; if the targets for all these attributes were met the community was assessed as favourable. Sward structural attributes can change rapidly in response to management so are not used to determine overall condition. This is in accordance with SNH's Lowland Grassland Methodology for Site Condition Monitoring.

Non-designated grasslands do not receive the same level of agri-environment support as designated grasslands for management to maintain favourable condition. If it is assumed that agri-environment support enhances the condition of designated grasslands, non-designated grasslands will in poorer condition, on average, than designated grasslands. A reduced positive indicator species target was therefore used to provide information on grasslands not meeting the SSSI targets but still in moderately good condition. The reduced targets follow those used in England by Hewins et al (2005). A full description of the modified Site Condition Monitoring methodology is given in Appendix 5. Appendix 6 contains the assessment forms for each of the constituent NVC communities.

### **2.3 Data management**

Assessments were carried out in the field using paper forms arranged to fit on a double-sided A4 sheet. This information was later transferred into Excel spreadsheets by the surveyors themselves. The Excel forms were so designed that: a) data entry was restricted to certain cells and where possible was restricted to assigned values or numerical ranges; b) calculation of attributes was as far as possible automated; and c) warnings were given if data entry was incomplete. It had initially been proposed that data from paper forms would be transferred to Excel forms immediately after each survey using a laptop. However, data transfer and map neatening was in general done at a later date so that surveying could be continued while the weather was fine, and to avoid increasing the amount of time spent away from home at expense to the project.

Data was collated from the numerous resulting Excel spreadsheets into a single master spreadsheet by the project co-ordinator after all field work was finished. Digitising of constituent NVC communities was undertaken using ESRI ArcGIS. Appropriate topology

rules were established in ArcMap to prevent or minimise the probability of digitising errors, such as overlapping NVC polygons, or unintentional gaps and slivers. The GIS dataset was double-checked for such errors after completion of digitising. Areas of constituent NVC communities were extracted from the GIS dataset of digitised constituent NVC communities. For further technical detail on the procedure employed for managing and analysing the SCM and area data, refer to Appendix 4.

Plant nomenclature follows Stace (2<sup>nd</sup> Edition, 1997) for vascular plants. Lower plants are not identified to species under the survey methodology used here but the moss genus *Sphagnum* and the lichen genus *Cladonia* are referred to on recording forms.

### 3. RESULTS

A total of 227 sites were visited over the course of the 2010 and 2011 field seasons. These sites were distributed widely from Skye and Aberdeenshire in the north to Galloway and the Borders in the south. The previous surveys at these sites took place between 1983 and 1999, the average year of original survey being 1991 (hence some of the original surveys were undertaken prior to publication of the NVC's grassland chapters). The earliest original surveys were from Ayrshire and Dumfries & Galloway.

Table 3 gives a breakdown of the number of sites and the total area of sites according to local authority areas. Where the local authority is not listed in the table there were no NVC grassland surveys between 1983 and 2001, although, as in Perthshire, there may have been early surveys that pre-dated the NVC or surveys of SSSIs only. The largest number of sites visited was in Highland and Borders. Borders had the largest average site area (20.4 ha) and by far the largest total area of sites (note, however, that this is biased by a few particularly large sites including some large hills and long river valleys). Average site area was next largest in Renfrewshire (19.0 ha) where there are several large sites including parts of golf courses. By far the smallest average site area was in East and South Ayrshire (2.5 and 2.7 ha). North Ayrshire and West Lothian also had generally small sites. Highland has some very large sites but also contains a number of small crofting sites. The average site area across all sites was 11.2 ha, and the total area of surveyed sites was 2549 ha.

*Table 3. Number of sites visited, area of sites and average site area according to local authority areas*

| Local authority     | Number of sites | Area of sites (ha) | Average site area (ha) |
|---------------------|-----------------|--------------------|------------------------|
| Aberdeenshire       | 10              | 82                 | 8.2                    |
| Borders             | 43              | 878                | 20.4                   |
| Dumfries & Galloway | 10              | 126                | 12.6                   |
| East Ayrshire       | 7               | 17                 | 2.5                    |
| Fife                | 26              | 373                | 14.3                   |
| Highland            | 55              | 301                | 5.5                    |
| Inverclyde          | 4               | 58                 | 14.5                   |
| Moray               | 10              | 129                | 12.9                   |
| North Ayrshire      | 7               | 37                 | 5.4                    |
| Renfrewshire        | 16              | 304                | 19.0                   |
| South Ayrshire      | 12              | 32                 | 2.7                    |
| Stirling            | 14              | 146                | 10.5                   |
| West Lothian        | 13              | 65                 | 5.0                    |
| Total               | 227             | 2549               | 11.2                   |

The vegetation at each site typically consists of a mixture of constituent NVC communities (corresponding to BAP Priority and/or Annex I lowland grassland habitats) and other non-priority habitats. The total area of surveyed constituent NVC communities in this project was 677 ha, representing 27% of the total site areas. The remaining 73% of the surveyed area consisted of non-constituent NVC grasslands (largely dry or damp improved/semi-improved pastures comprising MG6, MG7, MG9 and MG10) and non-grassland habitats (mostly scrub (especially gorse), bracken, some mire and heath habitats, and small quantities of other habitats).

The rest of this Results section presents summaries of the:

- Extent of BAP Priority and Annex I lowland grassland habitats recorded;
- Change in extent of these habitats since the previous surveys;
- Condition of these habitats.

These summaries are presented as a series of tables, with accompanying text and map figures. The results are presented firstly for Annex I and BAP Priority habitats, then broken down by local authority area, and finally (in Appendix 2) by individual constituent NVC communities.

In the accompanying map figures below, the extremities of north-western and northern Scotland are excluded in order to maximise legibility; this project did not include any surveys in these excluded regions.

In tables and text relating to habitat condition, the 'Lost' category refers to those stands which have been completely lost, e.g. to plantation, scrub or agricultural improvement. It does not include those stands which have been identified as a different NVC community to that originally recorded but are still constituent NVC communities (for example there are several occurrences of U4 replacing originally-recorded MG5), or partial losses. It is possible that there are also instances of previously identified constituent NVC community areas being lost (or reduced), but at the same time additional area(s) of the same NVC type being identified on the site, so disguising the loss of the original mapped stand.

In these tables the following abbreviations are used:

For BAP Priority habitats:

|      |                                  |
|------|----------------------------------|
| LCG  | Lowland Calcareous Grassland     |
| LM   | Lowland Meadow                   |
| UHM  | Upland Hay Meadow                |
| LDAG | Lowland Dry Acid Grassland       |
| PMRP | Purple Moor-grass & Rush Pasture |

For Annex I habitats:

|      |                                                                                |
|------|--------------------------------------------------------------------------------|
| 6210 | Semi-natural dry grasslands and scrubland facies on calcareous substrates      |
| 6230 | Species-rich <i>Nardus</i> grassland on siliceous substrates in mountain areas |
| 6410 | <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils         |
| 6520 | Mountain hay meadows                                                           |

The full names of the National Vegetation Classification communities included in these tables are:

|      |                                                                                         |
|------|-----------------------------------------------------------------------------------------|
| CG1  | <i>Festuca ovina</i> - <i>Carlina vulgaris</i> grassland                                |
| CG2  | <i>Festuca ovina</i> - <i>Helictotrichon pratense</i> grassland                         |
| CG7  | <i>Festuca ovina</i> - <i>Hieracium pilosella</i> - <i>Thymus polytrichus</i> grassland |
| CG10 | <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Thymus polytrichus</i> grassland |
| MG3  | <i>Anthoxanthum odoratum</i> - <i>Geranium sylvaticum</i> meadow                        |
| MG5  | <i>Cynosurus cristatus</i> - <i>Centaurea nigra</i> meadow and pasture                  |
| MG8  | <i>Cynosurus cristatus</i> - <i>Caltha palustris</i> grassland                          |
| U1   | <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Rumex acetosella</i> grassland   |
| U4   | <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Galium saxatile</i> grassland    |
| M23  | <i>Juncus effusus</i> / <i>acutiflorus</i> - <i>Galium palustre</i> rush-pasture        |
| M25  | <i>Molinia caerulea</i> - <i>Potentilla erecta</i> mire                                 |
| M26  | <i>Molinia caerulea</i> - <i>Crepis paludosa</i> fen                                    |

For the purposes of this report, a few occurrences of vegetation recorded as transitional CG7-10, MG3-5 and U4-MG5 are respectively included within CG7 (because the *Mesobromion* elements impart Annex I H6210 status), MG5 (because this vegetation was insufficiently diverse to class as MG3), and U4 (because this vegetation was insufficiently diverse to class as MG5).

### 3.1 Distribution and extent of Annex I and BAP Priority lowland grasslands

Constituent NVC communities were not evenly distributed throughout the whole set of sites. Geographical variation of the constituent NVC communities recorded in 2010/2011 is summarized in Table 4. Figure 3 (page 28) and Figure 4 (page 29) in the section below on overall condition for all Annex I and BAP Priority habitats also illustrate the distribution of surveyed stands.

Table 4. Distributions of constituent NVC communities recorded

| NVC community                                                                                | Distribution at sites in this survey                                                                                    |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| CG1 <i>Festuca ovina</i> - <i>Carlina vulgaris</i> grassland                                 | extremely rare; previously recorded as CG2; found only at 1 southern coastal Borders site                               |
| CG2 <i>Festuca ovina</i> - <i>Helictotrichon pratense</i> grassland                          | very rare; at <1% of sites: 2 sites in Borders, 1 in Fife and one extremely small patch on lime-rich spoil in W Lothian |
| CG7 <i>Festuca ovina</i> - <i>Hieracium pilosella</i> - <i>Thymus polytrichus</i> grassland  | rare; at 4% of sites, all in SE: 13 in Borders and 7 in Fife                                                            |
| CG10 <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Thymus polytrichus</i> grassland | scarce; at 9% of sites; 21 in Borders, 9 in Highland and 13 scattered elsewhere; particularly scarce in SW              |
| MG3 <i>Anthoxanthum odoratum</i> - <i>Geranium sylvaticum</i> meadow                         | rare; at 4% of sites; 7 in Aberdeenshire, 5 in Highland, rare elsewhere and none in SE                                  |
| MG5 <i>Cynosurus cristatus</i> - <i>Centaurea nigra</i> meadow and pasture                   | uncommon; at 18% of sites; widespread; largest number (33) in Highland, others (56) throughout Scotland                 |
| MG8 <i>Cynosurus cristatus</i> - <i>Caltha palustris</i> grassland                           | extremely rare; at 1 site in Moray (previous reports at 2 other sites are deemed erroneous)                             |
| U1 <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Rumex acetosella</i> grassland     | scarce; at 6% of sites; 17 in Borders, 10 others scattered through southern Scotland                                    |
| U4 <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Galium saxatile</i> grassland      | common; at 25% of sites; widespread; largest number (33) in Borders, others (88) throughout Scotland                    |
| M23 <i>Juncus effusus</i> / <i>acutiflorus</i> - <i>Galium palustre</i> rush-pasture         | common; at 25% of sites; widespread; 88 in north and west, 32 scattered elsewhere                                       |
| M25 <i>Molinia caerulea</i> - <i>Potentilla erecta</i> mire                                  | scarce; at 8% of sites; widespread; 10 in Highland, 9 in Stirling, 19 scattered elsewhere                               |
| M26 <i>Molinia caerulea</i> - <i>Crepis paludosa</i> fen <sup>3</sup>                        | rare; at <2% of sites, all in Highland (7 sites) <sup>3</sup>                                                           |

Table 5 and Table 6 below give the total extent of Annex I and BAP Priority lowland grassland habitats found in this survey in 2010. These figures are broken down by local authority district and also by constituent NVC community.

<sup>3</sup> See discussion of M26 in Appendix 3 for commentary on the differing M26 interpretations amongst experienced surveyors, and our opinion concerning its status in Scotland.

U4 and M23 are by far the commonest and most extensive of these NVC communities found in this survey, accounting for over 50% and 25% respectively of the total surveyed constituent NVC community area, so it follows that the commonest and most extensive BAP Priority lowland grassland habitats are Lowland Dry Acid Grassland (355 ha, 52%) and Purple Moor-grass & Rush Pasture (214 ha, 32%). Together they account for about 84% of the total extent of BAP Priority lowland grassland habitat found in this survey.

Neither U4 nor M23 constitute Annex I habitats, so the total extent of Annex I habitat among the above twelve NVC communities is small, amounting to less than 6% (just over 40 ha) of the surveyed constituent NVC community area. Most of it is Annex I H6210 (CG1 / CG2 / CG7 / CG10 on limestone) and Annex I H6230 (CG10 in mountain areas not on limestone), occupying 12.41 ha and 19.93 ha respectively. There is only 3.5 ha of Annex I H6410 (M26<sup>4</sup>) and 4.5 ha of Annex I H6520 (MG3).

*Table 5. Area (ha) of Annex I habitats on surveyed sites, according to local authority areas. † = recorded in SNH Lowland Grassland Database (from original surveys or interpretations of them) but regarded as erroneous.*

| Local Authority     | 6210  | 6230  | 6410 | 6520 | Total |
|---------------------|-------|-------|------|------|-------|
| Aberdeenshire       |       | 0.16  |      | 1.42 | 1.58  |
| Borders             | 9.44  | 19.03 | †    | †    | 28.47 |
| Dumfries & Galloway |       |       |      | 0.06 | 0.06  |
| East Ayrshire       |       | 0.01  |      |      | 0.01  |
| Fife                | 2.94  |       |      | †    | 2.94  |
| Highland            | 0.02  | 0.46  | 3.49 | 2.19 | 6.16  |
| Moray               |       | 0.27  |      | 0.14 | 0.41  |
| Renfrewshire        |       |       |      | †    | †     |
| Stirling            |       |       | †    | 0.68 | 0.68  |
| West Lothian        | 0.01  |       |      |      | 0.01  |
| Total               | 12.41 | 19.93 | 3.49 | 4.49 | 40.32 |

*Table 6. Area (ha) of BAP Priority habitats on surveyed sites, according to local authority areas. † = recorded in SNH Lowland Grassland Database (from original surveys or interpretations of them) but regarded as erroneous.*

| Local Authority     | LCG   | UHM  | LM    | LDAG   | PMRP   | Total  |
|---------------------|-------|------|-------|--------|--------|--------|
| Aberdeenshire       | 0.16  | 1.42 | 0.46  | 8.80   | 9.56   | 20.41  |
| Borders             | 28.47 | †    | 17.55 | 160.89 | 44.64  | 251.55 |
| Dumfries & Galloway |       | 0.06 | 4.06  | 25.24  | 22.45  | 51.81  |
| East Ayrshire       | 0.01  |      | 5.04  | 3.50   | 4.25   | 12.80  |
| Fife                | 2.95  | †    | 2.12  | 70.14  | 6.39   | 81.59  |
| Highland            | 0.48  | 2.19 | 27.10 | 14.18  | 25.58  | 69.53  |
| Inverclyde          |       |      |       | 14.38  | 10.06  | 24.44  |
| Moray               | 0.27  | 0.14 | 6.17  | 6.79   | 2.13   | 15.50  |
| North Ayrshire      | 0.08  |      | †     | 3.56   | 11.73  | 15.37  |
| Renfrewshire        |       | †    | 4.75  | 33.28  | 19.47  | 57.50  |
| South Ayrshire      | 0.01  |      | 0.77  | 1.54   | 6.40   | 8.72   |
| Stirling            | 0.02  | 0.68 | 1.32  | 4.81   | 49.34  | 56.16  |
| West Lothian        | 0.01  |      | 2.22  | 7.47   | 1.89   | 11.60  |
| Total               | 32.47 | 4.49 | 71.56 | 354.58 | 213.89 | 676.99 |

<sup>4</sup> See discussion of M26 in Appendix 3 for commentary on the differing M26 interpretations amongst experienced surveyors, and our opinion concerning its status in Scotland.

The NVC types were generally recorded to community level only, as stipulated in the project brief, but sub-communities were quite often also noted in Borders, Dumfries & Galloway and Highland.

The total list of constituent NVC communities at sub-community level recorded in this survey is given below:

- M23a *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community
- M23b *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus effusus* sub-community
- M25a *Molinia caerulea-Potentilla erecta* mire, *Erica tetralix* sub-community
- M25b *Molinia caerulea-Potentilla erecta* mire, *Anthoxanthum odoratum* sub-community
- M25c *Molinia caerulea-Potentilla erecta* mire, *Angelica sylvestris* sub-community
- M26b *Molinia caerulea-Crepis paludosa* fen, *Festuca rubra* sub-community
- MG3b *Anthoxanthum odoratum-Geranium sylvaticum* meadow, *Briza media* sub-community
- MG3c *Anthoxanthum odoratum-Geranium sylvaticum* meadow, *Arrhenatherum elatius* sub-community
- MG5a *Cynosurus cristatus-Centaurea nigra* meadow and pasture, *Lathyrus pratensis* sub-community
- MG5b *Cynosurus cristatus-Centaurea nigra* meadow and pasture, *Galium verum* sub-community
- MG5c *Cynosurus cristatus-Centaurea nigra* meadow and pasture, *Danthonia decumbens* sub-community
- CG1e *Festuca ovina-Carlina vulgaris* grassland, *Koeleria macrantha* sub-community
- CG2d *Festuca ovina-Helictotrichon pratense* grassland, *Dicranum scoparium* sub-community
- CG7a *Festuca ovina-Hieracium pilosella-Thymus polytrichus* grassland, *Koeleria macrantha* sub-community
- CG10a *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland, *Trifolium repens-Luzula campestris* sub-community
- CG10b *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland, *Carex pulicaris-Carex panicea* sub-community
- U1b *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland, Typical sub-community
- U1d *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland, *Anthoxanthum odoratum-Lotus corniculatus* sub-community
- U1e *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland, *Galium saxatile-Potentilla erecta* sub-community
- U1f *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland, *Hypochaeris radicata* sub-community
- U4a *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, Typical sub-community
- U4b *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Holcus lanatus-Trifolium repens* sub-community
- U4c *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Lathyrus montanus-Stachys betonica* sub-community
- U4d *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Luzula multiflora-Rhytidadelphus loreus* sub-community
- U4e *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Vaccinium myrtillus-Deschampsia flexuosa* sub-community

## 3.2 Change in extent of Annex I and BAP Priority lowland grasslands

### 3.2.1 Estimate of accuracy of the comparison of old and new NVC surveys

NVC mapping is inherently subjective, as are other vegetation mapping systems such as Phase 1 habitat survey, primarily because of variation in placement of ecotone boundaries, different interpretations of the ranges of vegetation composition constituting different vegetation types, and differences in ability to detect and identify species. A recent study (Hearn *et al*, 2010) examined agreement between seven NVC surveys at the same site and found agreement at the NVC community level of only 34%. Agreement at the sub-community level was worse, but this is not relevant to the present study which only required identification to community level. This is the only study so far to have analysed NVC survey agreement. Two studies comparing Phase 1 habitat surveys (Cherrill & MacClean, 1995, 1999) found agreement of 44% and 26%.

During fieldwork for the present study, the authors revisited a sample of ten sites surveyed by other surveyors in the team. A similar analysis to that made by Hearn *et al* was undertaken to compare agreement between the two sets of maps for ten sites (six of which were small crofting sites), by employing a 10m or 5m grid overlay to manually count agreeing/disagreeing grid squares. This analysis only took account of the NVC communities relevant to this study. It was complicated by the presence of mosaic NVC polygons – for these, the number of grid squares in a polygon intersection of the two maps was counted, and then multiplied by the mosaic proportions of the relevant NVC community to give a figure for each map; the lower figure was treated as the number of agreeing grid squares, and the larger one as disagreeing grid squares. Hearn *et al* were able to ignore mosaics because they were rare in the surveys in that study. It is very common, however, to employ mosaics in NVC surveys because NVC communities can occur in patches too small to map within a more extensive community, but importantly also because time restrictions frequently mean (as they did for this study) that separate mapping of communities in complex mosaics is not possible.

The results of the grid analysis for this study found a rate of agreement of 43%. Many of the sites contributing to that figure included vegetation where disagreement between surveyors was quite likely and separation of vegetation particularly prone to subjectivity. This includes: M25 and M15 (which are often difficult to delineate and were the cause of some of the disagreement in the study by Hearn *et al*, and caused the biggest disagreement of the ten sites compared for this study); MG5 and non-NVC grassland probably derived from MG5 by agricultural intensification; MG5 in the process of gradual conversion to MG1 through under-management; wet vegetation with gradually intermingled MG10, M23 and MG9; and some vegetation at the borderline between M23 and M27.

A rate of agreement of 43% may sound low but it is notable that this is almost at the level of the most accurate of the published rates for Phase 1 habitat surveys and well above the 34% agreement found by Hearn *et. al.* for NVC surveys. NVC surveys are more complex than Phase 1 surveys and might be expected to show less agreement. Further confidence in the level of consistency between surveyors is provided by the fact that the total lowland grassland BAP Priority area for the ten sites analysed varied little between the two sets of maps, the bigger area being only 3% larger than the smaller. This lends support to the reliability of the assessments of overall change in extent described in section 3.2.3.

The current study followed all the recommendations made by Hearn *et. al.* for maximising consistency between surveyors, by following a standard NVC mapping protocol, training surveyors, monitoring their work and using aerial images to aid mapping.

### 3.2.2 *Uncorrected calculation of changes in extent*

At most sites the extent of the constituent NVC communities was found to differ from that recorded in or estimated from the previous surveys. Table 45 and Table 46 in Appendix 1 show the apparent difference in hectares between the extent of Annex I and BAP Priority lowland grassland habitats found in the original surveys (between 1983 and 1999) and the 2010/2011 surveys. A positive figure indicates a higher recorded extent in the new survey than in the original survey; a negative figure indicates a reduced extent. These figures are broken down by local authority area.

Table 47 and Table 48 in Appendix 1 show, for Annex I and BAP Priority habitats, the apparent percentage difference between the original mapped extent and that mapped in 2010 and 2011. Red infinity symbols indicate where none of that community was previously recorded in that local authority area at the sites surveyed, so that the percentage increase is technically infinite (however, it is thought likely that these previously-unmapped communities were in fact present, but recorded differently or missed). These have been excluded from the totals and sub-totals, which would otherwise also be infinite.

Table 49 and Table 50 in Appendix 1 show the estimated rate of change of BAP Priority and Annex I lowland grassland habitats, in hectares per year. These rates have been calculated by using (for each site surveyed in 2010/2011) data from the SNH Lowland Grassland Database giving the estimated original areas of constituent NVC communities, new areas of constituent NVC communities at each site extracted from the new digitised GIS dataset, and the time difference (in years) between original and new surveys.

Overall, the apparent extent of all BAP Priority habitats together (and by definition all constituent NVC communities) recorded in this survey appears to be 167 ha less than in the original surveys at these same sites. This seems to represent a reduction in extent of almost 20%. For Annex I habitats, there is an apparent 0.42% overall decrease in extent, which hides an apparent decrease in H6520 (MG3) of 41% and an apparent gain in H6410 (M26) of 83%. However, these apparent changes in area are subject to errors such as those arising from differences in mapping accuracy between surveys and from the method of estimating many former NVC extents in the Lowland Grassland Database. Therefore we consider that the changes shown in Appendix 1 are not wholly accurate, and we have produced a second analysis of changes in extent using corrected figures, described in section 3.2.3 and shown in Table 7 through to Table 12.

Purple Moor-grass & Rush Pasture (PMRP) in Fife provides an extreme example of an inaccurate estimate of area change. This habitat (mostly as M23) was recorded at eight Fife stands, for which only one had a previous record in the Lowland Grassland Database, and, unusually, the original area appears to be underestimated by a factor of 6 (change in extent at this site is particularly unlikely). The lack of PMRP records for the other stands is probably because they are not the main interest of the sites, often comprising only small patches of poor M23. These two factors combine to give an apparent increase of over 2000% in PMRP in Fife. The two most extensive M23 stands at these Fife sites have both been verified by the present authors, and change in extent is considered very unlikely at either of these sites, and for the much smaller extents at the other sites. Thus the apparent change of PMRP in Fife of 2000% is certainly incorrect, and the change is most probably zero.

For the most part, however, it seems likely that any inaccuracies of area estimates in the Lowland Grassland Database were caused by the difficulty of estimating areas from maps drawn to lower standards than the current norm, when large scale OS maps were not easily available, electronic digitisation was not possible and area measurements were made by dot-grid. They were the best estimates that could be achieved at the time.

### 3.2.3 *Corrected calculation of changes in extent*

To attempt to get a better grasp of the likely real changes in extent, we have undertaken a second area analysis which incorporates the judgement of the surveyors (or, for some of the 2010 data, the authors) as to whether each assessed community is considered likely to have changed in extent during the time between surveys, through reference to previous and current mapping, site descriptions, and knowledge of the communities in question. For each community assessment, note has been made of whether the community was: a) present, absent or newly recorded; b) if present or newly recorded, whether it is likely to have changed in extent; and c) if absent, whether it has been genuinely lost or is judged to have never been present (i.e. an error resulting from misinterpretation of the old surveys in the Lowland Grassland Database, or, in the surveyor's opinion, an error in the original survey).

The following points were noted from this exercise:

- Where stands are judged not likely to have changed significantly in extent, the old areas in the Lowland Grassland Database are nevertheless an average of 770% larger than the currently recorded stand extents (note that losses resulting from differing re-interpretation of a constituent NVC community should be balanced by gains such as MG5 re-interpreted as U4, or CG7 as CG10).
- The largest twenty of the above discrepancies in the Lowland Grassland Database are all in excess of 1000%. 11 of these are dry communities such as U1 or CG10 which typically occur in small patches so are easy to map too extensively in the field, or to overestimate from the many rough original surveys which often only indicate the approximate location of small stands. The rest are MG5, M25 and U4 and, by reference to site maps, these old areas appear to be certainly overestimated because of original mapping inaccuracy. The largest discrepancy exceeds 13000% and concerns a small area of U4 on steep ground within a plantation which could never have been significantly different in size.
- Excluding these twenty largest discrepancies, the old area measurements still appear to be, on average, 85% larger than 2010/2011 measurements for those stands considered not likely to have changed.
- 56 stands are, in the surveyors' opinions, considered to have never been present (i.e. not genuinely lost but erroneously recorded in the original survey and/or Lowland Grassland Database).

For the second area analysis, where a decrease in extent is genuinely likely to have occurred the degree of loss has been designated as small, medium, large or very large (again through reference to site descriptions and maps), and these losses assigned percentages of 10%, 25%, 50% and 75% respectively (total loss is obviously 100%). These loss estimates have been used to reconstruct the original area from the current area for losses judged to be genuine (with the exception of total loss, for which there is no new area and the old area in the Lowland Grassland Database must be relied upon). Where change is not thought likely to have occurred, or this is too difficult to decide (usually because of very rough original surveys), the change has been assumed to be zero. Although subjective, this method avoids as far as possible the apparent overestimate (on average) of original areas in the Lowland Grassland Database, and we consider the results to be closer to reality than those of the uncorrected area analysis.

The results of this second analysis are given in Table 13 through to Table 18 showing area change (ha), percentage area change and estimated change per year for Annex I and BAP Priority habitats. Estimated losses given in these tables are also probably overestimates to some extent, because for those stands which are thought to have been genuinely lost the old area must be taken from the Lowland Grassland Database which, as mentioned above, appears to overestimate areas on average. The maps in Figures 1 and 2 below show where loss is considered to have occurred for surveyed stands of Annex I and BAP habitats

respectively, according to the second (corrected) area analysis; approximate level of loss is symbolised at five levels from small to complete.

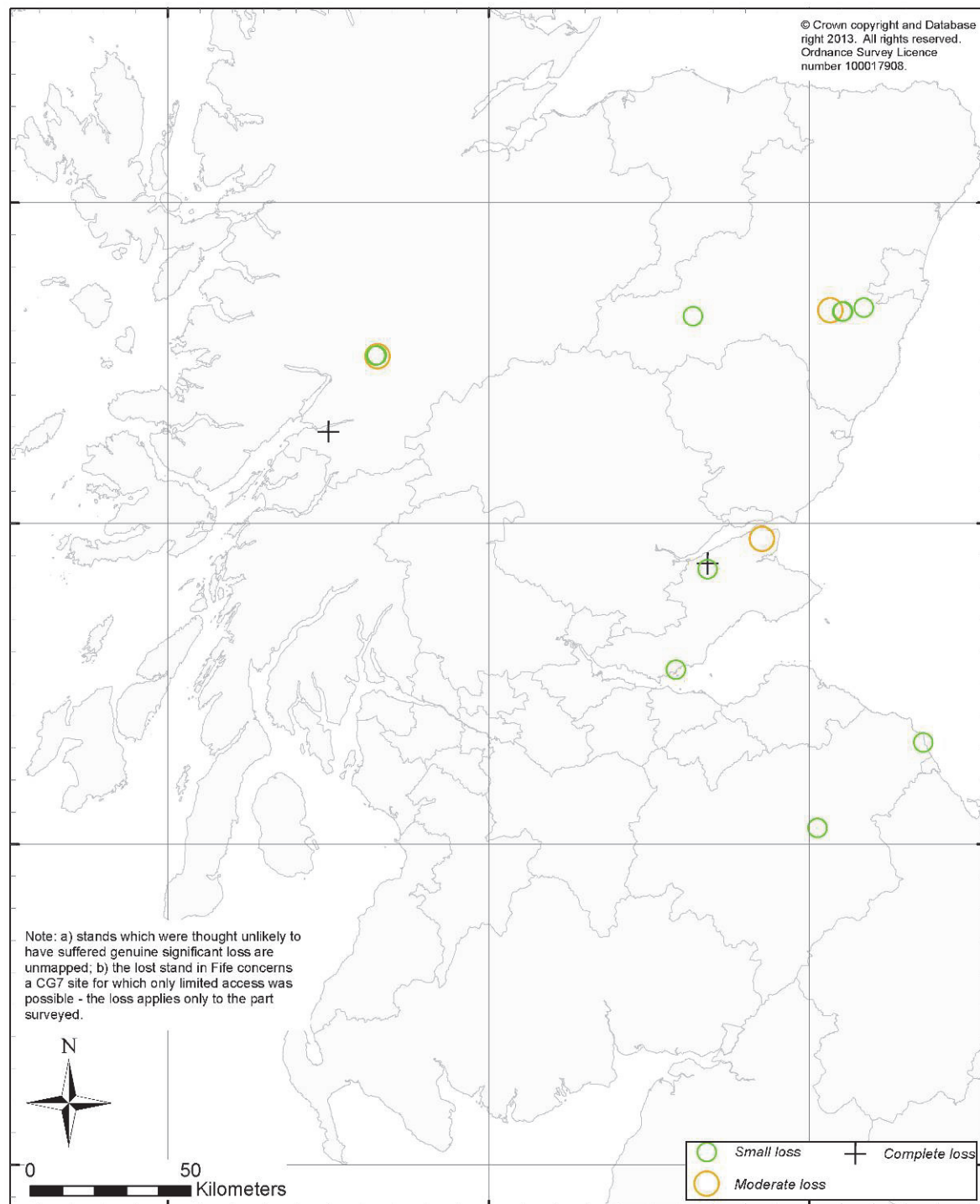


Figure 1. Approximate proportion of area loss at surveyed Annex I grassland sample stands

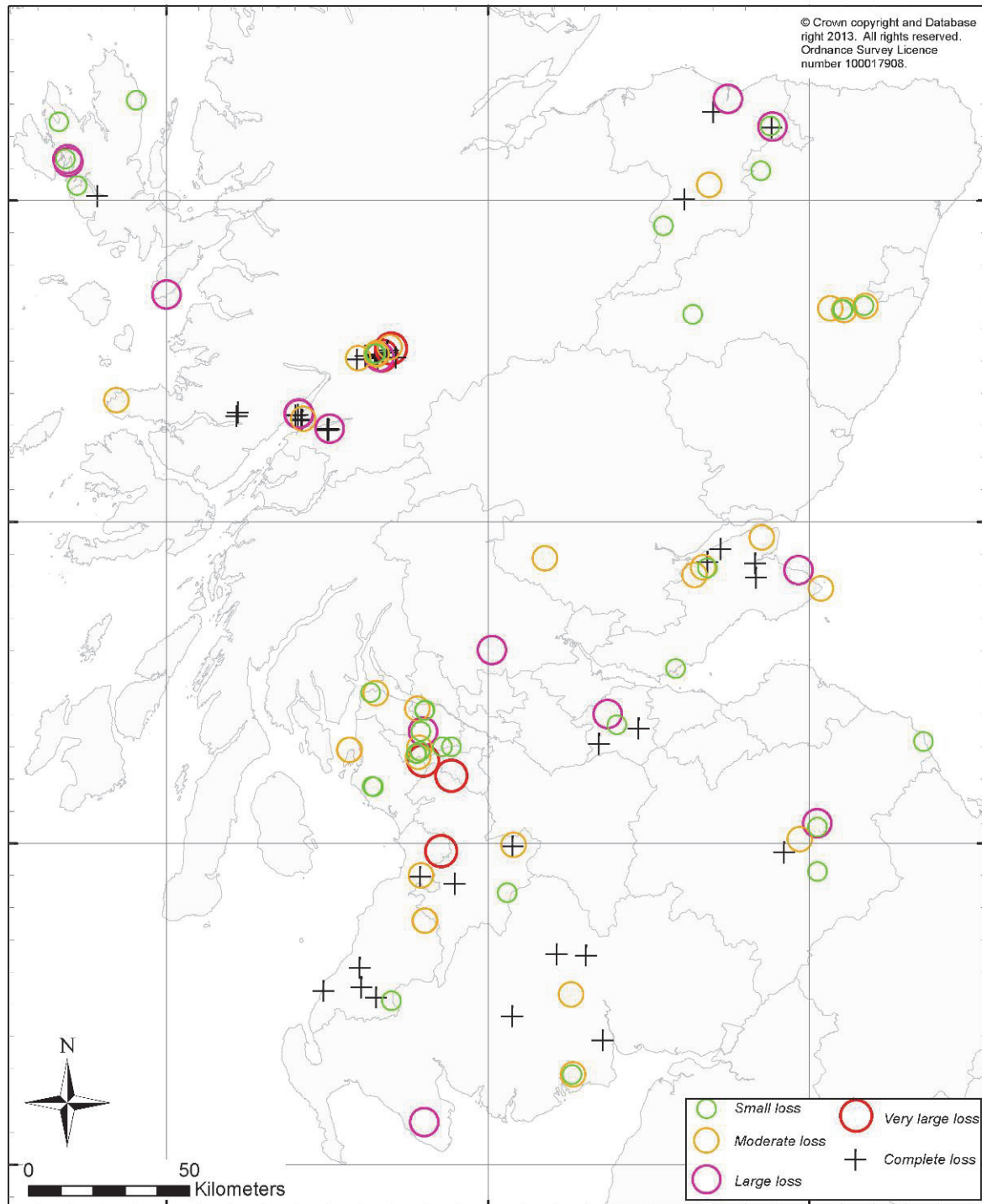


*Figure 2. Approximate proportion of area loss at surveyed BAP Priority grassland sample stands*

The following points are apparent from the second (corrected) area analysis:

- There are 55 entirely lost stands (10% of those surveyed). 88 stands appear to exhibit a degree of loss, but most of this seems to be small in extent. These combined losses occur across 105 sites, i.e. 46% of the surveyed sites exhibit a degree of loss. Significant loss occurs at 62 sites (27% of sites).
- The regions with the largest number of stands showing clear losses are Highland (51), Fife (13), Renfrewshire (12), South Ayrshire (11) and Dumfries & Galloway (10). However, these figures are affected by the total number of stands surveyed in each

region; in percentage terms, the following regions stood out by having over 30% of stands affected by some degree of loss: East Ayrshire (44% of stands affected), Aberdeenshire (41% of stands affected), Renfrewshire (39%), Highland (39%), Moray (38%), South Ayrshire (37%) and Dumfries & Galloway (36%).

- In terms of total area, the following regions stood out by exhibiting over 10ha of loss: Dumfries & Galloway (33ha), Highland (28ha), Moray (14ha) and Borders (13ha). The losses in Dumfries & Galloway, Moray and Borders are largely due to losses at three sites, two sites and one site in these regions respectively. Overall loss in the Borders is heavily swayed by this single site which has lost a large part of its U4 to resown grass. Other than this, there is thought to be little loss in this region, many of the sites having dry communities in topological locations which make loss unlikely except perhaps by scrub encroachment (which is a minor factor in the Borders).
- In terms of Annex I habitats, overall percentage area loss appears to be low, at 3.2%. This is largely from the H6520 habitat (MG3), whose losses largely stem from two sites.
- In terms of BAP Priority habitats, the largest overall percentage area loss appears to have been suffered by Lowland Meadow (MG5), at 39%. The biggest % losses for individual local authorities were in South Ayrshire (78%) and Dumfries & Galloway (72%), with Fife, Highland, Moray and Renfrewshire also showing large percentage losses (59%, 46%, 37% and 19%). However, the greatest area losses by far occurred in Highland and Dumfries & Galloway.
- Upland Hay Meadow (Annex I H6520 / MG3) shows a 19% area reduction, although this is mostly due to only 2 small stands in the Highlands as mentioned above.
- Lowland Dry Acid Grassland (U1, U4) shows a 10% area reduction, which is entirely from U4. This is affected heavily by the loss of U4 at 2 stands in Moray from under-management and at one Borders site from improvement.
- Purple Moor-grass and Rush Pasture shows a 9% area reduction, which is largely accounted for by loss of M25 at one site in Dumfries & Galloway, plus some M23, mainly to plantations. Tree planting is amongst the factors leading to further losses of M23 and M25 in nearby Ayrshire.
- Lowland Calcareous Grassland exhibits the least area reduction, at 6.2%. As mentioned above, CG1, CG2 and CG7 (all Annex I H6210) suffer only slight loss, so the main loss from this BAP habitat is of CG10 (including some Annex I H6210 / H6230), largely at six sites (owing to both overgrazing and under-management). The difference in percentage loss between Annex I H6210 / H6230 and all Lowland Calcareous Grassland is due to loss at a few sites not in mountain areas nor on limestone bedrock, which therefore do not contribute to Annex I H6210 / H6230 loss.

*Table 7. Corrected analysis: difference in area (ha) of Annex I habitats between original and new surveys, incorporating surveyor judgement on likelihood of change having occurred.*

| Local Authority     | 6210  | 6230  | 6410  | 6520  | Total |
|---------------------|-------|-------|-------|-------|-------|
| Aberdeenshire       |       | -0.02 |       | -0.05 | -0.07 |
| Borders             | -0.11 | 0     |       |       | -0.11 |
| Dumfries & Galloway |       |       |       | 0     | 0     |
| East Ayrshire       |       | 0     |       |       | 0     |
| Fife                | -0.11 |       |       |       | -0.11 |
| Highland            | 0     | 0     | -0.05 | -0.99 | -1.04 |
| Moray               |       | 0     |       | 0     | 0     |
| Stirling            |       |       |       | 0     | 0     |
| West Lothian        | 0     |       |       |       | 0     |
| Total               | -0.22 | -0.02 | -0.05 | -1.04 | -1.33 |

*Table 8. Corrected analysis: difference in area (ha) of BAP Priority habitats between original and new surveys, incorporating surveyor judgement on likelihood of change having occurred.*

| <b>Local Authority</b> | <b>LCG</b>   | <b>UHM</b>   | <b>LM</b>     | <b>LDAG</b>   | <b>PMRP</b>   | <b>Total</b>   |
|------------------------|--------------|--------------|---------------|---------------|---------------|----------------|
| Aberdeenshire          | -0.02        | -0.05        | -0.02         | -0.91         |               | -0.99          |
| Borders                | -0.11        |              | -0.44         | -12.20        |               | -12.75         |
| Dumfries & Galloway    |              |              | -10.69        | -6.55         | -16.20        | -33.43         |
| East Ayrshire          |              |              | -0.56         | -0.40         | -0.82         | -1.77          |
| Fife                   | -0.92        |              | -3.15         | -1.05         |               | -5.12          |
| Highland               |              | -0.99        | -21.99        | -3.07         | -1.06         | -27.11         |
| Inverclyde             |              |              |               |               | -0.04         | -0.04          |
| Moray                  |              |              | -3.71         | -9.91         | -0.07         | -13.69         |
| North Ayrshire         |              |              |               | -0.42         | -1.76         | -2.18          |
| Renfrewshire           |              |              | -1.13         | -3.82         | -0.97         | -5.92          |
| South Ayrshire         | -1.10        |              | -2.74         |               | -0.22         | -4.06          |
| Stirling               |              |              | -0.05         | -0.15         |               | -0.21          |
| West Lothian           |              |              |               | -1.58         | -0.01         | -1.58          |
| <b>Total</b>           | <b>-2.15</b> | <b>-1.04</b> | <b>-44.48</b> | <b>-40.06</b> | <b>-21.14</b> | <b>-108.87</b> |

*Table 9. Corrected analysis: percentage (%) difference in area of Annex I habitats between original and new surveys, incorporating surveyor judgement on likelihood of change having occurred.*

| <b>Local Authority</b> | <b>6210</b>  | <b>6230</b>  | <b>6410</b>  | <b>6520</b>   | <b>Total</b> |
|------------------------|--------------|--------------|--------------|---------------|--------------|
| Aberdeenshire          |              | -10.00       |              | -3.57         | -4.26        |
| Borders                | -1.18        | 0            |              |               | -0.39        |
| Dumfries & Galloway    |              |              |              | 0             | 0            |
| East Ayrshire          |              | 0            |              |               | 0            |
| Fife                   | -3.50        |              |              |               | -3.50        |
| Highland               | 0            | 0            | -1.49        | -31.17        | -14.48       |
| Moray                  |              | 0            |              | 0             | 0            |
| Stirling               |              |              |              | 0             | 0            |
| West Lothian           | 0            |              |              |               | 0            |
| <b>Total</b>           | <b>-1.74</b> | <b>-0.09</b> | <b>-1.49</b> | <b>-18.86</b> | <b>-3.20</b> |

*Table 10. Corrected analysis: percentage (%) difference in area of BAP Priority habitats between original and new surveys, incorporating surveyor judgement on likelihood of change having occurred.*

| <b>Local Authority</b> | <b>LCG</b>   | <b>UHM</b>    | <b>LM</b>     | <b>LDAG</b>   | <b>PMRP</b>  | <b>Total</b>  |
|------------------------|--------------|---------------|---------------|---------------|--------------|---------------|
| Aberdeenshire          | -10.00       | -3.57         | -3.63         | -9.34         | 0            | -4.65         |
| Borders                | -0.39        |               | -2.46         | -7.05         | 0            | -4.82         |
| Dumfries & Galloway    |              | 0             | -72.49        | -20.59        | -41.92       | -39.22        |
| East Ayrshire          | 0            |               | -9.94         | -10.17        | -16.16       | -12.16        |
| Fife                   | -23.88       |               | -59.69        | -1.48         | 0            | -5.91         |
| Highland               | 0.00         | -31.17        | -46.23        | -17.79        | -3.60        | -28.68        |
| Inverclyde             |              |               |               | 0.00          | -0.37        | -0.15         |
| Moray                  | 0            | 0             | -37.53        | -59.35        | -3.29        | -46.91        |
| North Ayrshire         | 0            |               |               | -10.61        | -13.02       | -12.41        |
| Renfrewshire           |              |               | -19.27        | -10.31        | -4.73        | -9.34         |
| South Ayrshire         | -98.93       |               | -78.04        | 0             | -3.32        | -31.75        |
| Stirling               | 0            | 0             | -3.99         | -3.04         | 0            | -0.36         |
| West Lothian           | 0            |               | 0             | -17.43        | -0.27        | -12.00        |
| <b>Total</b>           | <b>-6.22</b> | <b>-18.86</b> | <b>-38.93</b> | <b>-10.15</b> | <b>-8.95</b> | <b>-13.93</b> |

*Table 11. Corrected analysis: estimated rate of change (ha/yr) of Annex I habitats, incorporating surveyor judgement on likelihood of change having occurred.*

| Local Authority     | 6210   | 6230   | 6410   | 6520   | Total  |
|---------------------|--------|--------|--------|--------|--------|
| Aberdeenshire       |        | -0.001 |        | -0.002 | -0.003 |
| Borders             | -0.009 | 0      |        |        | -0.009 |
| Dumfries & Galloway |        |        |        | 0      | 0      |
| East Ayrshire       |        | 0      |        |        | 0      |
| Fife                | -0.006 |        |        |        | -0.006 |
| Highland            | 0      | 0      | -0.003 | -0.057 | -0.060 |
| Moray               |        | 0      |        | 0      | 0      |
| Stirling            |        |        |        | 0      | 0      |
| West Lothian        | 0      |        |        |        | 0      |
| Total               | -0.015 | -0.001 | -0.003 | -0.059 | -0.078 |

*Table 12. Corrected analysis: estimated rate of change (ha/yr1) of BAP Priority habitats, incorporating surveyor judgement on likelihood of change having occurred.*

| Local Authority     | LCG    | UHM    | LM     | LDAG   | PMRP    | Total  |
|---------------------|--------|--------|--------|--------|---------|--------|
| Aberdeenshire       | -0.001 | -0.002 | -0.001 | -0.038 | 0       | -0.042 |
| Borders             | -0.009 |        | -0.034 | -0.682 | 0       | -0.725 |
| Dumfries & Galloway |        | 0      | -0.465 | -0.285 | -0.704  | -1.454 |
| East Ayrshire       | 0      |        | -0.020 | -0.014 | -0.030  | -0.065 |
| Fife                | -0.044 |        | -0.146 | -0.049 | 0       | -0.238 |
| Highland            | 0      | -0.057 | -1.207 | -0.175 | -0.061  | -1.501 |
| Inverclyde          |        |        |        | 0      | -0.002  | -0.002 |
| Moray               | 0      | 0      | -0.229 | -0.504 | -0.005  | -0.738 |
| North Ayrshire      | 0      |        |        | -0.015 | -0.063  | -0.078 |
| Renfrewshire        |        |        | -0.071 | -0.229 | -0.060  | -0.360 |
| South Ayrshire      | -0.039 |        | -0.101 | 0.000  | -0.008  | -0.148 |
| Stirling            | 0      | 0      | -0.003 | -0.008 | 0       | -0.011 |
| West Lothian        | 0      |        | 0      | -0.099 | >-0.001 | -0.099 |
| Total               | -0.093 | -0.059 | -2.276 | -2.098 | -0.934  | -5.461 |

### 3.3 Condition of Annex I and BAP Priority lowland grasslands

This section of the report presents summaries of the information recorded to describe the condition of each constituent BAP Priority and Annex I lowland grassland NVC community at each site. These summaries are ordered according to the various Site Condition Monitoring attributes for which data were recorded: positive indicator species, negative indicator species, grass-forb ratio, vegetation height, litter layer and bare ground. Overall condition and positive indicators are considered at two levels, firstly using SSSI-standard SCM thresholds and, secondly, using reduced thresholds applicable to non-SSSI sites (see Methodology).

For each attribute there are separate tables for BAP Priority habitats and Annex I habitats, and in each table the data are broken down according to local authority areas. Tables showing the data for individual NVC communities are necessarily large so are given separately in Appendix 2. Each of these tables shows how many stands of each habitat type were found to be in each of three condition categories: 'Favourable condition', 'Unfavourable condition' and 'Lost'.

The 'Lost' category refers to those stands which have been completely lost, for example to plantation, scrub or agricultural improvement. It does not include those stands which are

thought to have been identified erroneously in the original surveys (for example, there are several occurrences of U4 replacing originally-recorded MG5, which does not constitute genuine loss), or partial losses. It is possible that there are also instances of previously identified constituent NVC community areas being lost (or reduced), but at the same time additional area(s) of the same NVC type being identified on the site, so disguising the loss of the original mapped stand.

A 'stand' is the total extent of a constituent NVC community, Annex I or BAP Priority habitat at a single site.

This section begins with summaries of the overall condition of stands; i.e. condition according to all attributes taken together.

### *3.3.1 Overall condition*

The tables and figures in this section show the distribution and overall condition of surveyed Annex I and BAP Priority grassland habitats, using both SCM and reduced positive indicator thresholds. Tabulated data for separate constituent NVC communities are given in Appendix 2.

Table 13 shows the numbers of and percentages of existing stands which have been surveyed and of stands which have been lost. The latter excludes records given in the Lowland Grassland Database which are regarded as erroneous (i.e. communities which the surveyors regarded as not having existed originally). 10% (55 stands) of the surveyed stands were recorded as lost completely. Note that this takes no account of the additional partial loss of stands which has often also occurred, at variable levels for different habitats and regions, and which is described under the 'Change in extent...' section above.

Of the existing surveyed stands considered together as a whole, 41% were found to be in overall favourable condition using the normal SSSI-standard SCM threshold for positive indicators (see Positive Indicators section below). Naturally, the number of stands in overall favourable condition using the reduced threshold for positive indicators is higher, at 58% (Table 14). The proportions of favourable and unfavourable stands were not uniform throughout the local authority areas or among the various vegetation types.

In terms of Annex I habitats (Table 15 and Table 16), the pass rates for existing surveyed stands are very high for H6410 at 83% (100% at reduced thresholds), H6210 at 79% (82% at reduced thresholds, reflecting the high pass rates of CG2 and CG7) and H6230 at 68% (85% at reduced thresholds). The remaining habitat type H6520 (MG3), however, has a much lower proportion that is favourable (19%, 25% at reduced thresholds). Note that there are relatively few stands contributing to the H6410 figure, and there is contention over the interpretation of M26 (see M26 in Appendix 3).

For surveyed stands of BAP Priority habitats (Table 17 and Table 18), the percentage in favourable condition is similarly lowest for Upland Hay Meadow at 19% (25% at reduced thresholds) since this is the same as Annex I H6520. Lowland Meadow (all MG5 except for one stand of MG8 which fails overall) has a lower proportion in favourable condition, at 35% (49% at reduced thresholds), as has Purple Moor-grass & Rush Pasture, at 25% (48% at reduced thresholds). With regard to the latter, the favourability of all M26 noted above is obscured by the much lower favourability rates of M23 at 18% (42% at reduced thresholds) and M25 at 41% (57% at reduced thresholds). Roughly half of Lowland Dry Acid Grassland is favourable overall at 47% (66% at reduced thresholds), with U1 faring rather better at 67% than U4 at 42%. A large proportion of Lowland Calcareous Grassland is favourable at 75% (85% at reduced thresholds), again reflecting the high proportion of most of the calcareous communities in favourable condition.

Geographically (Table 13), the percentage of stands in overall favourable condition (using the reduced positive indicator thresholds) was highest at 80% in North Ayrshire, with Borders, Fife and Inverclyde all exceeding 60% favourable. The lowest overall favourability was found in Renfrewshire and South Ayrshire (32%), with low rates also for Aberdeenshire and East Ayrshire (40% and 44% respectively). Whilst overall pass rates using the stricter SCM positive indicator thresholds were, as expected, generally lower by up to 50%, Inverclyde appears to stand out by having the lowest proportion in unfavourable condition at the SCM thresholds (11%) despite having a high proportion in favourable condition at the reduced thresholds (67%); this is largely the result of the Inverclyde stands possessing insufficient positive indicator species for the higher SCM thresholds, whilst frequently containing enough to pass the reduced thresholds (see positive indicators section below).

*Table 13. Numbers/percentages of all sample stands surveyed ('existing'), and those recorded in the Lowland Grassland Database but regarded as lost ('lost' excludes records in the Database judged to be erroneous), according to local authorities*

| Local Authority     | existing | %    | lost | %   | Total |
|---------------------|----------|------|------|-----|-------|
| Aberdeenshire       | 20       | 100% |      | 0%  | 20    |
| Borders             | 121      | 99%  | 1    | 1%  | 122   |
| Dumfries & Galloway | 22       | 79%  | 6    | 21% | 28    |
| East Ayrshire       | 16       | 89%  | 2    | 11% | 18    |
| Fife                | 42       | 86%  | 7    | 14% | 49    |
| Highland            | 91       | 76%  | 28   | 24% | 119   |
| Inverclyde          | 9        | 100% |      | 0%  | 9     |
| Moray               | 17       | 85%  | 3    | 15% | 20    |
| North Ayrshire      | 15       | 100% |      | 0%  | 15    |
| Renfrewshire        | 31       | 100% |      | 0%  | 31    |
| South Ayrshire      | 25       | 83%  | 5    | 17% | 30    |
| Stirling            | 40       | 100% |      | 0%  | 40    |
| West Lothian        | 22       | 88%  | 3    | 12% | 25    |
| Total               | 471      | 90%  | 55   | 10% | 526   |

*Table 14. Overall condition using both normal SCM positive indicator and reduced ('red') positive indicator thresholds (unfavourable [U] or favourable [F]) of all existing sample stands, with percentages, according to local authorities*

| Local Authority     | F overall (SCM) | U overall (SCM) | F overall (red) | U overall (red) |
|---------------------|-----------------|-----------------|-----------------|-----------------|
| Aberdeenshire       | 30%             | 70%             | 40%             | 60%             |
| Borders             | 60%             | 40%             | 68%             | 32%             |
| Dumfries & Galloway | 50%             | 50%             | 59%             | 41%             |
| East Ayrshire       | 19%             | 81%             | 44%             | 56%             |
| Fife                | 36%             | 64%             | 69%             | 31%             |
| Highland            | 40%             | 60%             | 59%             | 41%             |
| Inverclyde          | 11%             | 89%             | 67%             | 33%             |
| Moray               | 35%             | 65%             | 65%             | 35%             |
| North Ayrshire      | 53%             | 47%             | 80%             | 20%             |
| Renfrewshire        | 16%             | 84%             | 32%             | 68%             |
| South Ayrshire      | 24%             | 76%             | 32%             | 68%             |
| Stirling            | 33%             | 68%             | 55%             | 45%             |
| West Lothian        | 36%             | 64%             | 59%             | 41%             |
| Total               | 41%             | 59%             | 58%             | 42%             |

*Table 15. Overall condition using SCM positive indicator thresholds (lost, unfavourable [U] or favourable [F]) of Annex I habitats, with numbers of stands, according to local authorities*

| Local Authority      | 6210 |    |      | 6230 |    | 6410 |    | 6520 |    |      | Total |
|----------------------|------|----|------|------|----|------|----|------|----|------|-------|
|                      | F    | U  | lost | F    | U  | F    | U  | F    | U  | lost |       |
| Aberdeenshire        |      |    |      | 1    | 1  |      |    |      | 7  |      | 9     |
| Borders              | 14   | 2  |      | 15   | 6  |      |    |      |    |      | 37    |
| Dumfries & Galloway  |      |    |      |      |    |      |    |      | 1  |      | 1     |
| East Ayrshire        |      |    |      |      | 1  |      |    |      |    |      | 1     |
| Fife                 | 5    | 4  | 1    |      |    |      |    |      |    |      | 10    |
| Highland             | 2    |    |      | 6    | 1  | 5    | 1  | 2    | 2  | 1    | 20    |
| Moray                |      |    |      | 1    | 2  |      |    |      | 1  |      | 4     |
| Stirling             |      |    |      |      |    |      |    | 1    | 2  |      | 3     |
| West Lothian         | 1    |    |      |      |    |      |    |      |    |      | 1     |
| Total                | 22   | 6  | 1    | 23   | 11 | 5    | 1  | 3    | 13 | 1    | 86    |
| % of original stands | 76   | 21 | 3    | 68   | 32 | 83   | 17 | 18   | 76 | 6    |       |
| % of existing stands | 79   | 21 | N/A  | 68   | 32 | 83   | 17 | 19   | 81 | N/A  |       |

*Table 16. Overall condition using reduced positive indicator thresholds (lost, unfavourable [U] or favourable [F]) of Annex I habitats, with numbers of stands, according to local authorities*

| Local Authority      | 6210 |    |      | 6230 |    | 6410 |   | 6520 |    |      | Total |
|----------------------|------|----|------|------|----|------|---|------|----|------|-------|
|                      | F    | U  | lost | F    | U  | F    | U | F    | U  | lost |       |
| Aberdeenshire        |      |    |      | 1    | 1  |      |   | 1    | 6  |      | 9     |
| Borders              | 14   | 2  |      | 17   | 4  |      |   |      |    |      | 37    |
| Dumfries & Galloway  |      |    |      |      |    |      |   |      | 1  |      | 1     |
| East Ayrshire        |      |    |      | 1    |    |      |   |      |    |      | 1     |
| Fife                 | 6    | 3  | 1    |      |    |      |   |      |    |      | 10    |
| Highland             | 2    |    |      | 7    |    | 6    |   | 2    | 2  | 1    | 20    |
| Moray                |      |    |      | 3    |    |      |   |      | 1  |      | 4     |
| Stirling             |      |    |      |      |    |      |   | 1    | 2  |      | 3     |
| West Lothian         | 1    |    |      |      |    |      |   |      |    |      | 1     |
| Total                | 23   | 5  | 1    | 29   | 5  | 6    |   | 4    | 12 | 1    | 86    |
| % of original stands | 79   | 17 | 3    | 85   | 15 | 100  |   | 24   | 71 | 6    |       |
| % of existing stands | 82   | 18 | N/A  | 85   | 15 | 100  |   | 25   | 75 | N/A  |       |

Table 17. Overall condition using SCM positive indicator threshold (lost [L], unfavourable [U] or favourable [F]) of BAP Priority Lowland Calcareous Grassland, Upland Hay Meadow, Lowland Hay Meadow, Lowland Dry Acid Grassland, Purple Moor-grass & Rush Pasture and total BAP Priority, with numbers of stands, according to local authorities.

| Local Authority      | LCG |    |     | UHM |    |     | LM |    |     | LDAG |    |     | PMRP |     |     | Total |
|----------------------|-----|----|-----|-----|----|-----|----|----|-----|------|----|-----|------|-----|-----|-------|
|                      | F   | U  | L   | F   | U  | L   | F  | U  | L   | F    | U  | L   | F    | U   | L   |       |
| Aberdeenshire        | 1   | 1  |     |     | 7  |     |    | 4  |     | 4    |    |     | 1    | 2   |     | 20    |
| Borders              | 29  | 8  |     |     |    |     | 6  | 5  | 1   | 33   | 17 |     | 5    | 18  |     | 122   |
| Dumfries & G.        |     |    |     |     | 1  |     | 2  | 1  | 2   | 2    | 6  | 1   | 7    | 3   | 3   | 28    |
| East Ayrshire        |     | 1  |     |     |    |     | 2  | 3  |     | 1    | 4  |     |      | 5   | 2   | 18    |
| Fife                 | 6   | 4  | 2   |     |    |     |    | 4  | 3   | 8    | 12 | 2   | 1    | 7   |     | 49    |
| Highland             | 8   | 1  |     | 2   | 2  | 1   | 12 | 17 | 14  | 7    | 6  | 7   | 7    | 29  | 6   | 119   |
| Inverclyde           |     |    |     |     |    |     |    |    |     |      | 3  |     | 1    | 5   |     | 9     |
| Moray                | 1   | 2  |     |     | 1  |     | 1  | 3  | 1   | 4    | 1  | 2   |      | 4   |     | 20    |
| North Ayrshire       | 1   |    |     |     |    |     |    |    |     | 3    | 1  |     | 4    | 6   |     | 15    |
| Renfrewshire         |     |    |     |     |    |     | 2  | 3  |     |      | 11 |     | 3    | 12  |     | 31    |
| South Ayrshire       | 2   |    | 1   |     |    |     | 1  | 5  | 4   | 2    | 3  |     | 1    | 11  |     | 30    |
| Stirling             | 2   |    |     | 1   | 2  |     |    | 5  |     | 1    | 9  |     | 9    | 11  |     | 40    |
| West Lothian         | 1   |    |     |     |    |     | 3  | 5  |     | 3    | 5  | 3   | 1    | 4   |     | 25    |
| Total                | 51  | 17 | 3   | 3   | 13 | 1   | 29 | 55 | 25  | 68   | 78 | 15  | 40   | 117 | 11  | 526   |
| % of original stands | 72  | 24 | 4   | 18  | 76 | 6   | 27 | 50 | 23  | 42   | 48 | 9   | 24   | 70  | 7   |       |
| % of existing stands | 75  | 25 | n/a | 19  | 81 | n/a | 35 | 65 | n/a | 47   | 53 | n/a | 25   | 75  | n/a |       |

Table 18. Overall condition using reduced positive indicator threshold (lost [L], unfavourable [U] or favourable [F]) of BAP Priority Lowland Calcareous Grassland, Upland Hay Meadow, Lowland Hay Meadow, Lowland Dry Acid Grassland, Purple Moor-grass & Rush Pasture and total BAP Priority, with numbers of stands, according to local authorities.

| Local Authority      | LCG |    |     | UHM |    |     | LM |    |     | LDAG |    |     | PMRP |    |     | Total |
|----------------------|-----|----|-----|-----|----|-----|----|----|-----|------|----|-----|------|----|-----|-------|
|                      | F   | U  | L   | F   | U  | L   | F  | U  | L   | F    | U  | L   | F    | U  | L   |       |
| Aberdeenshire        | 1   | 1  |     | 1   | 6  |     |    | 4  |     | 4    |    |     | 2    | 1  |     | 20    |
| Borders              | 31  | 6  |     |     |    |     | 7  | 4  | 1   | 36   | 14 |     | 8    | 15 |     | 122   |
| Dumfries & G.        |     |    |     |     | 1  |     | 3  |    | 2   | 3    | 5  | 1   | 7    | 3  | 3   | 28    |
| East Ayrshire        | 1   |    |     |     |    |     | 2  | 3  |     | 3    | 2  |     | 1    | 4  | 2   | 18    |
| Fife                 | 7   | 3  | 2   |     |    |     |    | 4  | 3   | 19   | 1  | 2   | 3    | 5  |     | 49    |
| Highland             | 9   |    |     | 2   | 2  | 1   | 17 | 12 | 14  | 9    | 4  | 7   | 17   | 19 | 6   | 119   |
| Inverclyde           |     |    |     |     |    |     |    |    |     | 2    | 1  |     | 4    | 2  |     | 9     |
| Moray                | 3   |    |     |     | 1  |     | 2  | 2  | 1   | 4    | 1  | 2   | 2    | 2  |     | 20    |
| North Ayrshire       | 1   |    |     |     |    |     |    |    |     | 3    | 1  |     | 8    | 2  |     | 15    |
| Renfrewshire         |     |    |     |     |    |     | 2  | 3  |     | 3    | 8  |     | 5    | 10 |     | 31    |
| South Ayrshire       | 2   |    | 1   |     |    |     | 1  | 5  | 4   | 2    | 3  |     | 3    | 9  |     | 30    |
| Stirling             | 2   |    |     | 1   | 2  |     | 1  | 4  |     | 4    | 6  |     | 14   | 6  |     | 40    |
| West Lothian         | 1   |    |     |     |    |     | 6  | 2  |     | 5    | 3  | 3   | 1    | 4  |     | 25    |
| Total                | 58  | 10 | 3   | 4   | 12 | 1   | 41 | 43 | 25  | 97   | 49 | 15  | 75   | 82 | 11  | 526   |
| % of original stands | 82  | 14 | 4   | 24  | 71 | 6   | 38 | 39 | 23  | 60   | 30 | 9   | 45   | 49 | 7   |       |
| % of existing stands | 85  | 15 | n/a | 25  | 75 | n/a | 49 | 51 | n/a | 66   | 34 | n/a | 48   | 52 | n/a |       |

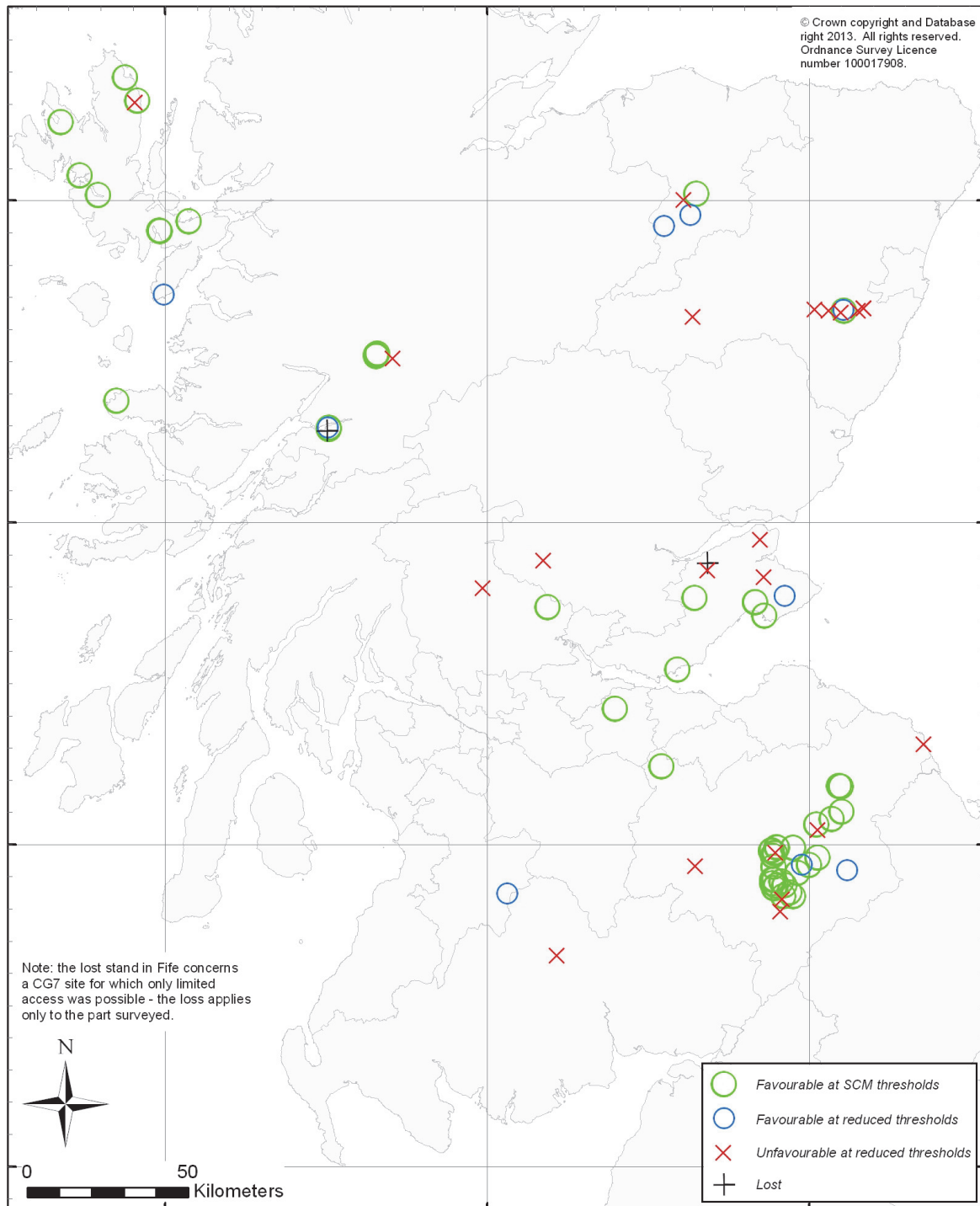


*Figure 3. Distribution and overall status of all surveyed Annex I grassland sample stands*

The obvious concentration of Annex I stands in the Borders in Figure 3 and Figure 4 is a consequence of the relative frequency in that region of calcareous grasslands qualifying as Annex I H6210 and H6230, the former absent or very rare in the rest of Scotland. Figures 5 to 13 also show overall condition but separated into individual Annex I and BAP Priority habitats.

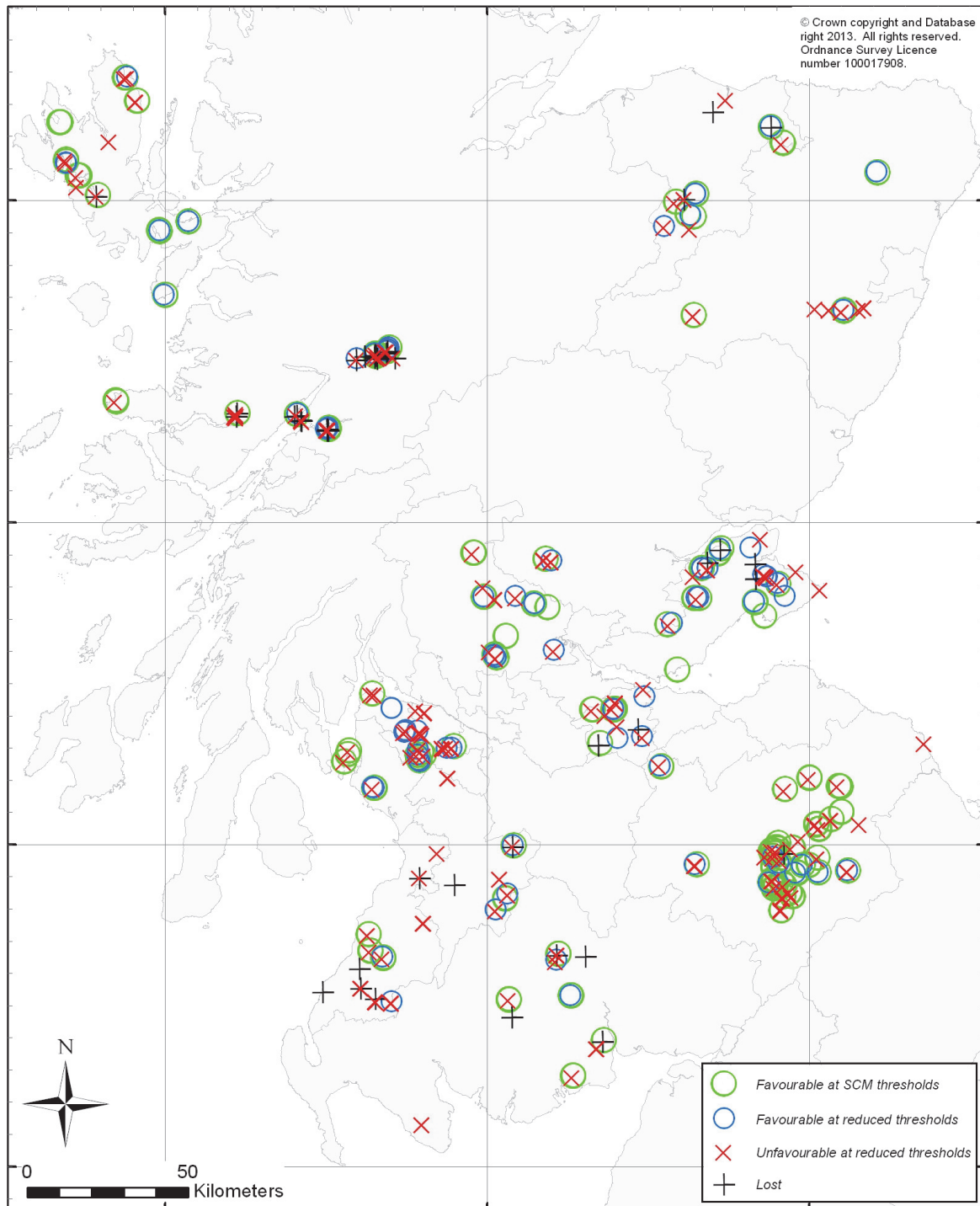


**Figure 4. Distribution and overall status of all surveyed BAP Priority grassland sample stands**

The above map also serves as a distribution map of all surveyed constituent NVC communities.

A significant contribution to the local concentration of lost BAP Priority stands in Lochaber in the above map appears to have been made by agricultural improvement of Lowland Meadow (MG5).

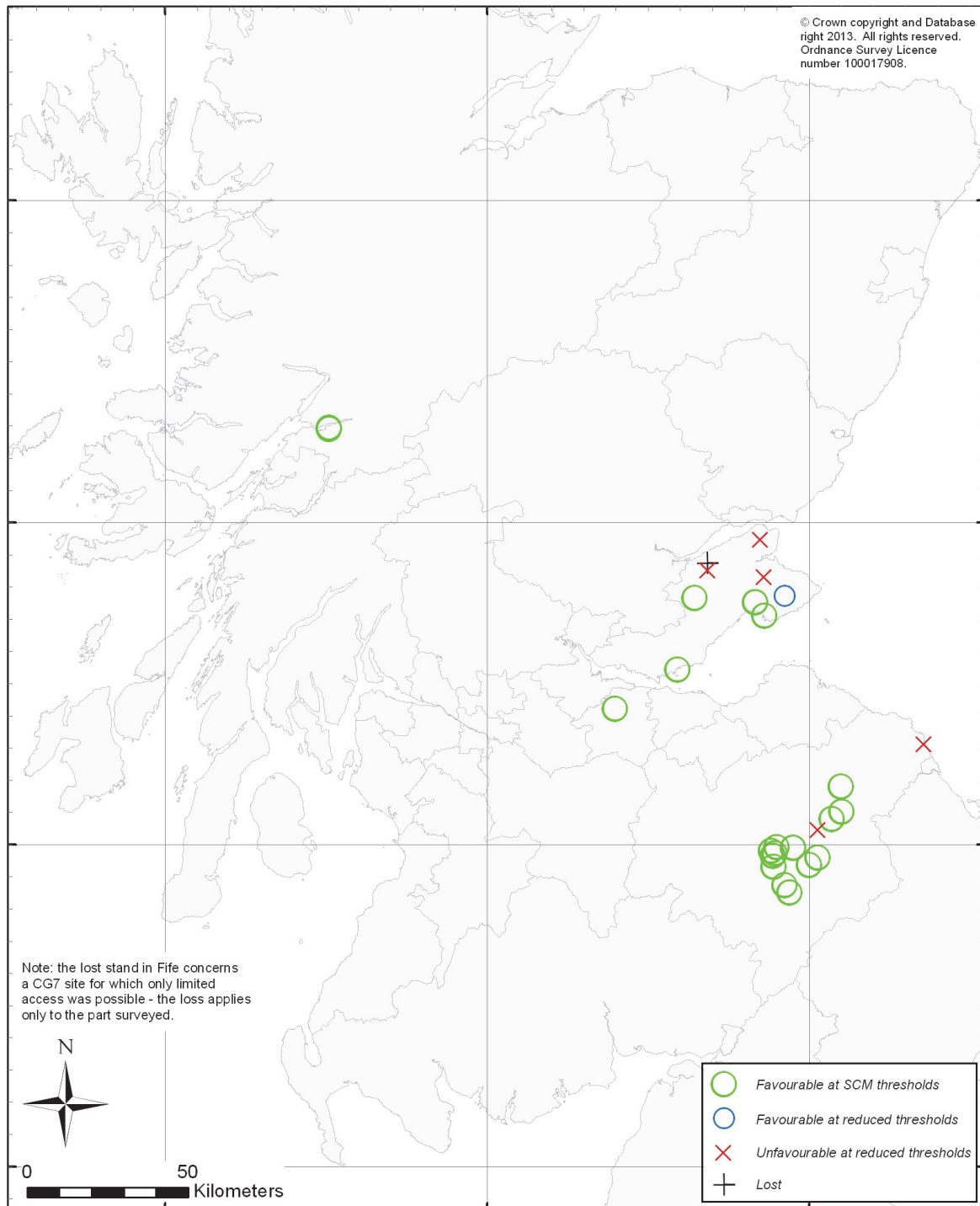


**Figure 5. Distribution and overall status of Annex I H6210 (CG1, CG2, CG7 and a small part of CG10) sample stands**

It is very clear from the above map that the Annex I H6210 calcareous grasslands in this survey are nearly all concentrated in south-east Scotland, mostly the Borders. The outlying stand in Glen Coe refers to a small stand of CG10 apparently on limestone bedrock, and therefore qualifying as Annex I H6210. Unfavourable condition is often due to under-management and consequent encroachment of scrub, rank grass or bracken.

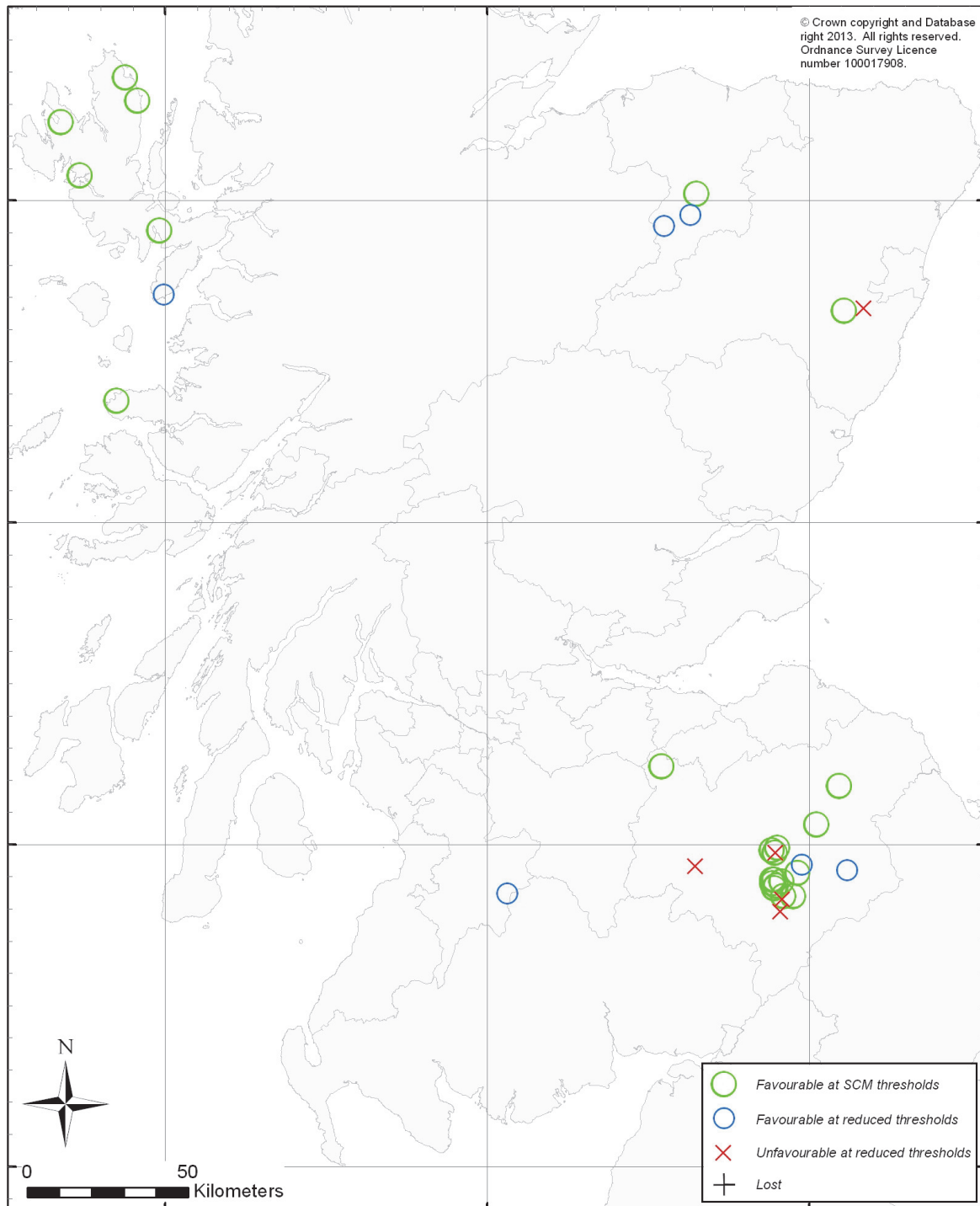


*Figure 6. Distribution and overall status of Annex I H6230 (part of CG10) sample stands*

Again, the above map demonstrates the high frequency in this survey of calcareous grasslands in south-east Scotland. The wider distribution of Annex I H6230 compared to H6210 is a consequence of the more widespread nature of qualifying CG10, the main calcareous grassland in Scotland at lower altitude. As for Annex I H6210, unfavourable condition is often due to under-management and consequent encroachment of scrub, rank grasses or bracken.

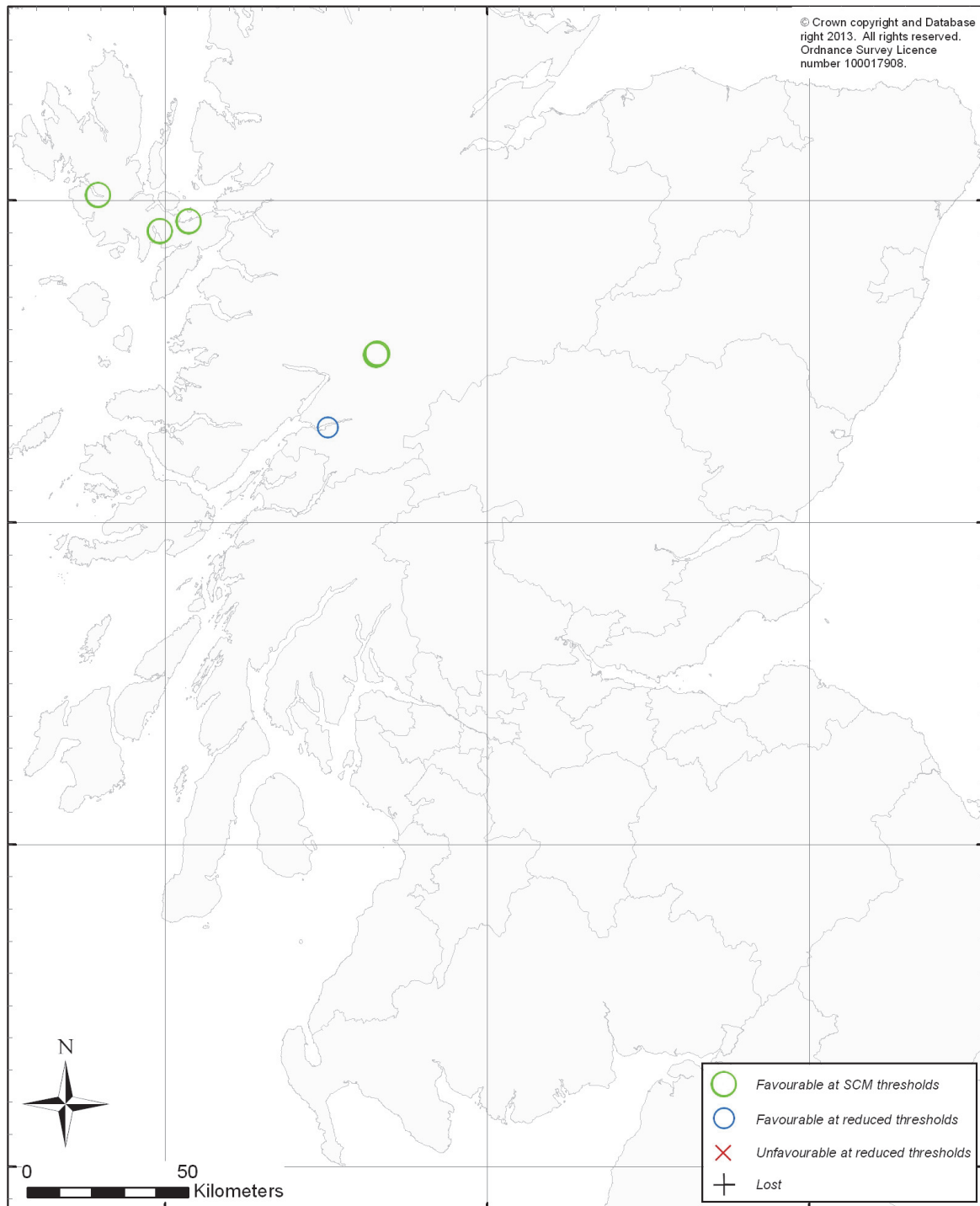


Figure 7. Distribution and overall status of Annex I H6410 (M26) sample stands

The few stands of M26 in the above map contained species such as *Trollius europaeus* and *Crepis paludosa*. However, the status of M26 in Scotland is unclear. Appendix 3 discusses this, and possible confusion with other communities such as M25c.

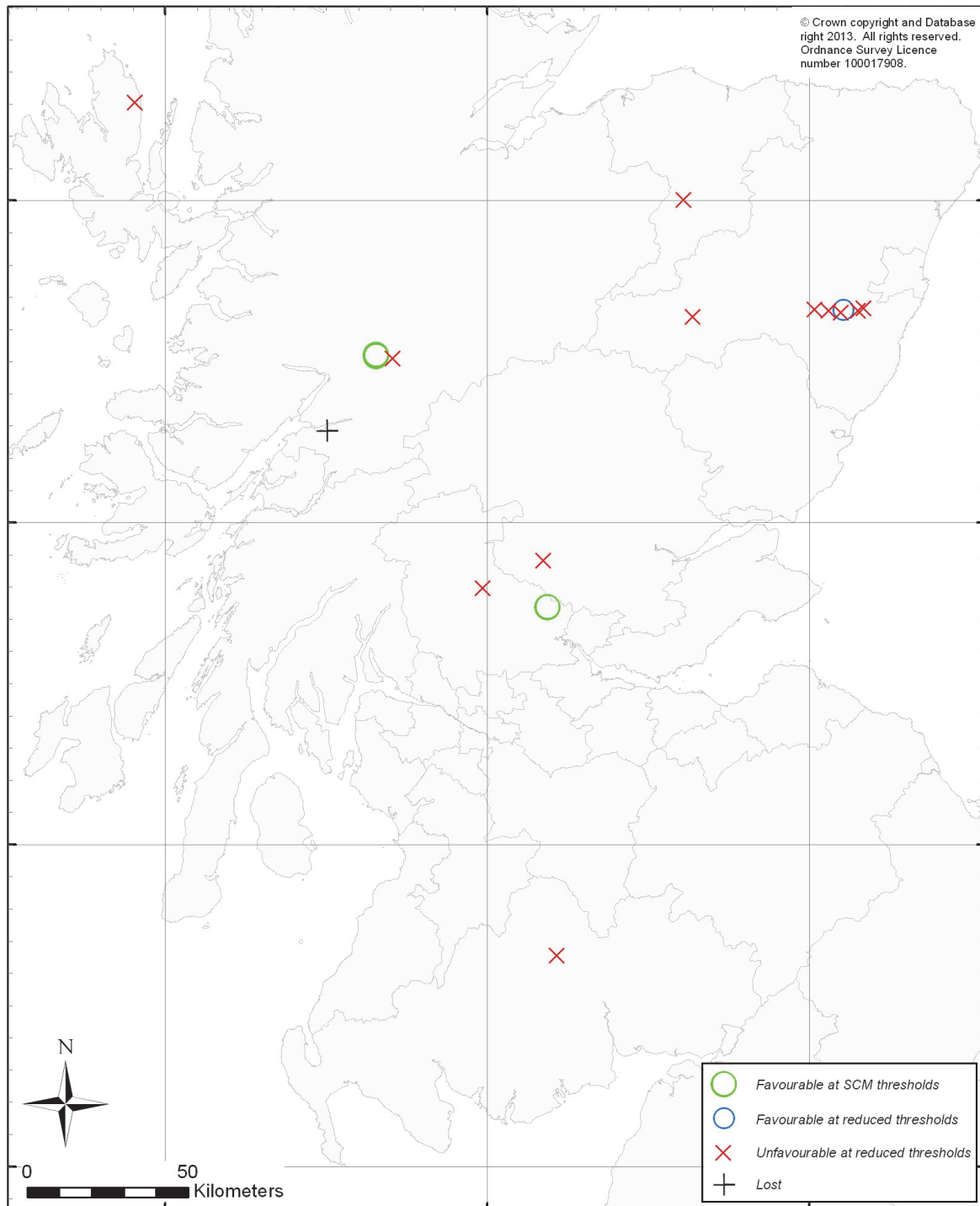


*Figure 8. Distribution and overall status of Annex I H6520 (MG3) sample stands*

The linear concentration of MG3 stands in the above map is due to a sequence of sites with MG3 along the River Dee. Unfavourable condition is generally due to overly coarse vegetation through under-management.

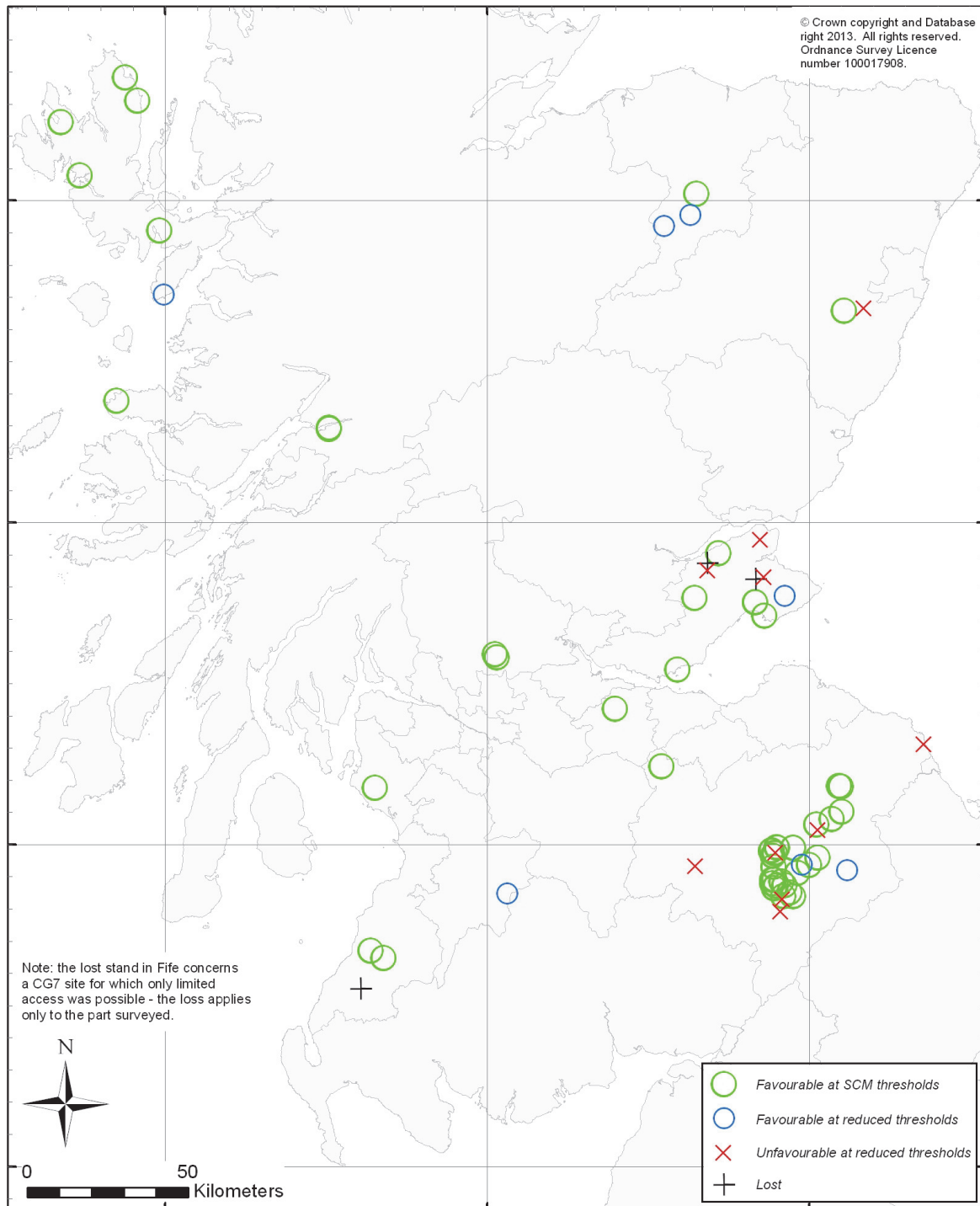


**Figure 9. Distribution and overall status of BAP Priority Lowland Calcareous Grassland (CG1, CG2, CG7 and CG10) sample stands**

As noted above, the concentration of Lowland Calcareous Grassland stands in the Borders is in part due to the frequency there of calcareous communities which are absent or rare elsewhere.

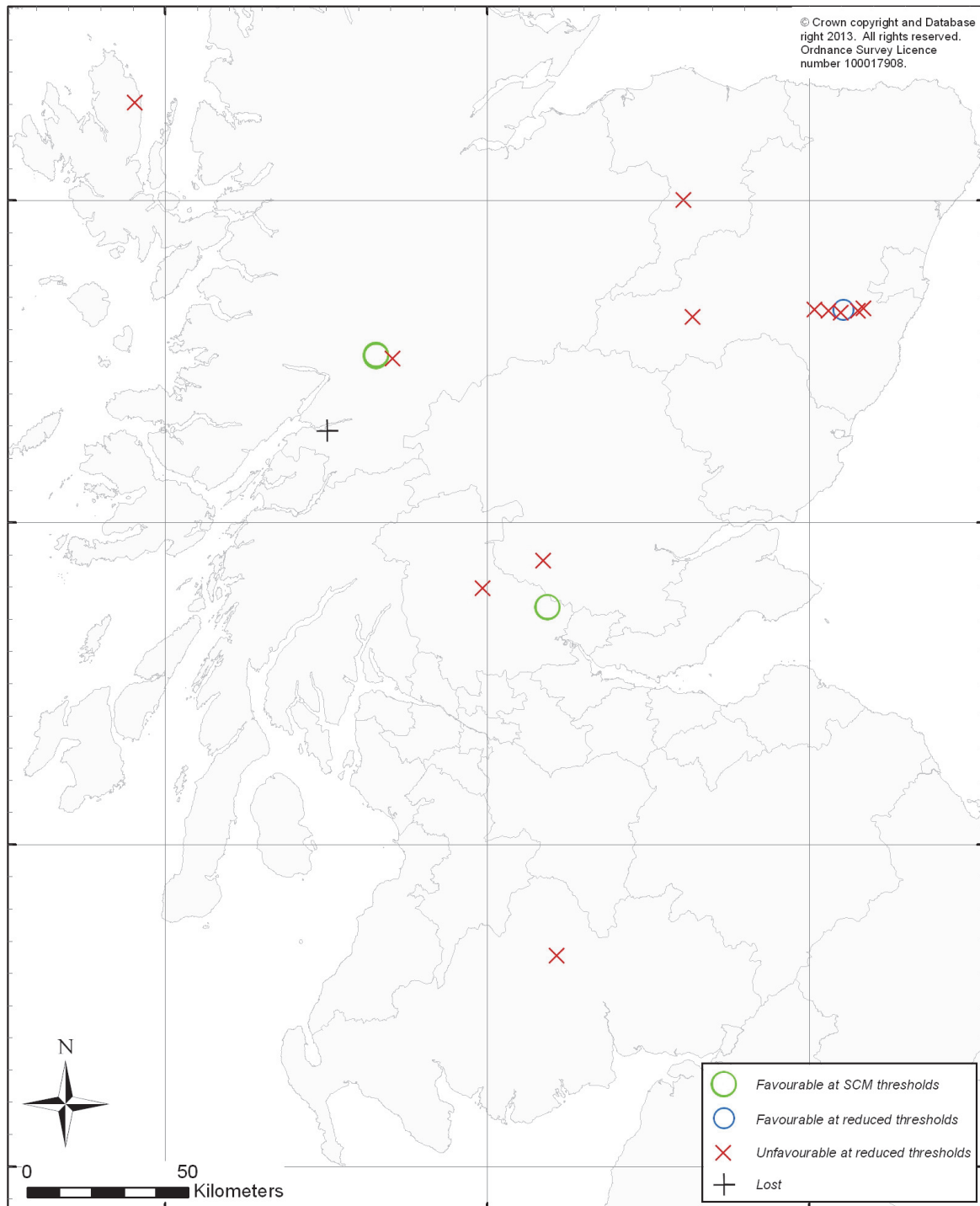


**Figure 10. Distribution and overall status of BAP Priority Upland Hay Meadow (MG3) sample stands**

The above map for Upland Hay Meadow is identical to that for Annex I H6520 because the constituent community (MG3) is the same. Lack of favourability is generally due to overly coarse vegetation through under-management.

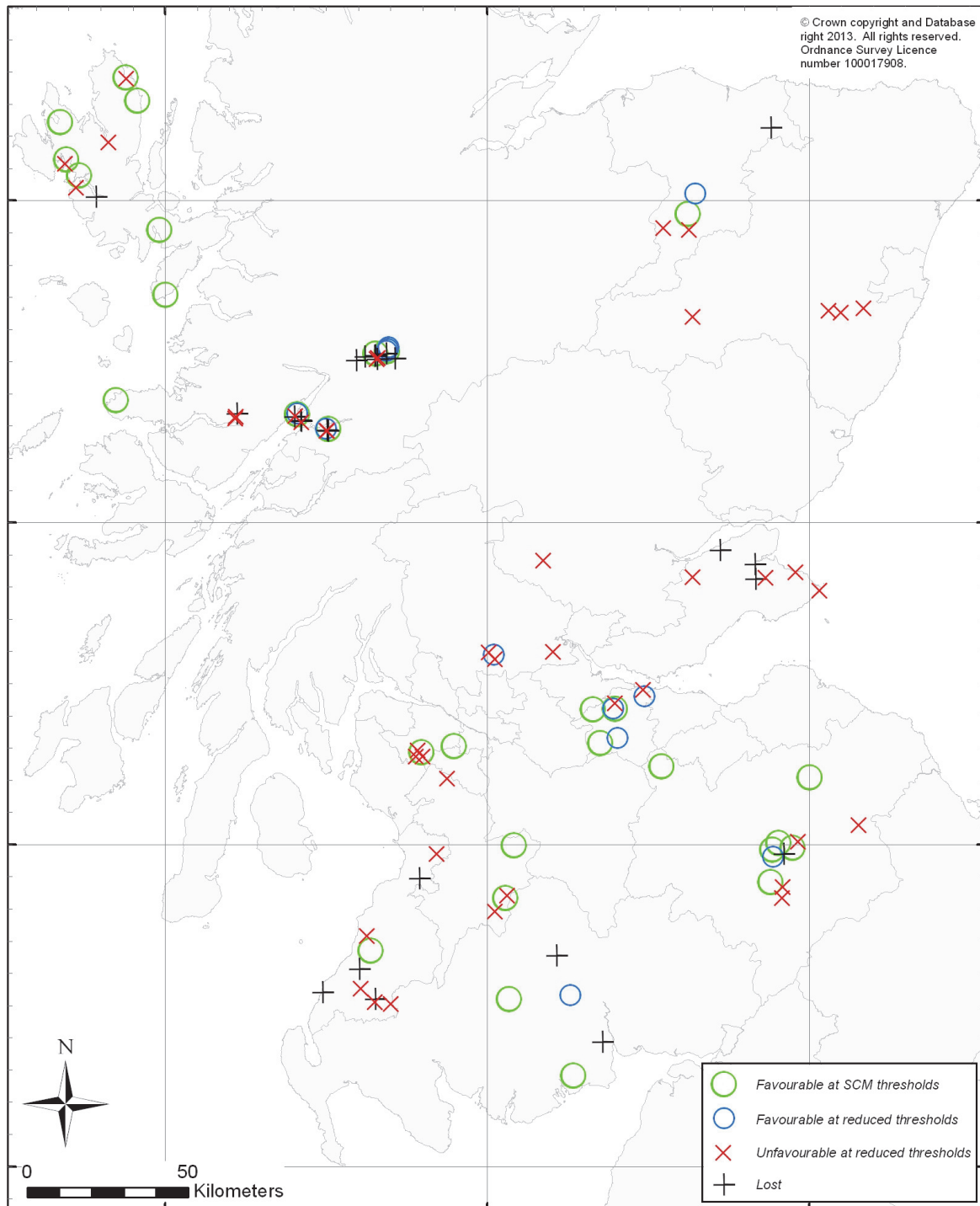


**Figure 11. Distribution and overall status of BAP Priority Lowland Meadow (MG5) sample stands**

As noted under Figure 4, a significant contribution to the local concentration of lost BAP Priority stands in the above map appears to have been made by agricultural improvement of Lowland Meadow (MG5). The frequency of unfavourable stands appears to be mainly due to a combination of agricultural intensification and under-management.

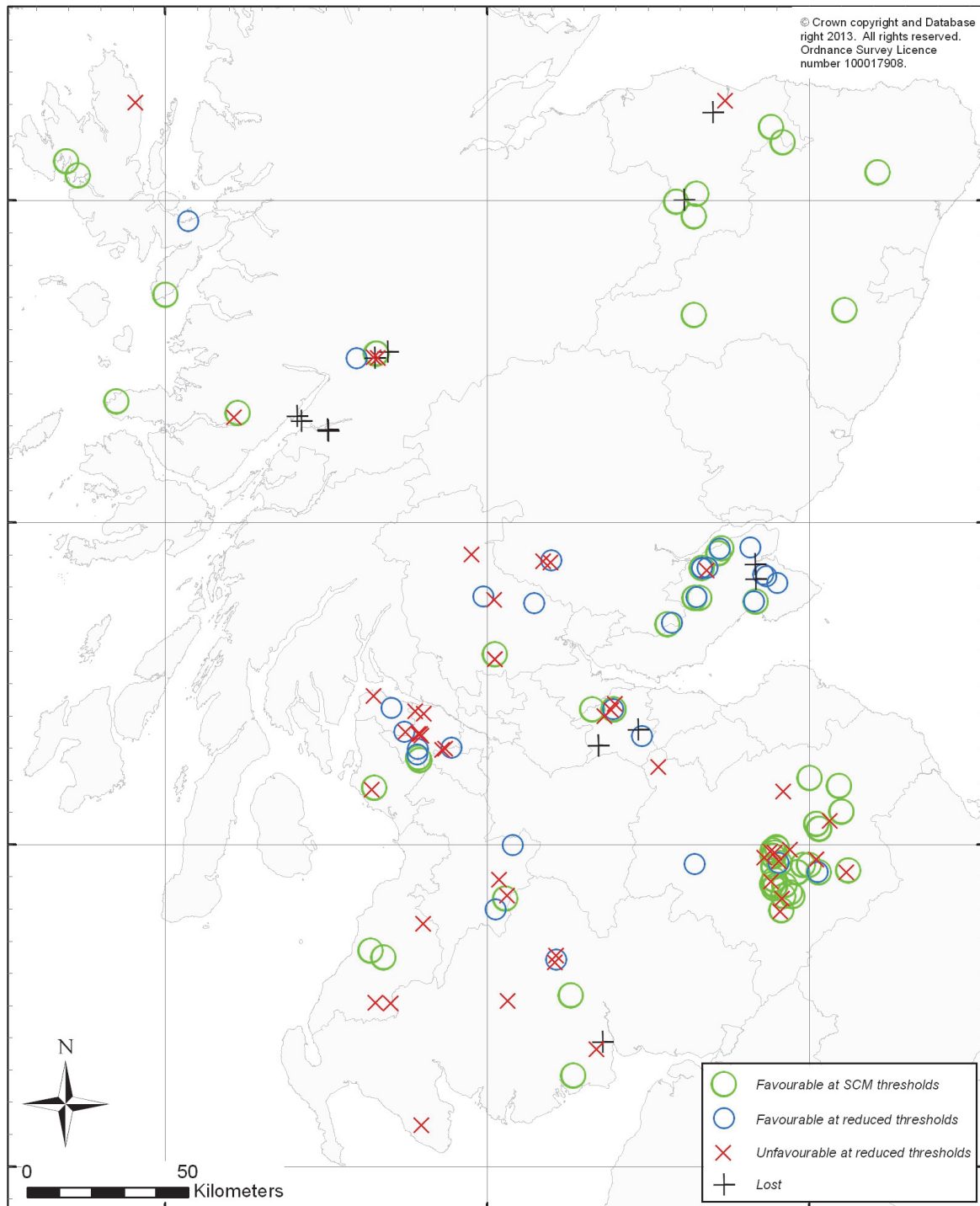


*Figure 12. Distribution and overall status of BAP Priority Lowland Dry Acid Grassland (U1 and U4) sample stands*

An obvious feature of the above map is the widespread occurrence of Lowland Dry Acid Grassland stands which are unfavourable or only favourable at the reduced positive indicator thresholds. This is due to the relative frequency of lower quality U4 (including U4b), largely through agricultural intensification and under-management.

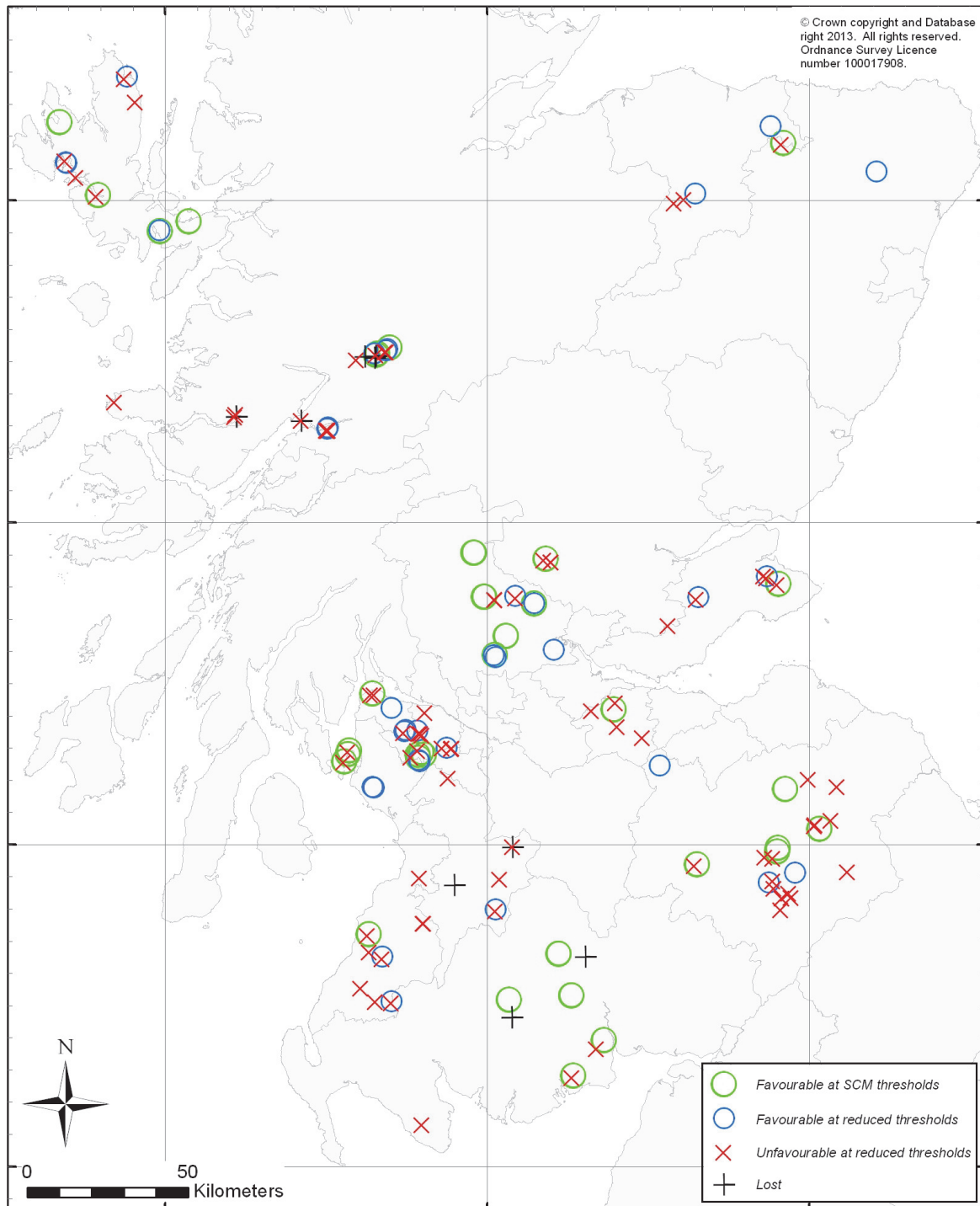


*Figure 13. Distribution and overall status of BAP Priority Purple Moor-grass and Rush Pasture (M23, M25 and M26) sample stands*

As in Figure 12, the above map has a high frequency of stands which are unfavourable or only favourable at the reduced positive indicator thresholds. This is due to the frequency of species-poor M23 and, to a lesser extent, M25, often through under-management (though many of these stands, particularly of M23, are at sites whose interest is dry grasslands).

### 3.3.2 *Positive indicators attribute*

Positive indicators were assessed at two levels: the normal SSSI-standard SCM thresholds and the reduced thresholds more appropriate for non-SSSI sites (see Methodology). Table 19 through to Table 23 summarise the positive indicators attribute at both levels for Annex I and BAP Priority habitats (data for constituent NVC communities are given in Appendix 2). Figure 14 and Figure 15 below similarly provide maps of this attribute for Annex I and BAP Priority habitats respectively. For all existing surveyed stands (i.e. excluding lost stands from percentage calculations), 48% of all constituent NVC stands are favourable for positive indicators at the SCM thresholds, this figure rising to 71% for the reduced thresholds. Of those stands which pass the SCM positive indicator threshold, 16% still fail overall; for those stands which only pass the reduced threshold 18% still fail overall. These discrepancies, reflected in the overall favourability of 58% of stands even using the reduced positive indicator thresholds (see 'Overall Condition' above), are largely due to unfavourable negative indicators, although for seven sites (all MG5 or MG3) both positive and negative indicators were actually satisfactory and it was a poor grass:forb ratio that resulted in unfavourable condition.

The existing surveyed stands (i.e. excluding lost stands) of Annex I habitats were mostly favourable for positive indicators at the SCM positive indicator thresholds: H6210 (CG1, 2, 7, and a small part of CG10) was 89% favourable (93% at reduced thresholds); H6230 (part of CG10) was 79% favourable (97% at reduced thresholds); H6410 (M26) was 83% favourable (100% at reduced thresholds); and, fairing noticeably less well at SCM thresholds, H6520 (MG3) was only 25% favourable (but 75% at reduced thresholds).

The percentage of BAP Priority habitats in favourable condition for the SCM positive indicator species attribute was similarly very high for Lowland Calcareous Grassland (85%), reflecting the favourable condition of the majority of the surveyed calcareous communities. Upland Hay Meadow, being the same as Annex I H6520, is also mostly unfavourable (25%) for positive indicators. Purple Moor-grass & Rush Pasture is also mostly unfavourable (27%). This latter figure combines the 100% favourable condition of M26 with the mostly unfavourable condition of M23 and M25, especially the former (18% and 43% respectively). Lowland Meadow (mainly MG5) and Lowland Dry Acid Grassland (U1,U4) are of intermediate favourability (46% and 58% respectively); the latter is mostly due to the unfavourable condition of some U4 (53%).

Looking at the reduced positive indicator thresholds in Annex I habitats, the most notable difference from SCM thresholds is again the much better performance of MG3, representing Upland Hay Meadow, at 75% favourable. Lowland Calcareous Grassland achieves nearly 100% favourability at the reduced threshold. The pass rates of the other three BAP Priority habitats are higher than the SCM pass rates by about half (Lowland Meadow 74%; Lowland Dry Acid Grassland 80%; Purple Moor-grass & Rush Pasture 50%). Lowland Meadow is mostly MG5 but includes one MG8 stand which was unfavourable for this attribute. The relatively poor performance of Purple Moor-grass & Rush Pasture is again heavily affected by the low proportion of M23 in favourable condition (45%).

From a geographical perspective the percentage of stands in favourable condition for positive indicator species at SCM thresholds was noticeably high in the Borders (74%) and North Ayrshire (67%), and noticeably low in Inverclyde (11%), East Ayrshire (25%), Renfrewshire (26%) and South Ayrshire (28%). At the reduced positive indicator thresholds, all regions have higher pass rates and all exceed 60% with the exception of South Ayrshire (36%) and Renfrewshire (52%).

Table 19. Positive indicators attribute at SCM thresholds (lost, unfavourable [U], and favourable [F]) for Annex I habitats, with numbers of stands, according to local authorities.

| Local Authority      | 6210 |    |      | 6230 |    | 6410 |    | 6520 |    |      | Total |
|----------------------|------|----|------|------|----|------|----|------|----|------|-------|
|                      | F    | U  | lost | F    | U  | F    | U  | F    | U  | lost |       |
| Aberdeenshire        |      |    |      | 1    | 1  |      |    | 1    | 6  |      | 9     |
| Borders              | 16   |    |      | 19   | 2  |      |    |      |    |      | 37    |
| Dumfries & Galloway  |      |    |      |      |    |      |    |      | 1  |      | 1     |
| East Ayrshire        |      |    |      |      | 1  |      |    |      |    |      | 1     |
| Fife                 | 6    | 3  | 1    |      |    |      |    |      |    |      | 10    |
| Highland             | 2    |    |      | 6    | 1  | 5    | 1  | 2    | 2  | 1    | 20    |
| Moray                |      |    |      | 1    | 2  |      |    |      | 1  |      | 4     |
| Stirling             |      |    |      |      |    |      |    | 1    | 2  |      | 3     |
| West Lothian         | 1    |    |      |      |    |      |    |      |    |      | 1     |
| Grand Total          | 25   | 3  | 1    | 27   | 7  | 5    | 1  | 4    | 12 | 1    | 86    |
| % of original stands | 86   | 10 | 3    | 79   | 21 | 83   | 17 | 24   | 71 | 6    |       |
| % of existing stands | 89   | 11 | n/a  | 79   | 21 | 83   | 17 | 25   | 75 | n/a  |       |

Table 20. Positive indicators attribute at reduced thresholds (lost, unfavourable [U], and favourable [F]) for Annex I habitats, with numbers of stands, according to local authorities.

| Local Authority      | 6210 |   |      | 6230 |   | 6410 | 6520 |    |      | Total |
|----------------------|------|---|------|------|---|------|------|----|------|-------|
|                      | F    | U | lost | F    | U | F    | F    | U  | lost |       |
| Aberdeenshire        |      |   |      | 1    | 1 |      | 7    |    |      | 9     |
| Borders              | 16   |   |      | 21   |   |      |      |    |      | 37    |
| Dumfries & Galloway  |      |   |      |      |   |      | 1    |    |      | 1     |
| East Ayrshire        |      |   |      | 1    |   |      |      |    |      | 1     |
| Fife                 | 7    | 2 | 1    |      |   |      |      |    |      | 10    |
| Highland             | 2    |   |      | 7    |   | 6    | 2    | 2  | 1    | 20    |
| Moray                |      |   |      | 3    |   |      |      | 1  |      | 4     |
| Stirling             |      |   |      |      |   |      | 2    | 1  |      | 3     |
| West Lothian         | 1    |   |      |      |   |      |      |    |      | 1     |
| Total                | 26   | 2 | 1    | 33   | 1 | 6    | 12   | 4  | 1    | 86    |
| % of original stands | 90   | 7 | 3    | 97   | 3 | 100  | 71   | 24 | 6    |       |
| % of existing stands | 93   | 7 | n/a  | 97   | 3 | 100  | 75   | 25 | n/a  |       |

Table 21. Positive indicators attribute at SCM thresholds (lost [L], unfavourable [U], and favourable [F]) for BAP Priority habitats, with numbers of stands, according to local authorities.

| Local Authority      | LCG |    |     | UHM |    |     | LM |    |     | LDAG |    |     | PMRP |     |     | Total |
|----------------------|-----|----|-----|-----|----|-----|----|----|-----|------|----|-----|------|-----|-----|-------|
|                      | F   | U  | L   | F   | U  | L   | F  | U  | L   | F    | U  | L   | F    | U   | L   |       |
| Aberdeenshire        | 1   | 1  |     | 1   | 6  |     | 1  | 3  |     | 4    |    |     | 1    | 2   |     | 20    |
| Borders              | 35  | 2  |     |     |    |     | 6  | 5  | 1   | 44   | 6  |     | 5    | 18  |     | 122   |
| Dumfries & G.        |     |    |     |     | 1  |     | 2  | 1  | 2   | 2    | 6  | 1   | 7    | 3   | 3   | 28    |
| East Ayrshire        |     | 1  |     |     |    |     | 2  | 3  |     | 2    | 3  |     |      | 5   | 2   | 18    |
| Fife                 | 7   | 3  | 2   |     |    |     | 1  | 3  | 3   | 8    | 12 | 2   | 1    | 7   |     | 49    |
| Highland             | 8   | 1  |     | 2   | 2  | 1   | 14 | 15 | 14  | 8    | 5  | 7   | 7    | 29  | 6   | 119   |
| Inverclyde           |     |    |     |     |    |     |    |    |     |      | 3  |     | 1    | 5   |     | 9     |
| Moray                | 1   | 2  |     |     | 1  |     | 2  | 2  | 1   | 4    | 1  | 2   |      | 4   |     | 20    |
| North Ayrshire       | 1   |    |     |     |    |     |    |    |     | 3    | 1  |     | 6    | 4   |     | 15    |
| Renfrewshire         |     |    |     |     |    |     | 4  | 1  |     | 1    | 10 |     | 3    | 12  |     | 31    |
| South Ayrshire       | 2   |    | 1   |     |    |     | 2  | 4  | 4   | 2    | 3  |     | 1    | 11  |     | 30    |
| Stirling             | 2   |    |     | 1   | 2  |     | 1  | 4  |     | 3    | 7  |     | 9    | 11  |     | 40    |
| West Lothian         | 1   |    |     |     |    |     | 4  | 4  |     | 3    | 5  | 3   | 1    | 4   |     | 25    |
| Total                | 58  | 10 | 3   | 4   | 12 | 1   | 39 | 45 | 25  | 84   | 62 | 15  | 42   | 115 | 11  | 526   |
| % of original stands | 82  | 14 | 4   | 24  | 71 | 6   | 36 | 41 | 23  | 52   | 39 | 9   | 25   | 68  | 7   |       |
| % of existing stands | 85  | 15 | n/a | 25  | 75 | n/a | 46 | 54 | n/a | 58   | 42 | n/a | 27   | 73  | n/a |       |

Table 22. Positive indicators attribute at reduced thresholds (lost [L], unfavourable [U], and favourable [F]) for BAP Priority habitats, with numbers of stands, according to local authorities.

| Local Authority      | LCG |   |     | UHM |    |     | LM |    |     | LDAG |    |     | PMRP |    |     | Total |
|----------------------|-----|---|-----|-----|----|-----|----|----|-----|------|----|-----|------|----|-----|-------|
|                      | F   | U | L   | F   | U  | L   | F  | U  | L   | F    | U  | L   | F    | U  | L   |       |
| Aberdeenshire        | 1   | 1 |     | 7   |    |     | 3  | 1  |     | 4    |    |     | 2    | 1  |     | 20    |
| Borders              | 37  |   |     |     |    |     | 9  | 2  | 1   | 48   | 2  |     | 8    | 15 |     | 122   |
| Dumfries & G.        |     |   |     | 1   |    |     | 3  |    | 2   | 3    | 5  | 1   | 7    | 3  | 3   | 28    |
| East Ayrshire        | 1   |   |     |     |    |     | 3  | 2  |     | 4    | 1  |     | 1    | 4  | 2   | 18    |
| Fife                 | 8   | 2 | 2   |     |    |     | 2  | 2  | 3   | 19   | 1  | 2   | 3    | 5  |     | 49    |
| Highland             | 9   |   |     | 2   | 2  | 1   | 21 | 8  | 14  | 10   | 3  | 7   | 17   | 19 | 6   | 119   |
| Inverclyde           |     |   |     |     |    |     |    |    |     | 3    |    |     | 4    | 2  |     | 9     |
| Moray                | 3   |   |     |     | 1  |     | 3  | 1  | 1   | 4    | 1  | 2   | 2    | 2  |     | 20    |
| North Ayrshire       | 1   |   |     |     |    |     |    |    |     | 3    | 1  |     | 10   |    |     | 15    |
| Renfrewshire         |     |   |     |     |    |     | 5  |    |     | 5    | 6  |     | 6    | 9  |     | 31    |
| South Ayrshire       | 2   |   | 1   |     |    |     | 2  | 4  | 4   | 2    | 3  |     | 3    | 9  |     | 30    |
| Stirling             | 2   |   |     | 2   | 1  |     | 4  | 1  |     | 7    | 3  |     | 15   | 5  |     | 40    |
| West Lothian         | 1   |   |     |     |    |     | 7  | 1  |     | 5    | 3  | 3   | 1    | 4  |     | 25    |
| Total                | 65  | 3 | 3   | 12  | 4  | 1   | 62 | 22 | 25  | 117  | 29 | 15  | 79   | 78 | 11  | 526   |
| % of original stands | 92  | 4 | 4   | 71  | 24 | 6   | 57 | 20 | 23  | 73   | 18 | 9   | 47   | 46 | 7   |       |
| % of existing stands | 96  | 4 | n/a | 75  | 25 | n/a | 74 | 26 | n/a | 80   | 20 | n/a | 50   | 50 | n/a |       |

*Table 23. Positive indicators attribute (unfavourable, favourable at SCM threshold or favourable at reduced threshold) for all existing assessed stands, with percentages, according to local authorities. Stands which are favourable at the SCM threshold clearly also pass at the lower reduced threshold, so percentages of the latter include the former.*

| <b>Local Authority</b> | <b>Favourable<br/>(SCM)</b> | <b>Favourable<br/>(reduced)</b> | <b>Unfavourable</b> |
|------------------------|-----------------------------|---------------------------------|---------------------|
| Aberdeenshire          | 40%                         | 85%                             | 15%                 |
| Borders                | 74%                         | 84%                             | 16%                 |
| Dumfries & Galloway    | 50%                         | 64%                             | 36%                 |
| East Ayrshire          | 25%                         | 56%                             | 44%                 |
| Fife                   | 40%                         | 76%                             | 24%                 |
| Highland               | 43%                         | 65%                             | 35%                 |
| Inverclyde             | 11%                         | 78%                             | 22%                 |
| Moray                  | 41%                         | 71%                             | 29%                 |
| North Ayrshire         | 67%                         | 93%                             | 7%                  |
| Renfrewshire           | 26%                         | 52%                             | 48%                 |
| South Ayrshire         | 28%                         | 36%                             | 64%                 |
| Stirling               | 40%                         | 75%                             | 25%                 |
| West Lothian           | 41%                         | 64%                             | 36%                 |
| <b>Total</b>           | <b>48%</b>                  | <b>71%</b>                      | <b>29%</b>          |

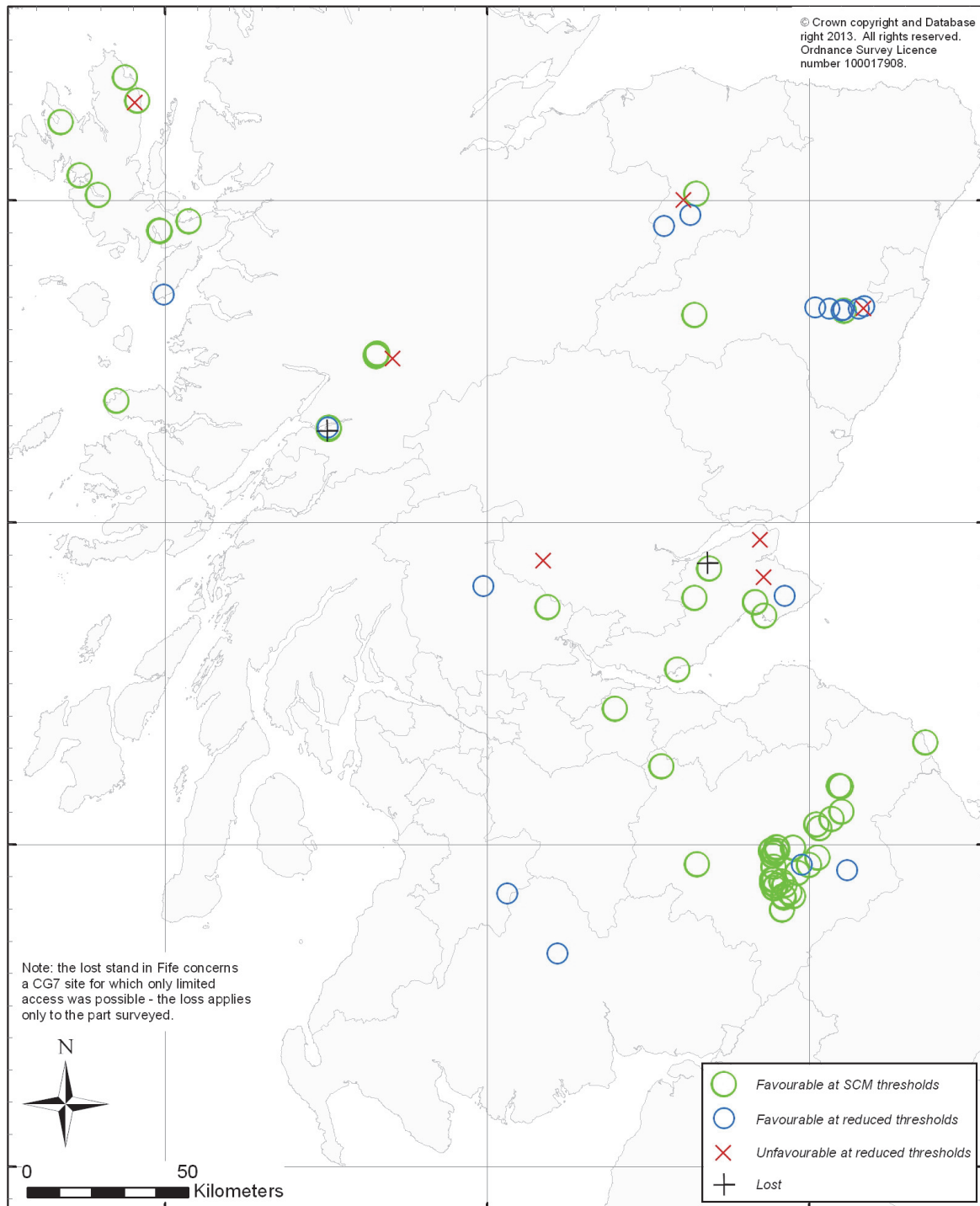


**Figure 14.** Status of positive indicators attribute for surveyed Annex I grassland sample stands

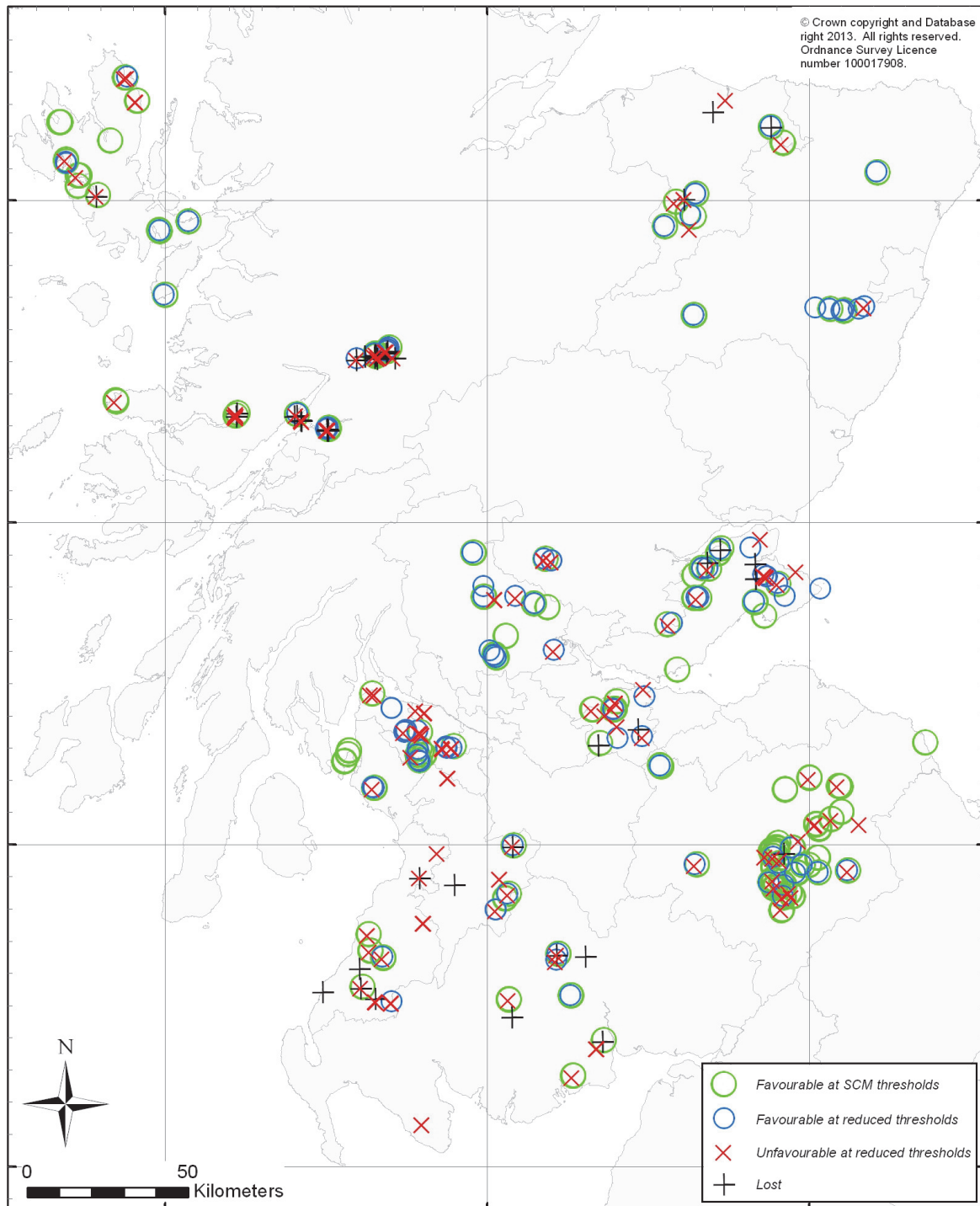


*Figure 15. Status of positive indicators attribute for surveyed BAP Priority grassland sample stands*

### 3.3.3 Negative indicators attribute

Figures 16 and 17 below show the favourability of this attribute for Annex I and BAP Priority habitats respectively. In 82% of constituent NVC stands as a whole, negative indicator species were found to be sufficiently scarce to allow the habitat to be classed as favourable for this attribute. Percentages of sites judged to be favourable and unfavourable (excluding lost stands) for the various local authority areas are given in Table 26.

For Annex I habitats, pass rates amongst the existing assessed constituent communities were high for H6210, H6230 and H6410 (86%, 85% and 100% respectively), but very much lower for H6520 (MG3) at 38%. The numbers of stands contributing to these percentages are shown in Table 24.

For BAP Priority habitats, the pass rate for Upland Hay Meadow was the same as Annex I H6520 (38%) since it comprises the same community. The existing assessed communities comprising the other BAP Priority habitats had high pass rates for negative indicators: Lowland Calcareous Grassland 87%; Lowland Meadow 69%; Lowland Dry Acid Grassland 79%; and Purple Moor-grass & Rush Pasture 95%. The numbers of stands contributing to these percentages are shown in Table 25.

Data for separate constituent NVC communities are given in Appendix 2. The percentage of constituent NVC stands favourable for negative indicators was correspondingly lowest for MG3 (38%). Whilst the other NVC communities had high pass rates for negative indicators in line with the results for Annex I and BAP Priority habitats, it is notable that CG2 and M26 were 100% favourable for this attribute, suggesting that all assessed examples were of high quality. MG8 is also 100% favourable for negative indicators but only one stand was found during the surveys, and it was unfavourable for positive indicators.

From a geographical perspective the percentage of stands in favourable condition for this attribute exceeded 80% for all surveyed local authority areas except for Aberdeenshire (55%), Renfrewshire (68%) and Stirling (73%) (Table 26).

Whilst most stands with a favourable SCM positive indicators attribute were also favourable overall, a small proportion (15%) were unfavourable overall because of unfavourable negative indicators.

Negative indicators are the main reason that stands which are favourable at the reduced (or SCM) positive indicator threshold still fail overall. About 16% of stands which are favourable at the reduced positive indicator threshold still fail overall for this reason, and about 15% of the stands favourable at the SCM positive indicator threshold.

*Table 24. Negative indicators attribute (lost, unfavourable [U] or favourable [F] of Annex I habitats, with numbers of stands, according to local authorities.*

| Local Authority      | 6210 |    |      | 6230 |    | 6410 | 6520 |    |      | Total |
|----------------------|------|----|------|------|----|------|------|----|------|-------|
|                      | F    | U  | lost | F    | U  | F    | F    | U  | lost |       |
| Aberdeenshire        |      |    |      | 1    | 1  |      | 2    | 5  |      | 9     |
| Borders              | 14   | 2  |      | 17   | 4  |      |      |    |      | 37    |
| Dumfries & Galloway  |      |    |      |      |    |      |      | 1  |      | 1     |
| East Ayrshire        |      |    |      | 1    |    |      |      |    |      | 1     |
| Fife                 | 7    | 2  | 1    |      |    |      |      |    |      | 10    |
| Highland             | 2    |    |      | 7    |    | 6    | 3    | 1  | 1    | 20    |
| Moray                |      |    |      | 3    |    |      |      | 1  |      | 4     |
| Stirling             |      |    |      |      |    |      | 1    | 2  |      | 3     |
| West Lothian         | 1    |    |      |      |    |      |      |    |      | 1     |
| Total                | 24   | 4  | 1    | 29   | 5  | 6    | 6    | 10 | 1    | 86    |
| % of original stands | 83   | 14 | 3    | 85   | 15 | 100  | 35   | 59 | 6    |       |
| % of existing stands | 86   | 14 | n/a  | 85   | 15 | 100  | 38   | 63 | n/a  |       |

Table 25. Negative indicators attribute (lost [L], unfavourable [U] or favourable [F]) of BAP Priority habitats, with numbers of stands, according to local authorities

| Local Authority      | LCG |    |     | UHM |    |     | LM |    |     | LDAG |    |     | PMRP |   |     | Total |
|----------------------|-----|----|-----|-----|----|-----|----|----|-----|------|----|-----|------|---|-----|-------|
|                      | F   | U  | L   | F   | U  | L   | F  | U  | L   | F    | U  | L   | F    | U | L   |       |
| Aberdeenshire        | 1   | 1  |     | 2   | 5  |     | 1  | 3  |     | 4    |    |     | 3    |   |     | 20    |
| Borders              | 31  | 6  |     |     |    |     | 9  | 2  | 1   | 37   | 13 |     | 23   |   |     | 122   |
| Dumfries & G.        |     |    |     |     | 1  |     | 3  |    | 2   | 8    |    | 1   | 10   |   | 3   | 28    |
| East Ayrshire        | 1   |    |     |     |    |     | 4  | 1  |     | 4    | 1  |     | 5    |   | 2   | 18    |
| Fife                 | 8   | 2  | 2   |     |    |     | 1  | 3  | 3   | 20   |    | 2   | 8    |   |     | 49    |
| Highland             | 9   |    |     | 3   | 1  | 1   | 23 | 6  | 14  | 11   | 2  | 7   | 34   | 2 | 6   | 119   |
| Inverclyde           |     |    |     |     |    |     |    |    |     | 2    | 1  |     | 6    |   |     | 9     |
| Moray                | 3   |    |     |     | 1  |     | 3  | 1  | 1   | 4    | 1  | 2   | 4    |   |     | 20    |
| North Ayrshire       | 1   |    |     |     |    |     |    |    |     | 4    |    |     | 8    | 2 |     | 15    |
| Renfrewshire         |     |    |     |     |    |     | 3  | 2  |     | 5    | 6  |     | 13   | 2 |     | 31    |
| South Ayrshire       | 2   |    | 1   |     |    |     | 4  | 2  | 4   | 4    | 1  |     | 11   | 1 |     | 30    |
| Stirling             | 2   |    |     | 1   | 2  |     | 1  | 4  |     | 6    | 4  |     | 19   | 1 |     | 40    |
| West Lothian         | 1   |    |     |     |    |     | 6  | 2  |     | 7    | 1  | 3   | 5    |   |     | 25    |
| Total                | 59  | 9  | 3   | 6   | 10 | 1   | 58 | 26 | 25  | 116  | 30 | 15  | 149  | 8 | 11  | 526   |
| % of original stands | 83  | 13 | 4   | 35  | 59 | 6   | 53 | 24 | 23  | 72   | 19 | 9   | 89   | 5 | 7   |       |
| % of existing stands | 87  | 13 | n/a | 38  | 63 | n/a | 69 | 31 | n/a | 79   | 21 | n/a | 95   | 5 | n/a |       |

Table 26. Negative indicators attribute (unfavourable or favourable) for all existing assessed stands, with percentages, according to local authorities

| Local Authority     | Favourable | Unfavourable |
|---------------------|------------|--------------|
| Aberdeenshire       | 55%        | 45%          |
| Borders             | 83%        | 17%          |
| Dumfries & Galloway | 95%        | 5%           |
| East Ayrshire       | 88%        | 13%          |
| Fife                | 88%        | 12%          |
| Highland            | 88%        | 12%          |
| Inverclyde          | 89%        | 11%          |
| Moray               | 82%        | 18%          |
| North Ayrshire      | 87%        | 13%          |
| Renfrewshire        | 68%        | 32%          |
| South Ayrshire      | 84%        | 16%          |
| Stirling            | 73%        | 28%          |
| West Lothian        | 86%        | 14%          |
| Total               | 82%        | 18%          |

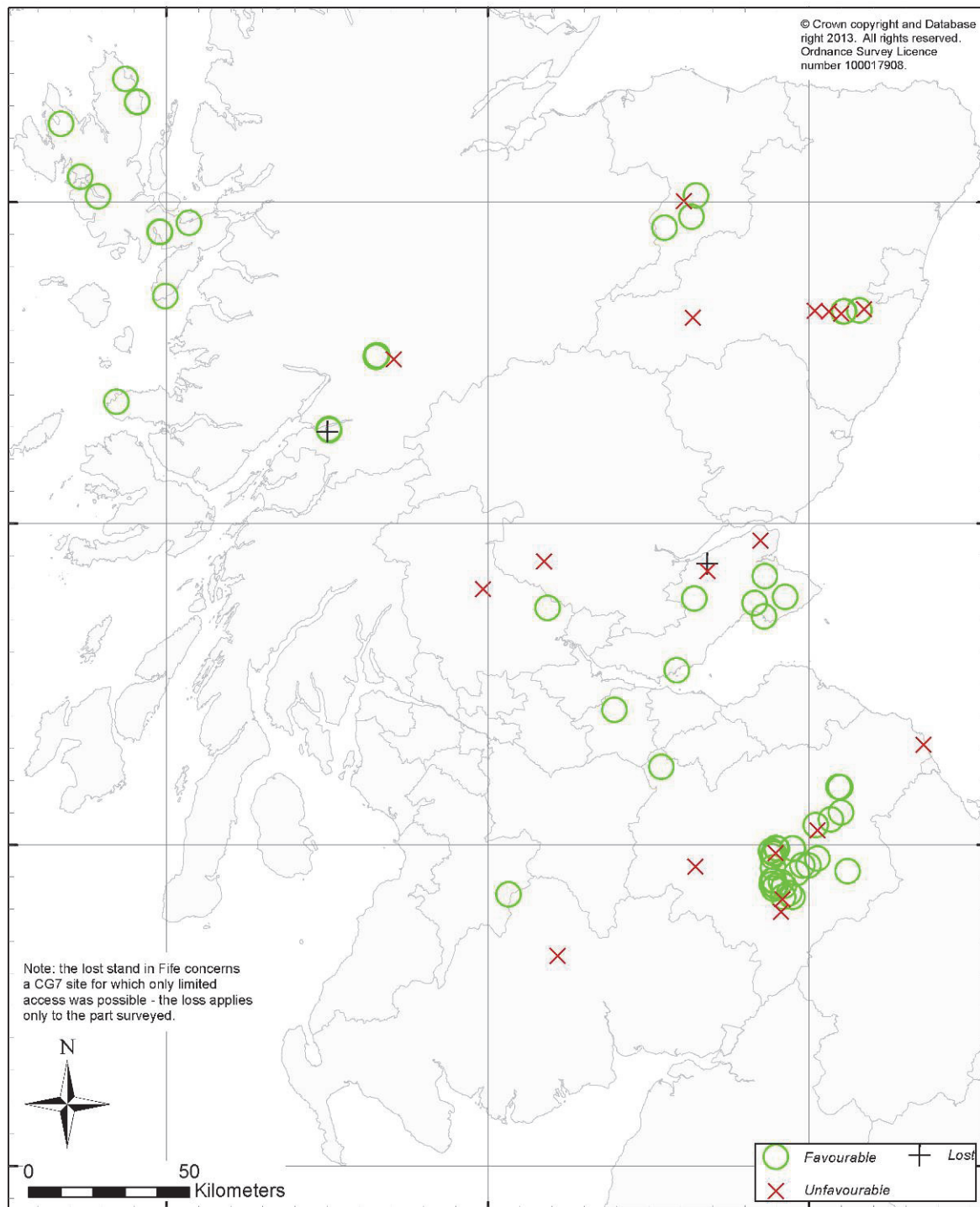


Figure 16. Status of negative indicators attribute for surveyed Annex I grassland sample stands

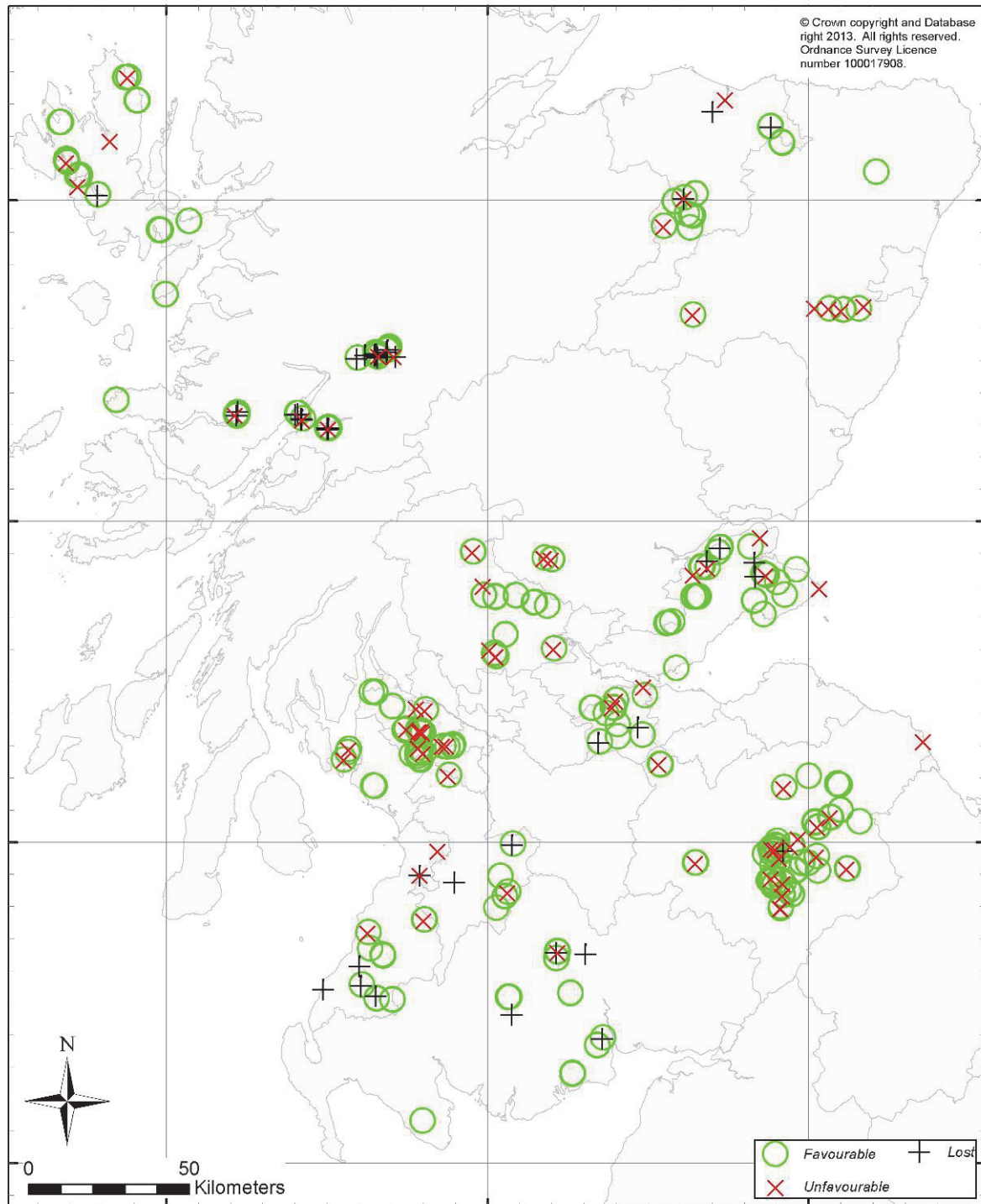


**Figure 17. Status of negative indicators attribute for surveyed BAP Priority grassland sample stands**

### 3.3.4 Grass:forb ratio attribute

Note that the assessment methodology does not apply this attribute to acid grasslands and mires, so the tables in this section do not include BAP Priority Lowland Dry Acid Grassland or Purple Moor-grass & Rush Pasture, nor the Annex I habitat H6410. The data for this attribute is summarised in Table 27, Table 28 and Table 29, and mapped in Figure 18 and Figure 19 below, for Annex I habitats and BAP Priority habitats; data for separate constituent NVC communities are given in Appendix 2.

87% of existing surveyed constituent NVC communities to which this attribute applies were found to have a favourable grass:forb ratio. This includes 100% of stands of Annex I H6210 (CG1, CG2, CG7 and a small part of CG10), 97% of Annex I H6230 (part of CG10) and 81% of Annex I H6520 (MG3).

For the applicable BAP Priority habitats, the vast majority of existing surveyed stands of Lowland Calcareous Grassland are favourable (99%); the only reason that Lowland Calcareous Grassland does not score 100% for this attribute is the favourability of 'only' 98% of CG10. Among the neutral grasslands the majority of stands were found to have a favourable grass:forb ratio too: 81% of existing surveyed Upland Hay Meadow (being the same as Annex I H6520), and 79% of existing surveyed Lowland Hay Meadow (mainly MG5).

A large proportion of constituent MG3 and MG5 stands that are favourable for this attribute still fail overall even at reduced positive indicator thresholds (69% and 38% respectively). This is due to an abundance of negative indicators as well as a lack of positive indicators (rather more the former), and indicates that the forbs contributing to the favourable grass:forb ratio in these cases that fail overall must be common non-indicator forbs (e.g. *Plantago lanceolata*, *Heracleum sphondylium*, *Taraxacum officinalis*), or negative indicator forbs (e.g. *Rumex* spp., *Cirsium* spp., *Urtica dioica*).

Table 27. Grass:forb ratio attribute (lost, unfavourable [U] or favourable [F]) of Annex I habitats, with numbers of stands, according to local authorities (not relevant to H6410)

| Local Authority      | 6210 |      | 6230 |   |    | 6520 |      | Total |
|----------------------|------|------|------|---|----|------|------|-------|
|                      | F    | lost | F    | U | F  | U    | lost |       |
| Aberdeenshire        |      |      | 1    | 1 |    | 5    | 2    | 9     |
| Borders              | 16   |      | 21   |   |    |      |      | 37    |
| Dumfries & Galloway  |      |      |      |   |    | 1    |      | 1     |
| East Ayrshire        |      |      | 1    |   |    |      |      | 1     |
| Fife                 | 9    | 1    |      |   |    |      |      | 10    |
| Highland             | 2    |      | 7    |   |    | 4    | 1    | 14    |
| Moray                |      |      | 3    |   |    | 1    |      | 4     |
| Stirling             |      |      |      |   |    | 2    | 1    | 3     |
| West Lothian         | 1    |      |      |   |    |      |      | 1     |
| Total                | 28   | 1    | 33   | 1 | 13 | 3    | 1    | 80    |
| % of original stands | 97   | 3    | 97   | 3 | 76 | 18   | 6    |       |
| % of existing stands | 100  | n/a  | 97   | 3 | 81 | 19   | n/a  |       |

*Table 28. Grass:forb ratio attribute (lost, unfavourable [U] or favourable [F]) of BAP Priority habitats, with numbers of stands, according to local authorities (not relevant to LDAG and PMRP)*

| Local Authority      | LCG |   |     | UHM |    |     | LM |    |     | Total |
|----------------------|-----|---|-----|-----|----|-----|----|----|-----|-------|
|                      | F   | U | L   | F   | U  | L   | F  | U  | L   |       |
| Aberdeenshire        | 1   | 1 |     | 5   | 2  |     |    | 4  |     | 13    |
| Borders              | 37  |   |     |     |    |     | 10 | 1  | 1   | 49    |
| Dumfries & G.        |     |   |     | 1   |    |     | 3  |    | 2   | 6     |
| East Ayrshire        | 1   |   |     |     |    |     | 3  | 2  |     | 6     |
| Fife                 | 10  |   | 2   |     |    |     | 4  |    | 3   | 19    |
| Highland             | 9   |   |     | 4   |    | 1   | 23 | 6  | 14  | 57    |
| Moray                | 3   |   |     | 1   |    |     | 3  | 1  | 1   | 9     |
| North Ayrshire       | 1   |   |     |     |    |     |    |    |     | 1     |
| Renfrewshire         |     |   |     |     |    |     | 4  | 1  |     | 5     |
| South Ayrshire       | 2   |   | 1   |     |    |     | 4  | 2  | 4   | 13    |
| Stirling             | 2   |   |     | 2   | 1  |     | 4  | 1  |     | 10    |
| West Lothian         | 1   |   |     |     |    |     | 8  |    |     | 9     |
| Total                | 67  | 1 | 3   | 13  | 3  | 1   | 66 | 18 | 25  | 197   |
| % of original stands | 94  | 1 | 4   | 76  | 18 | 6   | 61 | 17 | 23  |       |
| % of existing stands | 99  | 1 | n/a | 81  | 19 | n/a | 79 | 21 | n/a |       |

*Table 29. Grass:forb ratio attribute (unfavourable [U] or favourable [F]) for all existing assessed stands, with percentages, according to local authorities*

| Local Authority     | Favourable | Unfavourable |
|---------------------|------------|--------------|
| Aberdeenshire       | 46%        | 54%          |
| Borders             | 98%        | 2%           |
| Dumfries & Galloway | 100%       | 0%           |
| East Ayrshire       | 67%        | 33%          |
| Fife                | 100%       | 0%           |
| Highland            | 86%        | 14%          |
| Moray               | 88%        | 13%          |
| North Ayrshire      | 100%       | 0%           |
| Renfrewshire        | 80%        | 20%          |
| South Ayrshire      | 75%        | 25%          |
| Stirling            | 80%        | 20%          |
| West Lothian        | 100%       | 0%           |
| Grand Total         | 87%        | 13%          |

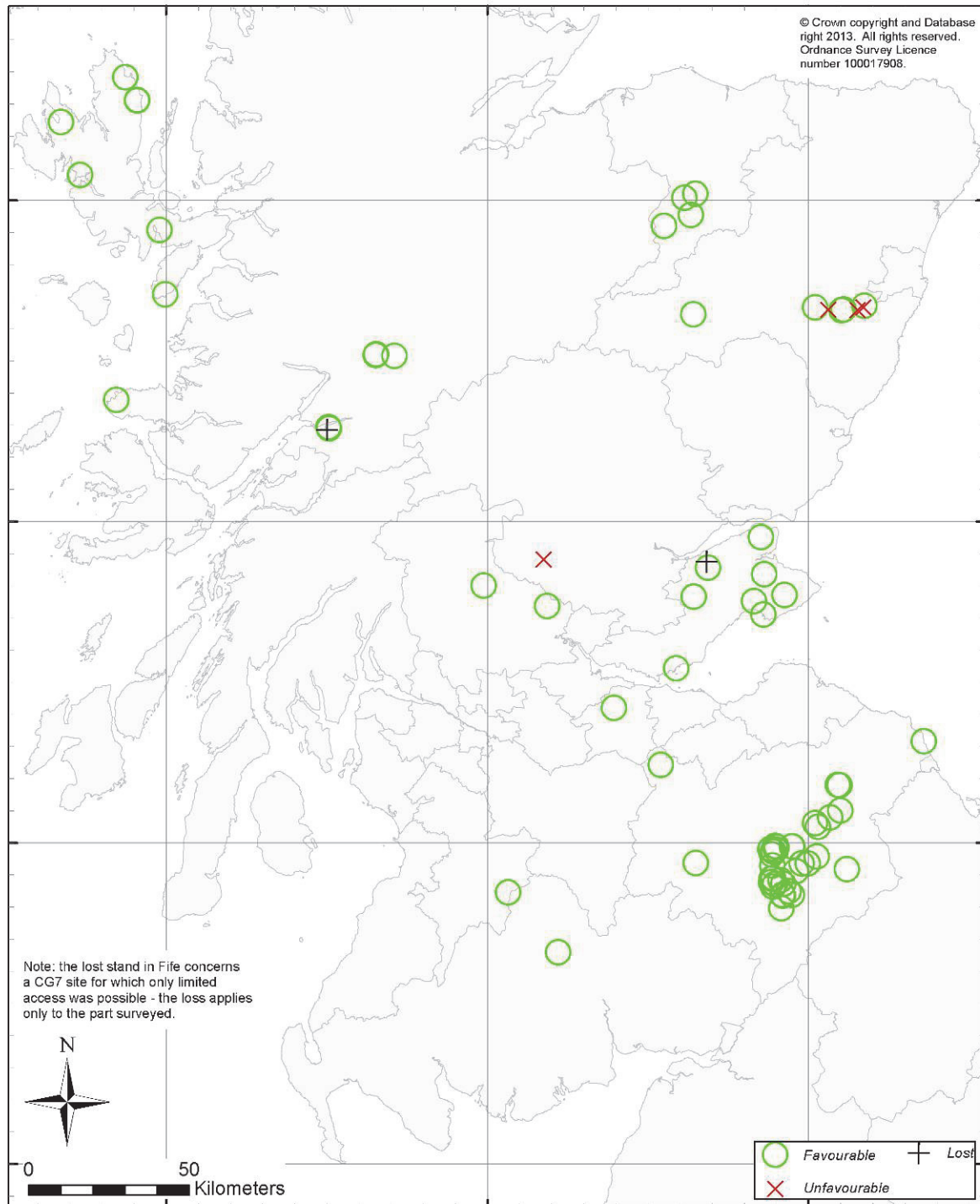


Figure 18. Status of grass:forb ratio attribute(where applicable) for sampled Annex I habitats

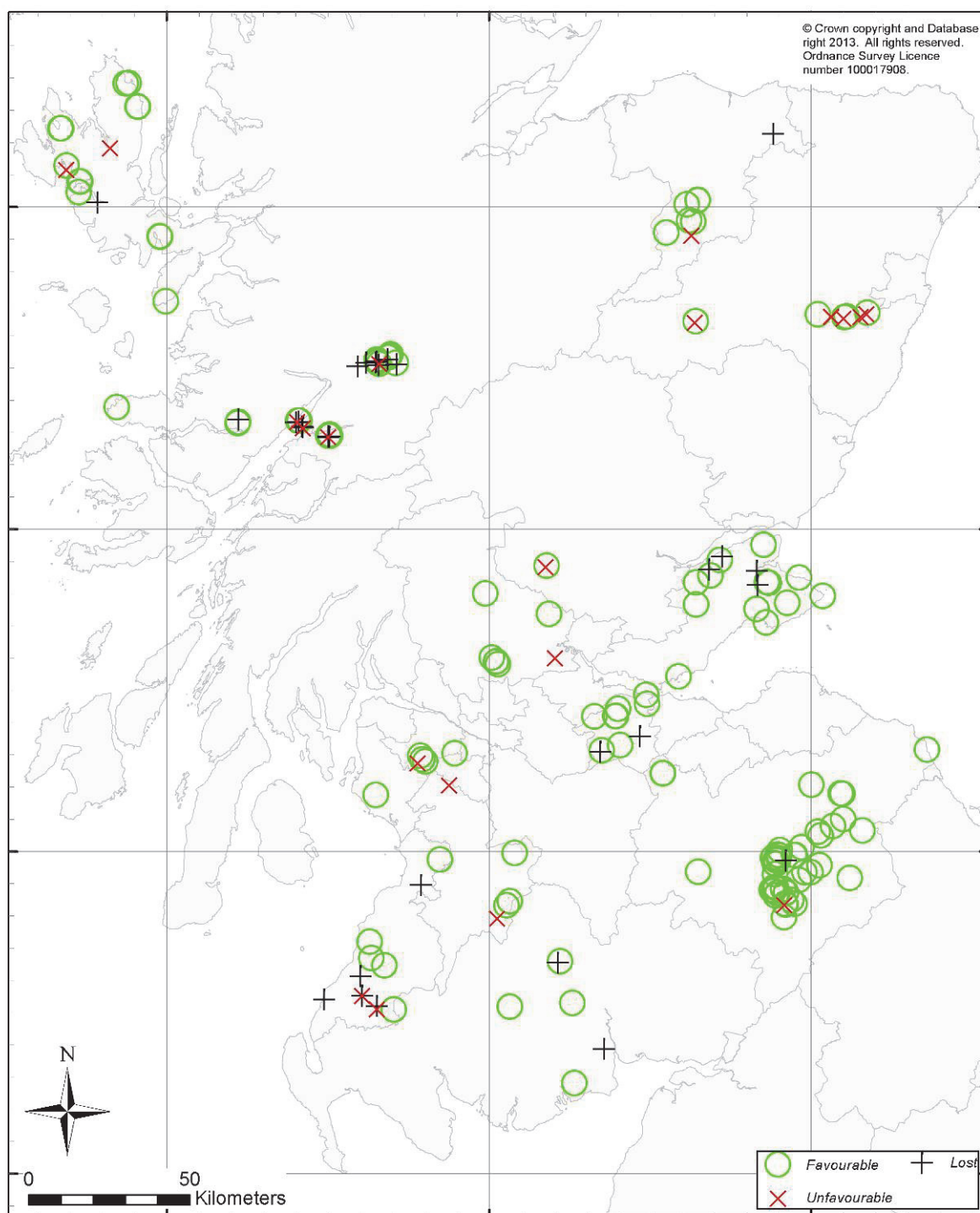


Figure 19. Status of grass:forb ratio attribute(where applicable) for BAP Priority grassland sample stands

### 3.3.5 Vegetation height attribute

The tables and figures in this section show vegetation height information for surveyed Annex I and BAP Priority habitats. Data for separate constituent NVC communities are given in Appendix 2.

Mean vegetation height was found to be favourable in many Annex I habitats, BAP Priority habitats and constituent NVC communities, 86% of existing surveyed stands being favourable overall. Indeed, 100% of Annex I H6210 (CG1, 2, 7 and a small part of CG10), H6230 (part of CG10) and H6410 (M26) were favourable. However, only 6% of existing surveyed stands of Annex I H6520 / Upland Hay Meadow (MG3) was favourable in this respect and this is because most MG3 stands were rather tall and coarse. For the other existing surveyed stands of BAP Priority habitats, pass rates were correspondingly highest for Lowland Calcareous Grassland (100%), followed by Purple Moor-grass & Rush Pasture (97%), Lowland Acid Grassland (90%), and, rather lower, Lowland Meadow (64%).

Individual pass rates for constituent NVC communities were all correspondingly very high with the exception of MG3 and MG5 (corresponding to Upland and Lowland Meadows in the previous paragraph) at 6% and 64% respectively.

From a geographical perspective the percentage of constituent NVC communities in favourable condition for this attribute was consistently and correspondingly high with the exception of Aberdeenshire at 55% favourable. This is the result of a high proportion of MG3 stands, and some MG5 stands, in this region having too much coarse grass. The next lowest scoring regions were Stirling and West Lothian, owing to the unfavourable condition of this attribute at several MG5 and U4 stands, and a few MG3 and M23 stands, again due to coarse grasses and under-management.

*Table 30. Vegetation height attribute (lost, unfavourable [U] or favourable [F]) of Annex I habitats, with numbers of stands, according to local authorities.*

| Local Authority      | 6210 |      | 6230 | 6410 |   | 6520 |      | Total |
|----------------------|------|------|------|------|---|------|------|-------|
|                      | F    | lost | F    | F    | F | U    | lost |       |
| Aberdeenshire        |      |      | 2    |      | 1 | 6    |      | 9     |
| Borders              | 16   |      | 21   |      |   |      |      | 37    |
| Dumfries & Galloway  |      |      |      |      |   | 1    |      | 1     |
| East Ayrshire        |      |      | 1    |      |   |      |      | 1     |
| Fife                 | 9    | 1    |      |      |   |      |      | 10    |
| Highland             | 2    |      | 7    | 6    |   | 4    | 1    | 20    |
| Moray                |      |      | 3    |      |   | 1    |      | 4     |
| Stirling             |      |      |      |      |   | 3    |      | 3     |
| West Lothian         | 1    |      |      |      |   |      |      | 1     |
| Total                | 28   | 1    | 34   | 6    | 1 | 15   | 1    | 86    |
| % of original stands | 97   | 3    | 100  | 100  | 6 | 88   | 6    |       |
| % of existing stands | 100  | n/a  | 100  | 100  | 6 | 94   | n/a  |       |

Table 31. Vegetation height attribute (lost [L], unfavourable [U] or favourable [F]) of BAP Priority habitats, with numbers of stands, according to local authorities.

| Local Authority      | LCG |     | UHM |    |     | LM |    |     | LDAG |    |     | PMRP |   |     | Total |
|----------------------|-----|-----|-----|----|-----|----|----|-----|------|----|-----|------|---|-----|-------|
|                      | F   | L   | F   | U  | L   | F  | U  | L   | F    | U  | L   | F    | U | L   |       |
| Aberdeenshire        | 2   |     | 1   | 6  |     | 1  | 3  |     | 4    |    |     | 3    |   |     | 20    |
| Borders              | 37  |     |     |    |     | 8  | 3  | 1   | 49   | 1  |     | 20   | 3 |     | 122   |
| Dumfries & G.        |     |     |     | 1  |     | 3  |    | 2   | 8    |    | 1   | 10   |   | 3   | 28    |
| East Ayrshire        | 1   |     |     |    |     | 2  | 3  |     | 5    |    |     | 5    |   | 2   | 18    |
| Fife                 | 10  | 2   |     |    |     | 1  | 3  | 3   | 17   | 3  | 2   | 8    |   |     | 49    |
| Highland             | 9   |     |     | 4  | 1   | 23 | 6  | 14  | 9    | 4  | 7   | 36   |   | 6   | 119   |
| Inverclyde           |     |     |     |    |     |    |    |     | 3    |    |     | 6    |   |     | 9     |
| Moray                | 3   |     |     | 1  |     | 4  |    | 1   | 4    | 1  | 2   | 4    |   |     | 20    |
| North Ayrshire       | 1   |     |     |    |     |    |    |     | 4    |    |     | 10   |   |     | 15    |
| Renfrewshire         |     |     |     |    |     | 3  | 2  |     | 10   | 1  |     | 15   |   |     | 31    |
| South Ayrshire       | 2   | 1   |     |    |     | 4  | 2  | 4   | 5    |    |     | 11   | 1 |     | 30    |
| Stirling             | 2   |     |     | 3  |     | 1  | 4  |     | 8    | 2  |     | 19   | 1 |     | 40    |
| West Lothian         | 1   |     |     |    |     | 4  | 4  |     | 6    | 2  | 3   | 5    |   |     | 25    |
| Total                | 68  | 3   | 1   | 15 | 1   | 54 | 30 | 25  | 132  | 14 | 15  | 152  | 5 | 11  | 526   |
| % of original stands | 96  | 4   | 6   | 88 | 6   | 50 | 28 | 23  | 82   | 9  | 9   | 90   | 3 | 7   |       |
| % of existing stands | 100 | n/a | 6   | 94 | n/a | 64 | 36 | n/a | 90   | 10 | n/a | 97   | 3 | n/a |       |

Table 32. Vegetation height attribute (unfavourable [U] of favourable [F] for all existing assessed stands, with percentages, according to local authorities.

| Local Authority     | Favourable | Unfavourable |
|---------------------|------------|--------------|
| Aberdeenshire       | 55%        | 45%          |
| Borders             | 94%        | 6%           |
| Dumfries & Galloway | 95%        | 5%           |
| East Ayrshire       | 81%        | 19%          |
| Fife                | 86%        | 14%          |
| Highland            | 85%        | 15%          |
| Inverclyde          | 100%       | 0%           |
| Moray               | 88%        | 12%          |
| North Ayrshire      | 100%       | 0%           |
| Renfrewshire        | 90%        | 10%          |
| South Ayrshire      | 88%        | 12%          |
| Stirling            | 75%        | 25%          |
| West Lothian        | 73%        | 27%          |
| Total               | 86%        | 14%          |

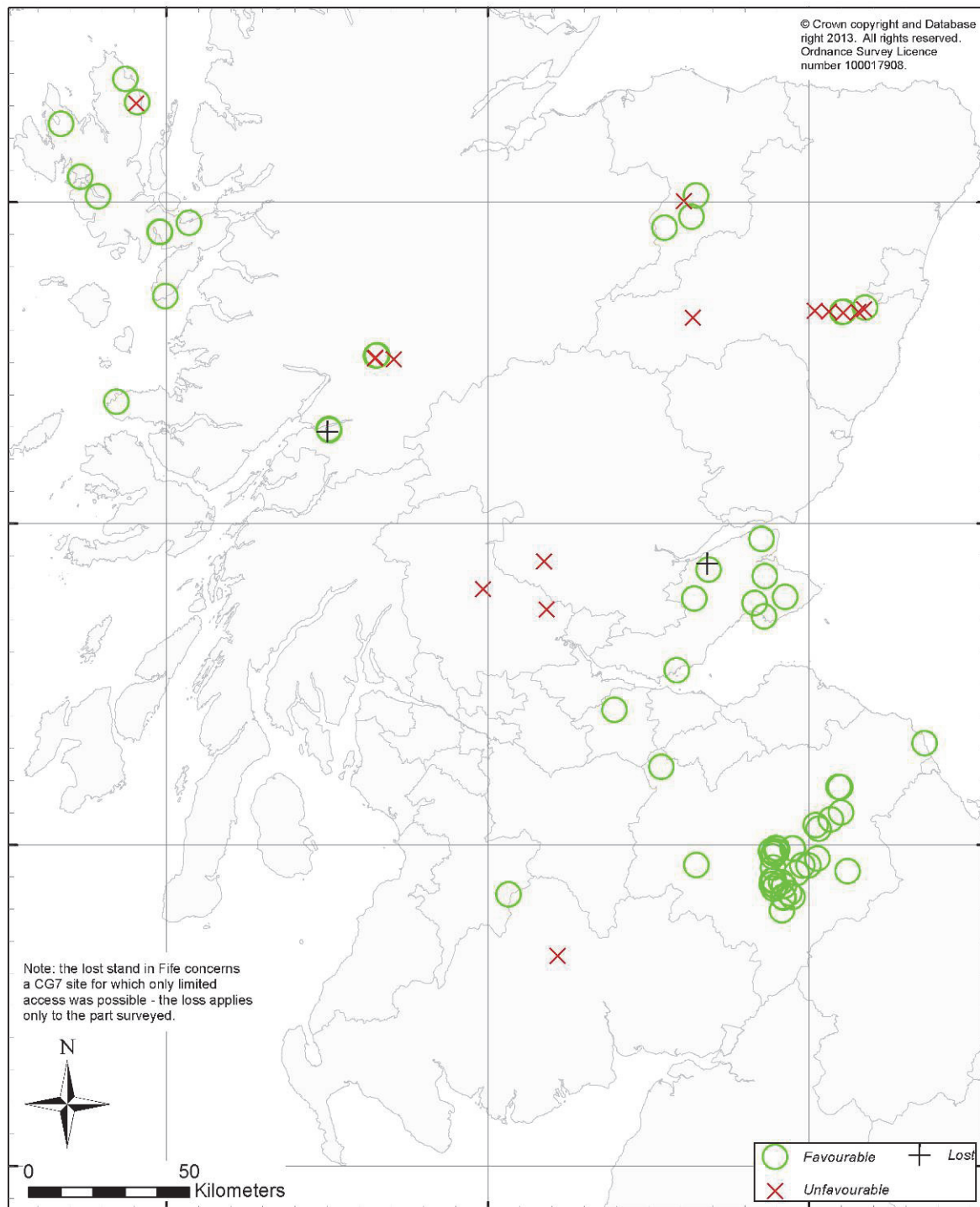


Figure 20. Status of vegetation height attribute for surveyed Annex I grassland sample stands.

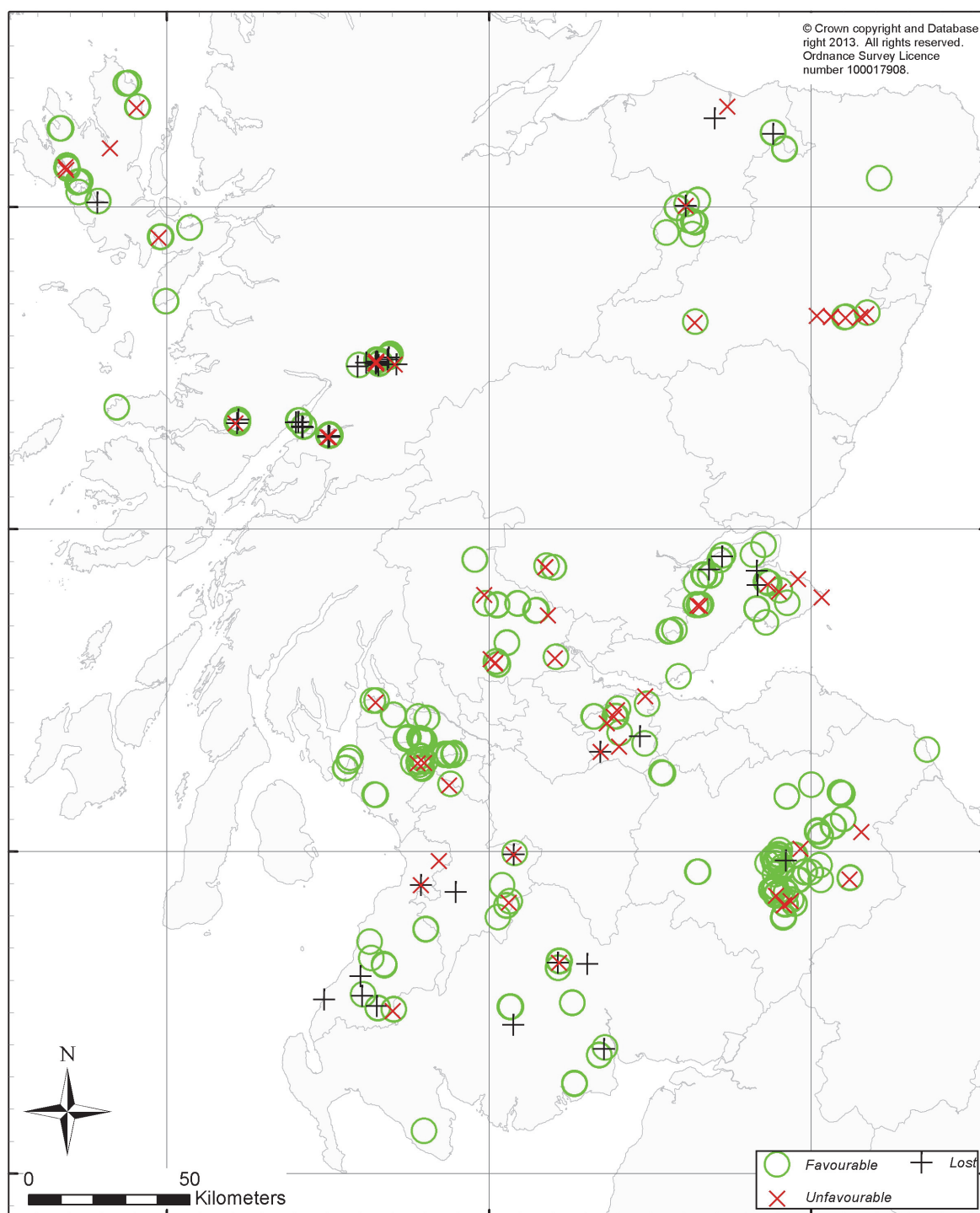


Figure 21. Status of vegetation height attribute for surveyed BAP Priority grassland sample stands.

### 3.3.6 Litter Layer Attribute

The tables and figures in this section show vegetation height information for surveyed Annex I and BAP Priority habitats. Data for separate constituent NVC communities are given in Appendix 2.

Litter mats were found to be favourably sparse in 90% of existing surveyed constituent NVC communities. Indeed, 100% of existing surveyed Annex I H6210 (CG1,2,7) and H6410 (M26) were favourable. However, only 75% of existing surveyed Annex I H6520 / Upland Hay Meadow (MG3) was favourable in this respect; this is to be expected since this habitat also had the lowest proportion of favourable vegetation height attributes, often being coarse. For the other BAP Priority habitats, pass rates were correspondingly highest for existing surveyed stands of Lowland Calcareous Grassland (99%), followed by Lowland Meadow (96%), Lowland Acid Grassland (91%) and Purple Moor-grass & Rush Pasture (84%).

Individual pass rates for constituent NVC communities were all very high with the exception of MG3 at 75% (corresponding to Annex I H6520 / Upland Hay Meadow in the previous paragraph), and M25 at 76% favourable, followed by M23 at 86% and U4 at 89%.

From a geographical perspective the percentage of constituent NVC communities in favourable condition for this attribute was very high except in South Ayrshire (72%), North Ayrshire (73%), Aberdeenshire (75%), West Lothian (77%) and Stirling (78%). The unfavourable Aberdeenshire stands include CG10, MG5, MG3 and U4 and all result from under-management of River Dee sites. The other lower scoring regions do so mostly because of coarse M23 and M25.

*Table 33. Litter layer attribute (lost, unfavourable [U] or favourable [F]) of Annex I habitats, with numbers of stands, according to local authorities*

| Local Authority      | 6210 |      | 6230 |   | 6410 | 6520 |    |      | Total |
|----------------------|------|------|------|---|------|------|----|------|-------|
|                      | F    | lost | F    | U | F    | F    | U  | lost |       |
| Aberdeenshire        |      |      | 1    | 1 |      | 6    | 1  |      | 9     |
| Borders              | 16   |      | 21   |   |      |      |    |      | 37    |
| Dumfries & Galloway  |      |      |      |   |      |      | 1  |      | 1     |
| East Ayrshire        |      |      | 1    |   |      |      |    |      | 1     |
| Fife                 | 9    | 1    |      |   |      |      |    |      | 10    |
| Highland             | 2    |      | 7    |   | 6    | 4    |    | 1    | 20    |
| Moray                |      |      | 3    |   |      | 1    |    |      | 4     |
| Stirling             |      |      |      |   |      | 1    | 2  |      | 3     |
| West Lothian         | 1    |      |      |   |      |      |    |      | 1     |
| Total                | 28   | 1    | 33   | 1 | 6    | 12   | 4  | 1    | 86    |
| % of original stands | 97   | 3    | 97   | 3 | 100  | 71   | 24 | 6    |       |
| % of existing stands | 100  | n/a  | 97   | 3 | 100  | 75   | 25 | n/a  |       |

Table 34. Litter layer attribute (lost [L], unfavourable [U] or favourable [F]) of BAP Priority habitats, with numbers of stands, according to local authorities

| Local Authority      | LCG |   |     | UHM |    |     | LM |   |     | LDAG |    |     | PMRP |    |     | Total |
|----------------------|-----|---|-----|-----|----|-----|----|---|-----|------|----|-----|------|----|-----|-------|
|                      | F   | U | L   | F   | U  | L   | F  | U | L   | F    | U  | L   | F    | U  | L   |       |
| Aberdeenshire        | 1   | 1 |     | 6   | 1  |     | 2  | 2 |     | 3    | 1  |     | 3    |    |     | 20    |
| Borders              | 37  |   |     |     |    |     | 11 |   | 1   | 50   |    |     | 23   |    |     | 122   |
| Dumfries & G.        |     |   |     |     | 1  |     | 3  |   | 2   | 8    |    | 1   | 9    | 1  | 3   | 28    |
| East Ayrshire        | 1   |   |     |     |    |     | 5  |   |     | 4    | 1  |     | 5    |    | 2   | 18    |
| Fife                 | 10  |   | 2   |     |    |     | 4  |   | 3   | 16   | 4  | 2   | 8    |    |     | 49    |
| Highland             | 9   |   |     | 4   |    | 1   | 29 |   | 14  | 12   | 1  | 7   | 34   | 2  | 6   | 119   |
| Inverclyde           |     |   |     |     |    |     |    |   |     | 3    |    |     | 6    |    |     | 9     |
| Moray                | 3   |   |     | 1   |    |     | 4  |   | 1   | 5    |    | 2   | 4    |    |     | 20    |
| North Ayrshire       | 1   |   |     |     |    |     |    |   |     | 4    |    |     | 6    | 4  |     | 15    |
| Renfrewshire         |     |   |     |     |    |     | 5  |   |     | 10   | 1  |     | 10   | 5  |     | 31    |
| South Ayrshire       | 2   |   | 1   |     |    |     | 5  | 1 | 4   | 5    |    |     | 6    | 6  |     | 30    |
| Stirling             | 2   |   |     | 1   | 2  |     | 5  |   |     | 7    | 3  |     | 16   | 4  |     | 40    |
| West Lothian         | 1   |   |     |     |    |     | 8  |   |     | 6    | 2  | 3   | 2    | 3  |     | 25    |
| Total                | 67  | 1 | 3   | 12  | 4  | 1   | 81 | 3 | 25  | 133  | 13 | 15  | 132  | 25 | 11  | 526   |
| % of original stands | 94  | 1 | 4   | 71  | 24 | 6   | 74 | 3 | 23  | 83   | 8  | 9   | 79   | 15 | 7   |       |
| % of existing stands | 99  | 1 | n/a | 75  | 25 | n/a | 96 | 4 | n/a | 91   | 9  | n/a | 84   | 16 | n/a |       |

Table 35. Litter layer attribute (unfavourable [U] or favourable [F]) for all existing assessed stands, with percentages, according to local authorities.

| Local Authority     | Favourable | Unfavourable |
|---------------------|------------|--------------|
| Aberdeenshire       | 75%        | 25%          |
| Borders             | 100%       | 0%           |
| Dumfries & Galloway | 91%        | 9%           |
| East Ayrshire       | 94%        | 6%           |
| Fife                | 90%        | 10%          |
| Highland            | 97%        | 3%           |
| Inverclyde          | 100%       | 0%           |
| Moray               | 100%       | 0%           |
| North Ayrshire      | 73%        | 27%          |
| Renfrewshire        | 81%        | 19%          |
| South Ayrshire      | 72%        | 28%          |
| Stirling            | 78%        | 23%          |
| West Lothian        | 77%        | 23%          |
| Grand Total         | 90%        | 10%          |

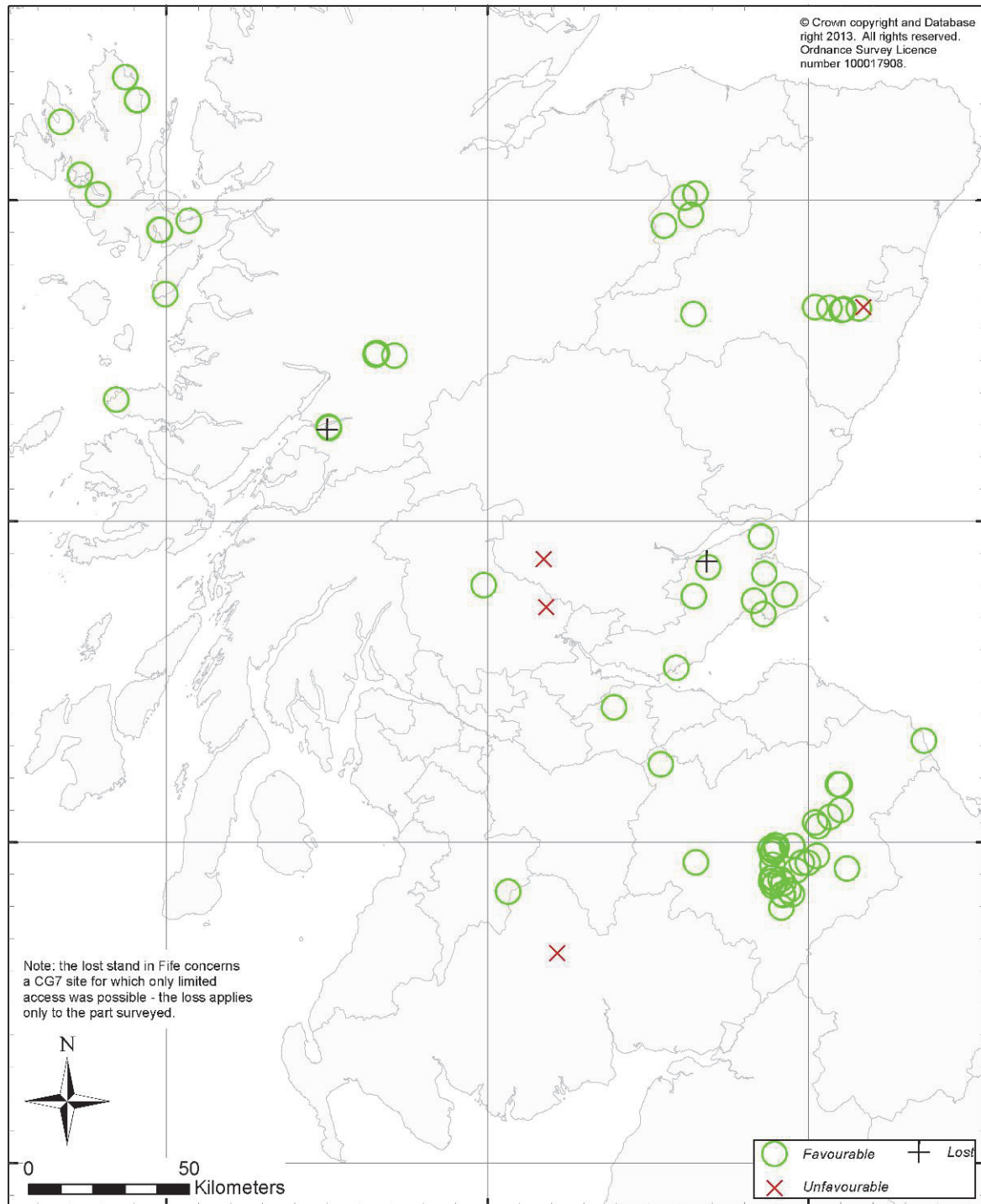


Figure 22. Status of vegetation height attribute for surveyed Annex I grassland sample stands.

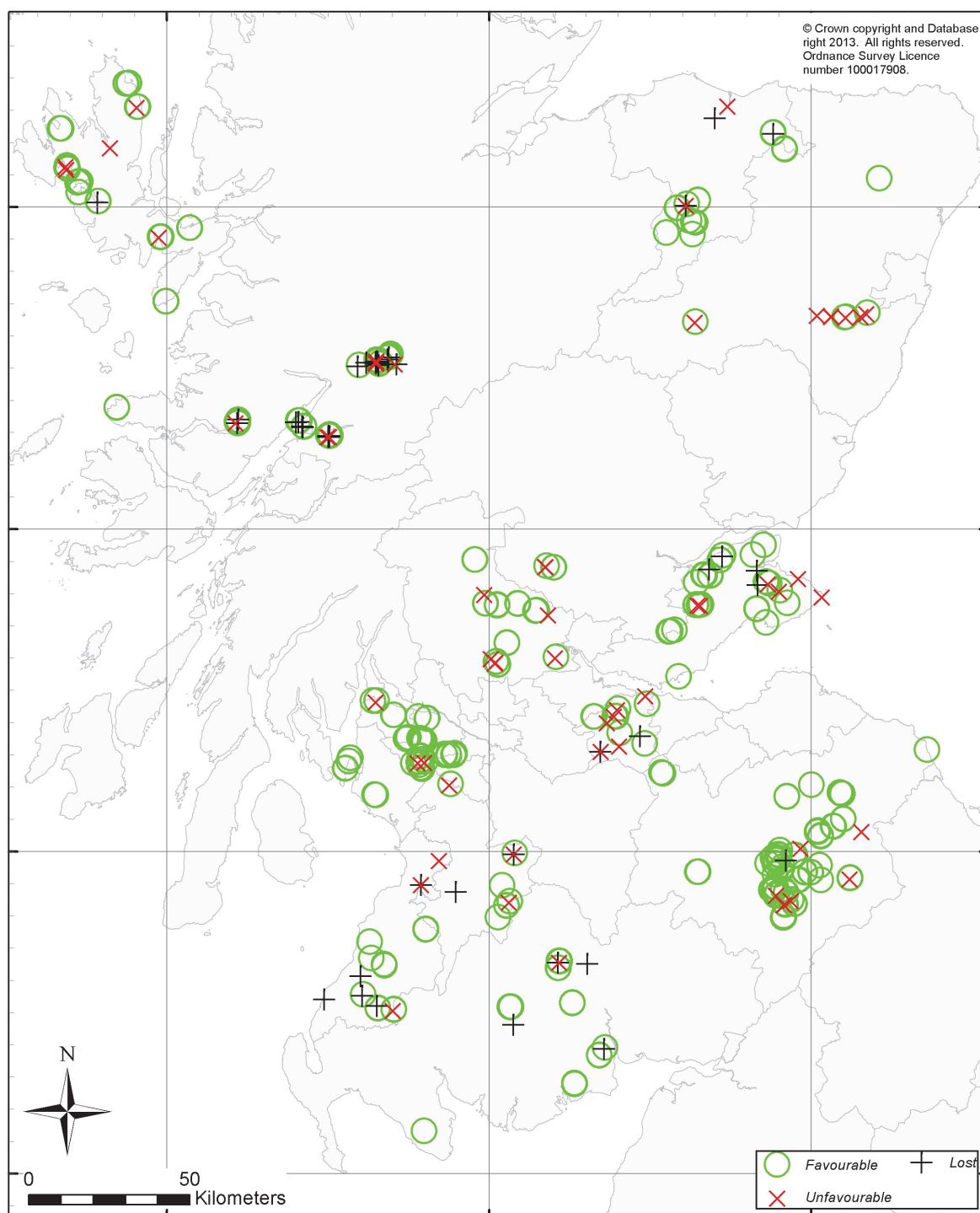


Figure 23. Status of vegetation height attribute for surveyed BAP Priority grassland sample stands.

### 3.3.7 Bare ground attribute

The tables and figures in this section show bare ground information for surveyed Annex I and BAP Priority habitats. Data for separate constituent NVC communities are given in Appendix 2.

Bare ground was generally not extensive, and this attribute was found to be favourable in 92% of constituent NVC communities. 100% of existing surveyed stands of Annex I H6410 (M26) and H6520 / BAP Priority Upland Hay Meadow (MG3) was favourable. Of the surveyed calcareous Annex I grasslands, Annex I H6210 (CG1, 2, 7 and a small part of CG10) scored less well at 86% favourable, but H6230 (part of CG10) was 100% favourable, indicating that amongst the calcareous constituent NVC communities bare ground was a problem (though not a great one) for the rarer types.

For BAP Priority habitats, the pass rate for Lowland Calcareous Grassland (91%) is slightly higher than Annex I H6210, again a reflection of the unfavourable bare ground in the rarer Annex I calcareous grasslands, whilst the more widespread CG10 was 100% favourable for bare ground. This is borne out by the unfavourable condition of 15% of CG7 and the single CG1 stand. Purple Moor-grass & Rush Pasture scores very highly at 98%, and would be 100% favourable but for three stands of M23 which appear to suffer from poaching. Lowland Meadow also scores very highly (96%), with three small MG5 stands again appearing to suffer from poaching. Lowland Acid Grassland scores least well at 82%, and this is largely due to the very poor score here for U1 (30%; but see Discussion regarding this attribute in U1). Other constituent NVC communities scored no less than 85% favourable for this attribute, with the exception of the single CG1 stand which fails it.

*Table 36. Bare ground attribute (lost, unfavourable [U] or favourable [F]) of Annex I habitats, with numbers of stands, according to local authorities*

| Local Authority      | 6210 |    |      | 6230 |  | 6410 |  | 6520 |      | Total |
|----------------------|------|----|------|------|--|------|--|------|------|-------|
|                      | F    | U  | lost | F    |  | F    |  | F    | lost |       |
| Aberdeenshire        |      |    |      | 2    |  |      |  | 7    |      | 9     |
| Borders              | 14   | 2  |      | 21   |  |      |  |      |      | 37    |
| Dumfries & Galloway  |      |    |      |      |  |      |  | 1    |      | 1     |
| East Ayrshire        |      |    |      | 1    |  |      |  |      |      | 1     |
| Fife                 | 7    | 2  | 1    |      |  |      |  |      |      | 10    |
| Highland             | 2    |    |      | 7    |  | 6    |  | 4    | 1    | 20    |
| Moray                |      |    |      | 3    |  |      |  | 1    |      | 4     |
| Stirling             |      |    |      |      |  |      |  | 3    |      | 3     |
| West Lothian         | 1    |    |      |      |  |      |  |      |      | 1     |
| Total                | 24   | 4  | 1    | 34   |  | 6    |  | 16   | 1    | 86    |
| % of original stands | 83   | 14 | 3    | 100  |  | 100  |  | 94   | 6    |       |
| % of existing stands | 86   | 14 | n/a  | 100  |  | 100  |  | 94   | 6    |       |

*Table 37. Bare ground attribute (lost [L], unfavourable [U] or favourable [F]) of BAP Priority habitats, with numbers of stands, according to local authorities*

| Local Authority      | LCG |   |     | UHM |     | LM |   |     | LDAG |    |     | PMRP |   |     | Total |
|----------------------|-----|---|-----|-----|-----|----|---|-----|------|----|-----|------|---|-----|-------|
|                      | F   | U | L   | F   | L   | F  | U | L   | F    | U  | L   | F    | U | L   |       |
| Aberdeenshire        | 2   |   |     | 7   |     | 4  |   |     | 4    |    |     | 3    |   |     | 20    |
| Borders              | 35  | 2 |     |     |     | 11 |   | 1   | 38   | 12 |     | 23   |   |     | 122   |
| Dumfries & G.        |     |   |     | 1   |     | 3  |   | 2   | 8    |    | 1   | 10   |   | 3   | 28    |
| East Ayrshire        | 1   |   |     |     |     | 5  |   |     | 4    | 1  |     | 5    |   | 2   | 18    |
| Fife                 | 8   | 2 | 2   |     |     | 3  | 1 | 3   | 14   | 6  | 2   | 8    |   |     | 49    |
| Highland             | 9   |   |     | 4   | 1   | 29 |   | 14  | 13   |    | 7   | 36   |   | 6   | 119   |
| Inverclyde           |     |   |     |     |     |    |   |     | 3    |    |     | 6    |   |     | 9     |
| Moray                | 3   |   |     | 1   |     | 4  |   | 1   | 5    |    | 2   | 4    |   |     | 20    |
| North Ayrshire       |     | 1 |     |     |     |    |   |     | 3    | 1  |     | 9    | 1 |     | 15    |
| Renfrewshire         |     |   |     |     |     | 4  | 1 |     | 9    | 2  |     | 14   | 1 |     | 31    |
| South Ayrshire       | 1   | 1 | 1   |     |     | 5  | 1 | 4   | 4    | 1  |     | 11   | 1 |     | 30    |
| Stirling             | 2   |   |     | 3   |     | 5  |   |     | 8    | 2  |     | 20   |   |     | 40    |
| West Lothian         | 1   |   |     |     |     | 8  |   |     | 7    | 1  | 3   | 5    |   |     | 25    |
| Total                | 62  | 6 | 3   | 16  | 1   | 81 | 3 | 25  | 120  | 26 | 15  | 154  | 3 | 11  | 526   |
| % of original stands | 87  | 8 | 4   | 94  | 6   | 74 | 3 | 23  | 75   | 16 | 9   | 92   | 2 | 7   |       |
| % of existing stands | 91  | 9 | n/a | 100 | n/a | 96 | 4 | n/a | 82   | 18 | n/a | 98   | 2 | n/a |       |

*Table 38. Bare ground attribute (lost, unfavourable [U] or favourable [F]) for all existing assessed stands, with percentages, according to local authorities*

| Local Authority     | Favourable | Unfavourable |
|---------------------|------------|--------------|
| Aberdeenshire       | 100%       | 0%           |
| Borders             | 88%        | 12%          |
| Dumfries & Galloway | 100%       | 0%           |
| East Ayrshire       | 94%        | 6%           |
| Fife                | 79%        | 21%          |
| Highland            | 100%       | 0%           |
| Inverclyde          | 100%       | 0%           |
| Moray               | 100%       | 0%           |
| North Ayrshire      | 80%        | 20%          |
| Renfrewshire        | 87%        | 13%          |
| South Ayrshire      | 84%        | 16%          |
| Stirling            | 95%        | 5%           |
| West Lothian        | 95%        | 5%           |
| Grand Total         | 92%        | 8%           |

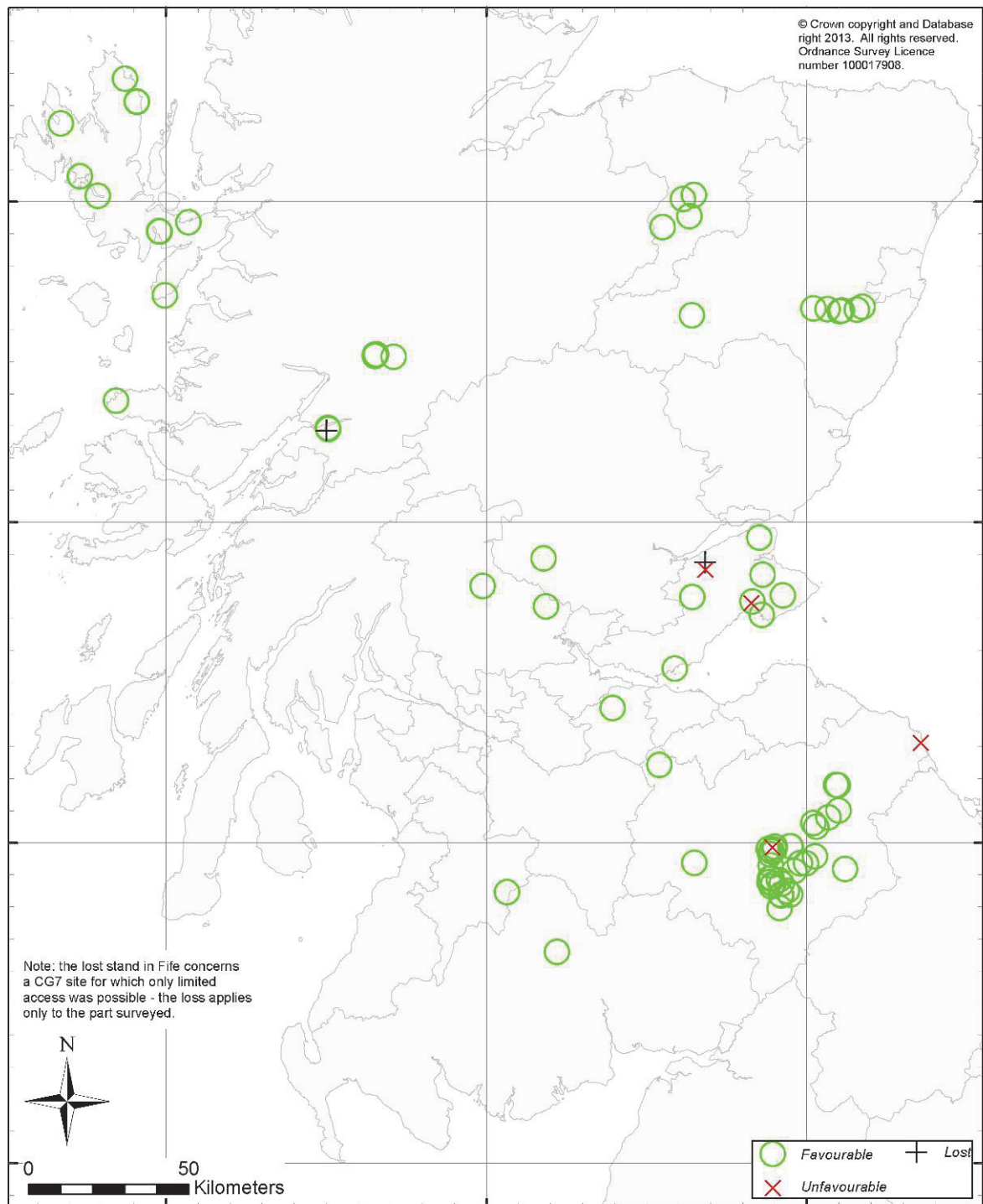


Figure 24. Status of bare ground attribute for surveyed Annex I grassland sample stands.

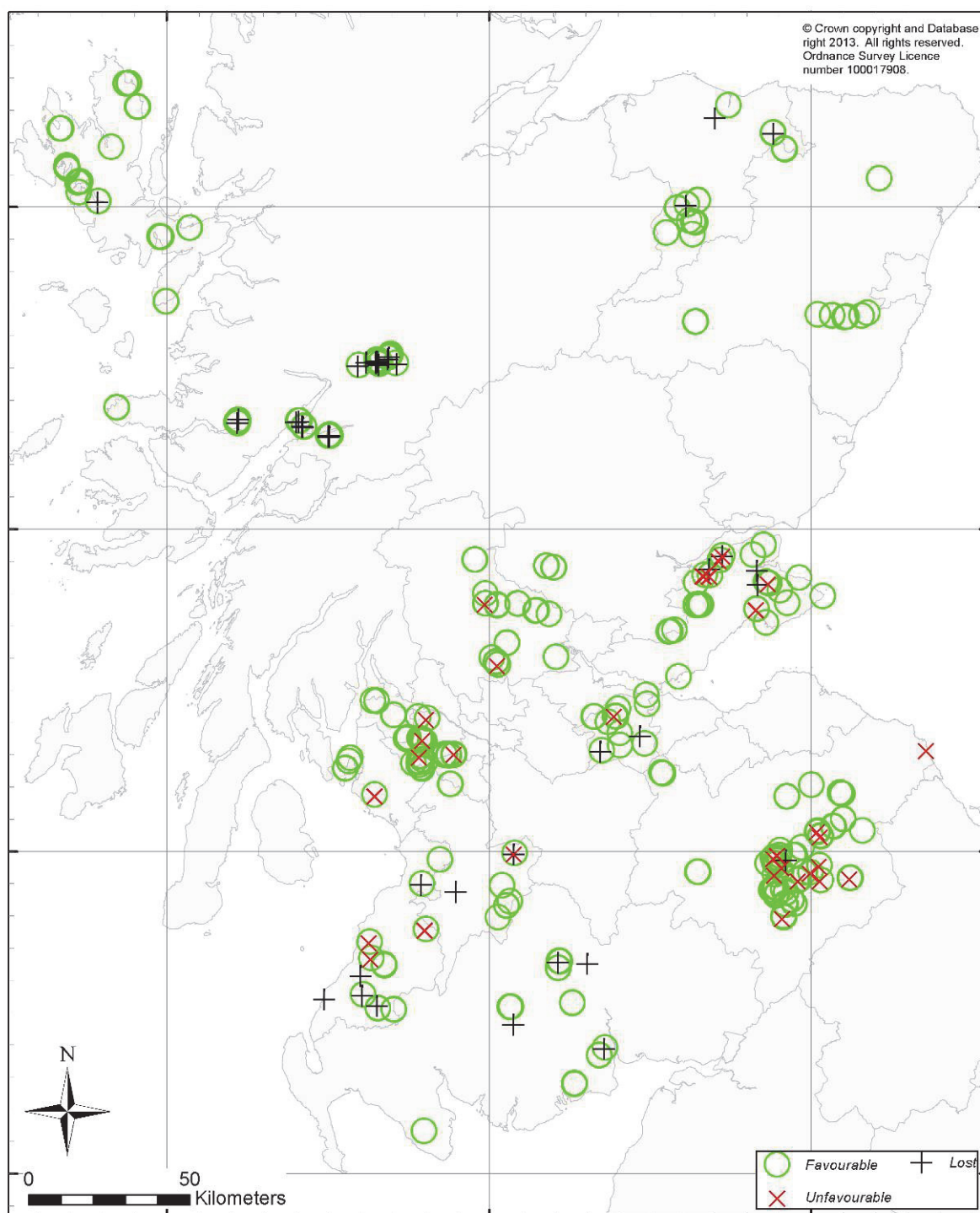


Figure 25. Status of bare ground attribute for surveyed BAP Priority grassland sample stands.

### 3.3.8 Additional comparisons

Table 39 is additional to the requirements of the project brief, but has been included out of interest. A comparison is made here of the mean number of positive indicator species in each constituent NVC community in each local authority area. At the bottom of the table is a row for average number of positive indicators in each community as a whole, and along the right hand edge is a column for average number of positive indicators in each local authority

area as a whole. Two sets of figures are given: the upper plain figures are the mean numbers of positive indicators; the lower italic figures are the numbers of stand assessments on which the upper figure is based.

Figures highlighted in green are those where the average number of positive indicators is 20% or more higher than the community average, where this is based on five or more stands (since averages based on only a few stands are unreliable). Similarly, figures in red are those where the average number of positive indicators is 20% or more lower than the community average, again only where this is based on five or more stands.

This comparison shows that:

- the sampled CG7 was more diverse in the Borders than in Fife, the only areas in which this community was found (as expected, since this is a southerly community);
- the sampled MG3 was particularly diverse in Aberdeenshire (a result of some relatively diverse River Dee stands);
- the sampled MG5 was particularly diverse in Renfrewshire and particularly poor in South Ayrshire (the former a result of a high quality MG5 site subsequently assigned SSSI status; the latter a result of five poor MG5 stands suffering a combination of overgrazing and under-management);
- the sampled U4 was particularly diverse in the Borders (as expected), and particularly poor in Dumfries & Galloway, Renfrewshire, South Ayrshire, Stirling and West Lothian (the former a result of the frequency of some of the more diverse U4 sub-communities in the Borders; and the poor U4 regions suffering from a combination of overgrazing and under-management);
- the sampled M23 was particularly diverse in Dumfries & Galloway and North Ayrshire, and particularly poor in the Borders (more or less agreeing with expectation, since the wetter south-western areas had species lacking elsewhere such as *Carum verticillatum*, and the Borders is a relatively dry region with often only small patches of M23 of little interest compared to the dry short grasslands);
- the sampled M25 was particularly poor in Renfrewshire, Fife and the Highlands (a result of several stands of species-poor M25, some of which were not noted in the original surveys, often being of limited extent and not the main interest of the sites).

Table 39. Comparison of average number of positive indicator species in each constituent NVC community, according to local authority areas. The upper figures are the mean numbers of positive indicators; the lower italic figures are the numbers of stand assessments on which the upper figure is based. (Green: high numbers of positive indicators; red: low numbers of positive indicators)

| Local Authority     | CG1 | CG2 | CG7 | CG10 | MG3 | MG5 | MG8 | U1  | U4  | M23 | M25 | M26 | Authority average |
|---------------------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-------------------|
| Aberdeenshire       |     |     |     | 3.5  | 5.4 | 5.0 |     |     | 4.5 | 2.5 | 4.0 |     | 4.6               |
|                     |     |     |     | 2    | 7   | 4   |     |     | 4   | 2   | 1   |     | 20                |
| Borders             | 6.0 | 8.0 | 8.6 | 8.3  |     | 4.8 |     | 5.8 | 5.9 | 2.3 | 4.0 |     | 5.9               |
|                     | 1   | 2   | 13  | 21   |     | 11  |     | 17  | 33  | 21  | 2   |     | 121               |
| Dumfries & Galloway |     |     |     |      | 4.0 | 5.3 |     | 2.0 | 3.2 | 5.0 | 5.7 |     | 4.4               |
|                     |     |     |     |      | 1   | 3   |     | 1   | 7   | 7   | 3   |     | 22                |
| East Ayrshire       |     |     |     | 5.0  |     | 4.6 |     |     | 4.2 | 1.8 | 4.0 |     | 3.8               |
|                     |     |     |     | 1    |     | 5   |     |     | 5   | 4   | 1   |     | 16                |
| Fife                |     | 8.0 | 4.6 | 6.0  |     | 4.0 |     | 4.5 | 3.9 | 3.2 | 3.0 |     | 4.1               |
|                     |     | 1   | 7   | 2    |     | 4   |     | 6   | 14  | 6   | 2   |     | 42                |
| Highland            |     |     |     | 7.3  | 4.0 | 4.4 |     |     | 3.8 | 2.4 | 3.4 | 6.3 | 4.2               |
|                     |     |     |     | 9    | 4   | 29  |     |     | 13  | 21  | 9   | 6   | 91                |
| Inverclyde          |     |     |     |      |     |     |     |     | 3.0 | 3.3 | 4.0 |     | 3.3               |
|                     |     |     |     |      |     |     |     |     | 3   | 4   | 2   |     | 9                 |
| Moray               |     |     |     | 5.7  | 3.0 | 5.3 | 2.0 |     | 5.0 | 2.8 |     |     | 4.4               |
|                     |     |     |     | 3    | 1   | 3   | 1   |     | 5   | 4   |     |     | 17                |
| North Ayrshire      |     |     |     | 9.0  |     |     |     |     | 4.0 | 4.3 | 7.0 |     | 5.1               |
|                     |     |     |     | 1    |     |     |     |     | 4   | 7   | 3   |     | 15                |
| Renfrewshire        |     |     |     |      | 6.2 |     |     |     | 2.6 | 3.4 | 0.0 |     | 3.5               |
|                     |     |     |     |      | 5   |     |     |     | 11  | 14  | 1   |     | 31                |
| South Ayrshire      |     |     |     | 9.5  |     | 3.8 |     |     | 2.8 | 2.5 | 3.5 |     | 3.6               |
|                     |     |     |     | 2    |     | 6   |     |     | 5   | 8   | 4   |     | 25                |
| Stirling            |     |     |     | 6.5  | 4.3 | 4.2 |     | 4.0 | 3.0 | 3.6 | 5.9 |     | 4.3               |
|                     |     |     |     | 2    | 3   | 5   |     | 2   | 8   | 11  | 9   |     | 40                |
| West Lothian        |     | 7.0 |     |      |     | 5.0 |     | 5.0 | 3.3 | 2.4 |     |     | 4.0               |
|                     |     | 1   |     |      |     | 8   |     | 1   | 7   | 5   |     |     | 22                |
| Community average   | 6.0 | 7.8 | 7.2 | 7.5  | 4.6 | 4.7 | 2.0 | 5.2 | 4.2 | 3.0 | 4.4 | 6.3 | 4.6               |

## 4. DISCUSSION

This section begins with summaries of the distribution and nature of the Annex I and BAP Priority grassland habitats surveyed for this project. Summary descriptions for the individual constituent NVC communities are given in Appendix 3.

### 4.1 Summaries of the distribution and nature of surveyed Annex I lowland grasslands

#### 4.1.1 Annex I habitat H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*)

This Annex I habitat type, as found in this survey, is composed almost entirely of three NVC communities (CG1, CG2 and CG7) each of which is distributed predominantly in southern, lowland Britain, and therefore in Scotland confined to the south-east. In addition, this Annex I habitat includes those CG10 stands on limestone bedrock, which appear to be very rare, with only three stands sampled in this survey.

The communities which largely comprise this habitat (CG1, CG2 and CG7) have short swards in which *Festuca ovina* is accompanied by varied combinations (depending on the NVC community) of *Koeleria macrantha*, *Trisetum flavescens*, *Helictotrichon pratense*, *Briza media*, *Carex caryophyllaea* and *C. flacca*. Low mats and patches of *Thymus polytrichus* are abundant, and those of *Helianthemum nummularium* are common too. There is also a good representation of low-grown herbs including *Lotus corniculatus*, *Pilosella officinarum*, *Plantago lanceolata*, *Prunella vulgaris*, *Galium verum*, *Campanula rotundifolia*, *Arenaria serpyllifolia*, *Sedum acre*, *Trifolium striatum*, *Anthyllis vulneraria*, *Hypochaeris radicata*, *Leontodon autumnalis* and *Taraxacum* agg. Mosses are quite common and include *Hypnum lacunosum*, *Polytrichum juniperinum*, *Brachythecium albicans*, *Bryum capillare* and *Grimmia pulvinata*. The vegetation is recognized as belonging to this Annex I habitat by the combination of abundant thyme and rockrose (identifying it as a calcareous grassland), and the relative scarcity of *Agrostis capillaris*, *Anthoxanthum odoratum* and *Potentilla erecta*, whose presence in quantity indicates the more upland CG10 community. The three stands of CG10 apparently on limestone bedrock (and therefore qualifying as Annex I H6210) did not appear to differ radically from CG10 elsewhere, with typical species such as *T. polytrichus*, *P. erecta* and *A. odoratum*, and a lack of several of the species described above for CG1/CG2/CG7, but it is notable that in the qualifying Lochaber CG10 there was *Platanthera chlorantha* and *Gymnadenia conopsea*, and in one case *Galium boreale*. The three qualifying CG10 stands were all very small.

CG1, CG2 and CG7 were found only in the drier south-eastern parts of Scotland, in the Borders and Fife (apart from one tiny quantity of CG2 at one West Lothian site on calcareous spoil), on thin, dry soils on slopes generally facing more or less south. At many sites the slopes are steep, with vegetation cover broken by patches of bare soil and rock outcrops. CG7 is much the commonest NVC community here, occurring at 20 sites in this survey (though generally in noticeably small quantity: average stand area was only 0.25 ha); CG2 was found at four sites and CG1 at one site. The south-eastern distribution of CG1, CG2 and CG7 is expected given that they are communities of lowland areas with a relatively warm, dry climate. Stands were typically small which is typical of the wider occurrences of these communities, though there was one large CG2 stand in the Borders (see next paragraph). The very little CG10 apparently qualifying for this Annex I habitat was found in Lochaber (Glen Coe) and at an old disused quarry in Fife.

The CG1, CG2 and CG7 stands which comprise the vast majority of this Annex I habitat found in this survey are of high conservation value in that (a) much of the vegetation is very species-rich, unimproved grassland, and (b) the grasslands include populations of southern species that are rare this far north in Britain (i.e. *Carlina vulgaris*, *Sanguisorba minor* in CG1

and *Scabiosa columbaria* and *Leontodon hispidus* in CG2) and several populations of the nationally uncommon *Dianthus deltoides* (for which CG7 in the Borders is particularly notable at a national level). The particular richness of CG7 in the Borders is shown by the higher than average number of positive indicator species in this region (Table 39). Additionally, whilst these Annex I H6210 stands were typically small (usually much less 1ha), CG2 at one of the Borders sites was extensive (over 5ha) and may be the best example of CG2 in Scotland.

Most of the grassland belonging to this Annex I type was found to be in overall favourable condition, but in a few places it is in overall unfavourable condition because of negative indicators (particularly abundant gorse) or (less often at reduced positive indicator thresholds, but slightly more so at SCM thresholds) a shortage of positive indicator species.

#### 4.1.2 Annex I habitat H6230 Species-rich *Nardus* grasslands on siliceous substrates in mountain areas

Annex I H6230 is represented here by CG10 stands that are not on limestone and are in mountain areas. A large proportion of the surveyed CG10 qualifies as this habitat. As described under Annex I H6210 above, it differs from the rarer CG1, CG2 and CG7 comprising that habitat especially by the relative frequency of *Agrostis capillaris*, *Anthoxanthum odoratum* and *Potentilla erecta*. The short sward contains *Thymus polytrichus* and sometimes *Helianthemum nummularium* (which however may also occur in U4) and typically also other species such as *Festuca ovina*, *Lotus corniculatus*, *Campanula rotundifolia*, *Succisa pratensis*, *Hypochaeris radicata* and *Leontodon autumnalis*, and mosses which may include *Hylocomium splendens*, *Rhytidiadelphus squarrosus*, *Dicranum scoparium* and *Hypnum lacunosum*. In general there is a greater phytosociological similarity to U4 than is the case with the communities comprising the bulk of Annex I H6210 (CG1, CG2 and CG7).

Annex I H6230 is, like the comprising CG10, scattered throughout Scotland, where it is the main calcareous grassland community at lower altitude, although there was still a concentration in the Borders in this survey. Some CG10 in the Borders contained *Galium steneri*, *Gentianella campestris* and *Pimpinella saxifraga*, whilst elsewhere *Platanthera chlorantha*, *Galium boreale* and *Antennaria dioica* occurred. Recorded CG10 was more often the drier CG10a sub-community, but the damp CG10b sub-community also occurred in the wetter north-west.

The majority of Annex I H6230 was assessed as favourable overall (at reduced positive indicator thresholds), with negative indicators (bracken and rank grasses) causing failure at four sites in Borders, and lack of positive indicators at one site in Aberdeenshire. Using SCM positive indicator thresholds, however, a further six sites fail overall because of insufficient positive indicators.

#### 4.1.3 Annex I habitat H6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinia caerulea*)

This Annex I habitat type, as found in this survey, equates entirely with the M26 NVC community. (M24 would also constitute this habitat type but it has been recorded in Scotland extremely rarely and was not found in this survey). M26, a nationally uncommon community, was recorded at seven sites in Lochaber and Skye, on damp to wet soils on level to gently sloping ground. It resembles M25c in that tussocks of *Molinia caerulea* are abundant to dominant and are accompanied by an assemblage of herbs such as *Potentilla erecta*, *Succisa pratensis*, *Viola palustris*, *Galium palustre*, *Filipendula ulmaria*, *Epilobium palustre*, *Cirsium palustre*, *Lotus pedunculatus*, *Achillea ptarmica*, *Angelica sylvestris*, *Ranunculus acris*, *Lychnis flos-cuculi*, *Caltha palustris*, *Valeriana officinalis*, *Parnassia*

*palustris*, *Geum rivale* and *Centaurea nigra*. The stands classed in this survey as M26 were assigned to the *Festuca rubra* sub-community M26b and were separated from M25 because they contained *Crepis paludosa* and/or *Trollius europaeus*. Most of this M26 was assessed as being in favourable condition; the only exception was a stand that could not be accessed properly, so no condition assessment could be made.

There is some disagreement amongst experienced surveyors as to what constitutes M26, and therefore how much Annex I H6410 exists in Scotland. This is expanded upon in Appendix 3 under M26. The M26 in this survey was recorded by one surveyor, who actually recorded more M26 than the seven stands noted above. Based on the widely recognised and extensive NVC experience of one of the authors, we have taken the step of reassigning those M26 records which were described as having sparse or even absent *Molinia* but plentiful *Juncus acutiflorus* to the M23 community, reasoning that although these stands did contain plants such as *Crepis paludosa* or *Trollius europaeus*, most experts would accept that a paucity of *Molinia* precludes classification as M26. The seven M26 stands noted above have abundant *Molinia* as well as plants such as *Crepis* and *Trollius*. The authors contend, however, that it is still debatable whether these should be referred to M26. The reasoning for this is described in Appendix 3 under M26, and if those arguments were to be accepted, then no M26 (and by extension no Annex I H6410) would be considered to have been recorded during this survey. This would imply that M26 is much scarcer in Scotland than some distribution maps would suggest.

#### 4.1.4 Annex I habitat H6520 Mountain hay meadows

Annex I H6520 is represented in Britain only by the MG3 NVC community. This uncommon community was infrequent in this survey, having been found at only 16 sites. MG3 is unimproved neutral grassland which generally resembles MG5 (see below) but with the herb assemblage including *Geranium sylvaticum*, *Trollius europaeus* or *Cirsium heterophyllum*. It follows from this that MG3 has a northern, upland distribution in Britain. It is therefore not surprising that the sites where it was found in this survey are almost all in areas with a cool and/or wet, upland type of climate: in Aberdeenshire (along the River Dee, with only the most downstream sites being in more of a lowland area), Morayshire, Lochaber, Skye, Stirlingshire (where one of the three sites is in a lowland area near Dunblane) and Dumfries & Galloway (quite well into the hills, between Dumfries and Sanquhar).

Most of the MG3 found in this survey has a flora largely shared with MG5 (but including *Geranium sylvaticum*, *Trollius europaeus* or *Cirsium heterophyllum*) but is not very species-rich and often contains much *Arrhenatherum elatius* and/or *Dactylis glomerata*. These rather tall, rank examples of MG3 belong to the *Arrhenatherum elatius* sub-community MG3c. Some MG3 found in Lochaber and Skye is less rank and rather more species-rich, and belongs to the *Briza media* sub-community MG3b.

Most of the MG3 found in this survey was in unfavourable condition as a result of insufficient grazing or mowing; it was too tall and contained too much in the way of rank grasses such as *Dactylis* and *Arrhenatherum*. At only four sites was the MG3 found to be in favourable condition: two of these are in Lochaber, one is in Aberdeenshire and one in Stirlingshire. The recorded MG3 stands were noticeably small and/or narrow, average stand area being only 0.25 ha.

There were previous records of MG3 from an additional six sites. At one of these (in Lochaber) the MG3 appears to have been lost since the previous survey. At the other five sites (in Renfrewshire, Fife and the Borders) the old MG3 record is considered to be erroneous and, where it is possible to tell from the original survey where it was supposed to be, its place mostly appears to have been taken in 2010-2011 by MG5.

## 4.2 Summaries of the distribution and nature of surveyed BAP Priority lowland grasslands

### 4.2.1 Lowland calcareous grassland (LCG)

This BAP habitat takes in all of the calcareous grassland found in this survey (CG1, CG2, CG7 and CG10, part of which constitute Annex I H6210 and Annex I H6230). The abundant low mats and patches of *Thymus polytrichus* (commonly accompanied by similar-looking mats of *Helianthemum nummularium*) are a particularly defining feature separating this BAP habitat from other habitats at these sites. *Festuca ovina* is abundant in the grassland swards and is accompanied by varied combinations (depending on the NVC community) of *Koeleria macrantha*, *Trisetum flavescens*, *Helictotrichon pratense*, *Briza media*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Carex caryophyllea* and *C. flacca*. There is also a good representation of low-grown herbs including *Lotus corniculatus*, *Pilosella officinarum*, *Plantago lanceolata*, *Prunella vulgaris*, *Galium verum*, *Campanula rotundifolia*, *Arenaria serpyllifolia*, *Sedum acre*, *Trifolium striatum*, *Anthyllis vulneraria*, *Potentilla erecta*, *Hypochaeris radicata*, *Leontodon autumnalis* and *Taraxacum* agg. Mosses are quite common and include *Hypnum lacunosum*, *Hylocomium splendens*, *Polytrichum juniperinum*, *Brachythecium albicans*, *Bryum capillare* and *Grimmia pulvinata*.

These grasslands were found widely throughout the areas covered by this survey. Regional variation is such that the CG10 community is quite common (43 sites) and very widespread but the more strictly lowland CG1, CG2 and CG7 were scarcer (25 sites, the majority being CG7) and found only in the south-east of Scotland. CG10 is common in NW Britain, so its frequent occurrence in this survey is expected, as is the south-east distribution of CG1, CG2 and CG7 given that they are communities of lowland areas with a relatively warm, dry climate. Stands were usually small, which is typical of the wider occurrences of these communities. However, there were five CG10 stands in the Borders larger than 1ha, and one CG2 stand of over 5ha also in the Borders which may be the best example of CG2 in Scotland.

This BAP habitat is of high conservation value in that (a) much of the vegetation is very species-rich, unimproved grassland and (b) it includes, in south-east Scotland, populations of southern species that are rare this far north in Britain (i.e. *Carlina vulgaris*, *Sanguisorba minor*, *Scabiosa columbaria* and *Leontodon hispidus*) or uncommon in Britain generally (*Galium sternerii*, *G. boreale*, *Platanthera chlorantha*, *Gymnadenia conopsea*, *Gentianella campestris*, *Antennaria dioica* and *Dianthus deltoides*). Refer also to the above summary for Annex I H6210, which contains additional points concerning CG1, CG2 and CG7, which are also contained within the Lowland Calcareous Grassland BAP habitat.

Most of this grassland was found to be in favourable condition, but in a few places it was in unfavourable condition because of abundant gorse or (rarely) a shortage of positive indicator species.

### 4.2.2 Upland hay meadows (UHM)

This BAP Priority habitat comprises only MG3 and is thus equivalent to the Annex I H6520 habitat – refer to the above summary for Annex I H6520.

### 4.2.3 Lowland meadows (LM)

In Scotland this BAP habitat includes two NVC types, neither of which constitutes Annex I habitat: MG5 *Cynosurus cristatus*-*Centaurea nigra* meadow and pasture and MG8 *Cynosurus cristatus*-*Caltha palustris* grassland; only one stand of the latter was found. This is short unimproved neutral grassland on well-drained to wet soils, on level to moderately sloping ground. The grass swards consist of *Cynosurus cristatus*, *Festuca rubra*, *Holcus*

*lanatus*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Poa pratensis* and *Trisetum flavescens*. They are accompanied by an abundance of mesotrophic herbs including *Centaurea nigra*, *Plantago lanceolata*, *Trifolium pratense*, *T. repens*, *Ranunculus acris*, *Succisa pratensis* and *Rumex acetosa*. In addition the drier MG5 includes *Rhinanthus minor*, *Lathyrus pratensis*, *Galium verum*, *Lotus corniculatus*, *Prunella vulgaris*, *Hypochaeris radicata*, *Leontodon autumnalis*, *Pimpinella saxifraga*, *Leucanthemum vulgare*, and the wetter MG8 includes *Caltha palustris* (abundant), *Equisetum palustre*, *Potentilla anserina*, *Tussilago farfara*, *Montia fontana*, *Carex panicea*, *Juncus articulatus*, *Cirsium palustre*, *Cardamine pratensis* and *Ranunculus flammula*.

Floristically some Lowland meadow comes close to the Upland hay meadow and Lowland dry acid grassland BAP types. Upland hay meadow differs in having *Geranium sylvaticum*, *Trollius europaeus* or *Cirsium heterophyllum*. Lowland dry acid grassland typically differs in having at least one of *Galium saxatile*, *Rumex acetosella*, *Deschampsia flexuosa*, *Nardus stricta* and the mosses *Polytrichum piliferum*, *P. juniperinum* and *Ceratodon purpureus*, and is mainly on thinner, more acid soils, commonly extending onto steeper slopes than those with Lowland meadow.

Almost all of this BAP type here is MG5 (83 sites scattered widely across Scotland), with MG8 found at only one site (in Morayshire). The reasonable frequency of MG5 in this survey tallies with its widespread though somewhat uncommon known distribution in Scotland; it is not however anywhere near as common in this survey as U4 or M23, which also reflects the wider situation. That its extent is not great considering its fairly frequent occurrence is in accord with the history of losses of unimproved neutral grassland in the last 50 years or so to species-poor grassland (either improved MG6/MG7 or non-NVC species-poor grassland – see ‘Species-poor grassland with no NVC equivalent’ below), by treatments including reseedling, application of fertiliser or simply overgrazing. Some of the MG5 surveyed for this study is managed as permanent pasture, some as hay meadow and at some sites it is currently unmanaged. At nearly half of the MG5 sites it was found to be in favourable condition. Where condition was unfavourable this was due to a combination of shortage of positive indicator species, insufficient cover of forbs or too much cover of negative indicators. These factors typically combine and appear to result from both under-management and agricultural intensification.

#### 4.2.4 Lowland dry acid grassland (LDAG)

This BAP habitat as found in this survey consists of two generally unimproved acid grassland communities (U1 and U4) whose short swards include abundant *Festuca ovina* and *Agrostis capillaris*. Other grasses include *Anthoxanthum odoratum*, *Holcus lanatus*, *Festuca rubra*, *Cynosurus cristatus*, *Danthonia decumbens*, *Nardus stricta*, *Deschampsia flexuosa*, *Aira praecox* and *A. caryophyllea*. Small herbs are very common and include *Potentilla erecta*, *Galium saxatile*, *G. verum*, *Campanula rotundifolia*, *Viola riviniana*, *V. lutea*, *Veronica chamaedrys*, *V. officinalis*, *Plantago lanceolata*, *Rumex acetosa*, *R. acetosella*, *Lathyrus linifolius*, *Lotus corniculatus*, *Pilosella officinarum* and *Aphanes arvensis*. Mosses are common, especially *Rhytidiadelphus squarrosus*, *Hylocomium splendens*, *Thuidium tamariscinum*, *Pseudoscleropodium purum*, *Dicranum scoparium*, *Polytrichum piliferum*, *P. juniperinum* and *Ceratodon purpureus*.

These grasslands occur on well drained, more or less acidic soils on steep to gentle slopes. They vary from dense, continuous swards of the U4 community (very widespread and common, and recorded at 119 sites) to more patchy swards of U1 on thinner soils (at 27 sites, mainly in the Borders and Fife). The high frequency and widespread occurrence of U4 in this survey agrees with its very common status in Scotland, especially in unenclosed upland areas but also in enclosed farmland within upland and lowland parts of Scotland. U1, similarly to the rarer calcareous grasslands in Scotland, is predominantly a community of

lowland areas with a relatively warm, dry climate, hence the pronounced south-eastern distribution in this survey; stands were typically small which is typical of the wider occurrences of this community.

Much of this BAP habitat as found in this survey is of high conservation value in that (a) it is unimproved and (b) some of it is very species-rich, including a notable concentration of sites with the nationally uncommon, herb-rich U4c sub-community in the Borders. U4c is not common in Britain as a whole. It was originally described from southern Britain, with *Stachys officinalis* as one of the main species distinguishing it from other sub-communities of U4. However, some northern British examples of U4 lacking *S. officinalis* have a rich enough assemblage of other U4c 'preferentials' (especially *Galium verum*, *Lathyrus linifolius*, *Viola lutea* and *Helianthemum nummularium*) to be clearly assigned to this sub-community. In Scotland U4c is an uncommon and predominantly eastern sub-community, recorded mainly from the Borders and the south-east Highlands (mainly in limestone areas in Perthshire). The relative richness of U4c in the Borders contributes to the high average number of positive indicator species recorded in samples of the U4 community as a whole among the Borders sites (Table 39). However, elsewhere during this survey some of the U4 was found to be heavily grazed species-poor U4b of limited interest, not all of which was noted in the original surveys (which generally highlighted more notable grassland features).

Most of the surveyed grassland in this BAP habitat type is in favourable condition, but some was classed as unfavourable, mainly because of an abundance of negative indicator species such as *Pteridium aquilinum*, *Lolium perenne*, *Dactylis glomerata* and *Senecio jacobaea*, or because it had too few positive indicator species. The increased rate of overall failure using SCM positive indicator thresholds reflects the frequency of lower quality U4 including U4b.

#### 4.2.5 Purple moor-grass and rush pasture (PMRP)

This BAP habitat occupies wet, level or gently sloping ground and is widespread and very common in this survey. Most of it is M23 rush mire (114 stands); most of the remainder is M25 *Molinia* grassland/mire (37 stands, found mainly in western areas), and also included are the seven records (from Lochaber and Skye) of M26 *Molinia* mire (which constitute Annex I H6410 habitat – but see above under 'Annex I H6410' and below under 'Recording of M26 in Scotland'). Soils evidently vary from acidic to quite base-enriched. That M23 was so common in this survey is in line with its very widespread occurrence throughout Scotland, especially towards the west, and especially in unenclosed areas on upland margins but also in enclosed farmland within upland and lowland regions. The habitats of M23 within the surveyed sites are typical of those in Britain generally: mostly in wetter depressions, some of which are long and narrow. M25 is a community of mainly wetter, western parts of Britain which is reflected in the distribution of its occurrences in this survey; its restricted occurrences in this survey were not surprising because the great bulk of British M25 is on unenclosed hill ground: it is much less common in enclosed and more intensively managed farmland environments such as those in this survey. The rarity of M26 in this survey reflects its true rarity in Scotland – refer to the summary for 'Annex I H6410' above and 'Recording of M26 in Scotland' below.

The vegetation of this BAP habitat is dominated by *Juncus acutiflorus*, *J. effusus* or *Molinia caerulea* (or mixtures of these), with a varied associated flora including species such as the herbs *Galium palustre*, *G. uliginosum*, *Filipendula ulmaria*, *Cirsium palustre*, *Epilobium palustre*, *Cardamine pratensis*, *Lotus pedunculatus*, *Achillea ptarmica*, *Angelica sylvestris*, *Ranunculus acris*, *R. repens*, *Rumex acetosa*, *Lychnis flos-cuculi*, *Mentha aquatica*, *Caltha palustris*, *Valeriana officinalis*, *Potentilla palustris*, *Hydrocotyle vulgaris*, *Geum rivale*, *Succisa pratensis*, *Viola palustris*, *Potentilla erecta*, *Pedicularis sylvatica*, *Narthecium ossifragum*, *Crepis paludosa* and *Trollius europaeus*, the grasses *Holcus lanatus*, *Festuca rubra*, *Agrostis capillaris*, *Anthoxanthum odoratum* and *Deschampsia cespitosa*, the sedges

*Carex nigra*, *C. panicea*, *C. flacca*, *C. echinata* and *C. disticha*, and the mosses *Rhytidiadelphus squarrosus*, *Calliergonella cuspidata*, *Brachythecium rivulare* and *Sphagnum* spp.

This BAP habitat is more varied and extensive in the west, where it includes both *Juncus* and *Molinia* mires, some of which contain species absent from the east such as *Carum verticillatum*. Eastern examples are almost all *Juncus* mire.

Less than half of the existing surveyed stands of this BAP habitat were favourable overall even at reduced positive indicator thresholds (only 25% at SCM thresholds). This is a reflection of the frequency of species-poor quality M23 (42% were found to be in favourable condition at reduced thresholds) and, to a lesser extent, M25 (57% favourable at reduced thresholds). By far the commonest reason for this condition failure was an insufficient representation of positive indicator species. For discussion of positive indicator species in M23, see 'Discussion of M23 positive indicators' below. Note, however, that over two thirds of the unfavourable M23 stands were not the principal interest of the site (and half of them were not noted during the original surveys in the 1980s/1990s). Most of the M26 was in favourable condition; the only exception was a stand that could not be accessed properly, so no condition assessment could be made.

#### 4.3 Discussion of M23 positive indicators

M23 was found to be in favourable condition at only 48 sites in this survey (40% of all M23 sites). By far the commonest reason for this condition failure was an insufficient representation of positive indicator species. At many sites the M23 was indeed quite species-poor. However, some stands of M23 in this survey were found to have at least a moderately rich flora including a good range of characteristic mesotrophic herbs, but still with an unfavourably low representation of M23 positive indicator species. Surveyors often felt that the positive indicator attribute for M23 was rather unfair in this respect, especially as there are surprisingly few species listed here as positive indicators. A comparison of numbers of species for this attribute for M23 and two related mire communities are shown in Table 40 below.

M23 and M25 each require the same numbers of positive indicator species to pass for this attribute, yet the total number of positive indicator species listed for M25 is nearly twice as many as for M23. For this reason alone one may expect that this attribute will tend to be passed more easily for M25 than for M23. This may explain why the SCM target for positive indicator species was passed in only 18% of sampled stands of M23 compared with 43% of sampled stands of M25.

Table 40. Comparison of positive indicator attribute targets for PMRP communities

|                                                                             | M23                                                                                                           | M25    | M26                                                                                                           |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------|
| Total no. positive indicators (excluding <i>Juncus</i> and <i>Molinia</i> ) | 12                                                                                                            | 23     | 17                                                                                                            |
| SCM target for these positive indicator species                             | 2 spp. frequent AND<br>3 spp. occasional<br>throughout sward or<br>locally abundant over<br>>10% of the sward | As M23 | 2 spp. frequent AND<br>4 spp. occasional<br>throughout sward or<br>locally abundant over<br>>10% of the sward |
| Reduced target for these positive indicator species                         | 1 spp. frequent AND<br>3 spp. occasional<br>throughout sward or<br>locally abundant over<br>>10% of the sward | As M23 | As M23                                                                                                        |

The following species are listed as positive indicators for M25 but not for M23: *Anagallis tenella*, *Angelica sylvestris*, small blue-green *Carex*, *Calluna vulgaris*, *Centaurea nigra*, *Cirsium dissectum*, *Erica tetralix*, *Eupatorium cannabinum*, *Narthecium ossifragum*, *Pedicularis sylvatica*, *Potentilla erecta*, *Serratula tinctoria*, *Sphagnum* sp., *Succisa pratensis*, *Valeriana dioica* and *Valeriana officinalis*. Among these species the following are about equally common in M23 and M25, and might serve as positive indicators for M23 just as well as they do for M25: *Angelica sylvestris*, small blue-green *Carex*, *Centaurea nigra*, *Succisa pratensis*, *Valeriana officinalis* and (at least within its geographical range which extends north only into the south-eastern part of Scotland) *V. dioica*. The same is true of some additional mesotrophic herbs not currently listed as positive indicators for either community (though the first three are positive indicators for M26): *Geum rivale*, *Crepis paludosa*, *Trollius europaeus* and *Parnassia palustris*.

Where M23 was found to be in unfavourable condition it is also relevant to consider its landscape context. Many occurrences of M23 at sites in the Borders and Fife are 'chance' occurrences within sites identified as being of botanical interest because of their drier grasslands (mainly U1, U4, CG7, CG10 and MG5). Species-poor, unfavourable M23 in such places may not be an indication of adverse management, especially if the management is maintaining the drier grasslands in good condition (which it is at many sites in these areas). Unfavourable condition of M23 is more significant at sites where this community occupies a larger proportion of the total site area and where there are fewer other priority grassland NVC types; surveyed sites of this description are mainly in western areas of Scotland.

#### 4.4 Species-poor grassland with no NVC equivalent

The species-poor neutral grassland described here does not constitute Annex I or BAP Priority habitat, but is mentioned here because it can be floristically close to the MG5 and U4 NVC communities. It is too species-poor to be clearly assigned to either MG5 or U4, and has too little *Lolium perenne* to be classed as MG6 improved grassland. It typically has rather even, homogenous swards of grasses in which *Festuca rubra* and *Holcus lanatus* are often especially abundant but frequently mixed with others including *Cynosurus cristatus*, *Agrostis capillaris*, *Anthoxanthum odoratum* and *Poa pratensis*. In some places *H. lanatus* is dominant. *H. mollis* is very locally dominant. *Trifolium repens* can be very common but herbs typical of MG5 and U4 are generally very sparse. There can be a thin scatter of mesotrophic herbs such as *Trifolium pratense*, *Plantago lanceolata*, *Centaurea nigra*, *Rhinanthus minor*, *Leucanthemum vulgare*, *Hypochaeris radicata*, *Ranunculus acris*, *R. repens* (co-dominant with *Holcus lanatus* in some places), *Prunella vulgaris*, *Rumex acetosa*, *Lathyrus pratensis*, *Stellaria graminea*, *Cerastium fontanum* and *Lotus corniculatus*, but too sparsely and infrequently for the vegetation to be satisfactorily classed as MG5. The grassland can resemble the more species-poor swards of U4b, especially where *Potentilla erecta* occurs, but again *P. erecta* and any other U4 indicators are too scarce for the grassland to be satisfactorily classed as U4.

Grassland of this general description does not fit into any NVC community, but since the publication of the NVC it has been found widely in Britain, especially in the west. In many cases it probably corresponds to the provisional '*Festuca-Holcus*' community which has been described in Cooper & MacKintosh (1996) and was included in the annotated conspectus of the NVC review by Rodwell *et al* (2000), but it may be somewhat wider in its floristics, approaching MG5 more closely. A good deal of this 'semi-improved neutral grassland' found in these surveys is in Lochaber, but it was also found in Skye, Aberdeenshire, Morayshire, Stirlingshire and Dumfries & Galloway. It is generally on well-drained, level to gently sloping ground, and some of it is in fields managed as hay meadow. At least some of this in the Highland region was formerly referred to MG5 but was regarded by the surveyor for this survey as too poor now for that community. Several small crofting sites with this sort of vegetation near Corran were seen by the surveyor in 2010 and also in

2011 by Ben Averis, who concurred that some of the grassland was indeed too poor to satisfactorily assign to MG5 or U4, but was not MG6 either. This species-poor grassland appears in some cases to have been derived from MG5 or U4 by overgrazing and/or sowing of grass, thus indicating loss of these communities. At least one very poor *Holcus lanatus*-dominated example occupies a field which has in the fairly recent past been completely ploughed (judging by aerial photography).

As this is a 'non-NVC' type of vegetation for which there are not yet any published definitions or floristic tables, there might be some variation among surveyors in terms of the floristic boundaries between this vegetation and both MG5 and U4. It is possible that some of this 'non-NVC species-poor neutral grassland' might be classed as such by one surveyor with a stricter definition of MG5 and U4, but as a species-poor example of MG5 or U4 by another surveyor. If so, some parts of those grasslands classed as species-poor neutral grassland (particularly in Highland where most frequently recorded) might be interpreted by another surveyor as unfavourable MG5 or U4. Where the condition of this grassland has been assessed using the forms for MG5 or U4 it invariably fails because of the low representation of positive indicator species, the over-dominance of grasses (with insufficient forb cover) or the over-abundance of *Holcus lanatus*. The loss of some MG5 (or U4) to this species-poor grassland will have contributed to calculations of decrease in extent.

#### **4.5 Change in extents of Annex I and BAP Priority habitats**

This section employs the results of the second area analysis described in the Results section, which incorporates surveyor judgement as to the likelihood of change, which we believe provides a more accurate picture of changes in extent.

Much of the original survey work was done in the early years of grassland NVC classification, so early surveyors would have had less experience of classifying grassland to NVC type than many current surveyors. Some of the original NVC determinations were made retrospectively and not in the field at the time of survey. It is not surprising, therefore, that surveyors for this study sometimes found constituent NVC communities belonging to different communities than those to which they were originally assigned, but which appear unlikely to have actually belonged to the previously assigned community. A common example of such misclassification was MG5 instead of U4 (sometimes with CG10). It seems most likely that these stands have belonged to the same NVC community throughout this whole period, but at first glance there can appear to be a drastic change in the area of constituent NVC communities at such sites.

The following is given as a good example of a site where change is deemed to have been negligible despite first appearance suggesting otherwise. At a site in the Borders the original survey mapped an extent of MG5 along a slope on one side of the field. During the survey for this study, it was considered that the MG5 was a mix of U4 with some CG10, and furthermore that there were several other, albeit much smaller, parallel ridges in the field with similar vegetation. As the field is known to have been managed as grazing land for a very long period of years, and the ridges unlike the flat areas could not be significantly improved, it is likely that constituent NVC communities on this site have not much changed in type or extent, although the data report otherwise at first glance. It is thought likely that initial apparent 'changes' at many other sites are similarly misleading.

Another common problem is the less detailed mapping of many of the original surveys, making area measurement inaccurate. Some original surveys did not map site boundaries or community boundaries clearly, sometimes only indicating rough locations of features of interest. The base maps available in the 1980s were often of poor quality or small scale and the mapped communities were measured by hand using a dot grid in pre-digital mapping days. Sometimes only grassland communities were mapped, and other habitats such as

bracken, scrub and woodland were omitted or shown as scattered symbols (such as crosses) for which area measurements may have been omitted or could only be crudely estimated. Finally, habitats which exist only as small patches can easily be mapped as too large, and this results in an apparent loss when the later survey is more accurate, for example through the use of aerial photographs. All these factors tend to conspire towards overestimation of the original survey areas rather than underestimation. Area underestimation has also occurred, however, in some cases the result of newly-recorded constituent NVC communities, generally small in extent, which were probably not noted previously because they were not thought of significant interest (such as small patches of poor M23 on sites whose interest is dry grasslands).

As a result of the above factors there are many instances of sites showing, at first glance, a degree of change in mapped area of constituent NVC communities where, in the surveyors' opinions, there is not likely to have been a significant change.

The second corrected area analysis described in the Results section attempts to minimise the above problems as best as possible by incorporating the surveyors' judgements as to the likelihood of change, and accounting for erroneous original NVC records. Whilst this analysis states a loss of 109ha of total constituent NVC area, the real loss is probably substantially less than 100ha, and, though it is not possible to state the loss more precisely, around half of that loss has probably occurred on just six sites (three in Dumfries & Galloway, two in Moray, and one in Borders). This means that about 52ha was calculated to be lost as a result of one large plantation in Dumfries & Galloway (causing 15ha loss of M25), under-management at a site in Dumfries & Galloway and another in Moray (causing development of MG1, scrub and bracken, with resultant loss of 5ha and 7.5 ha of U4), and agricultural intensification at one site in each of Dumfries & Galloway, Moray and Borders (causing loss of 9ha MG5, 3.5ha MG5 and 12ha U4, though the first is thought to be a significant overestimate). Of the remaining 57ha, 22ha is accounted for by numerous small losses of MG5 in Highland, largely due to agricultural intensification. This leaves 35ha of loss spread about more widely in smaller amounts.

In terms of rate of change, the second area analysis results in an apparent loss of constituent NVC area of about  $-0.7\%/yr$ . For the same reason given above, this is probably also an overestimate. The majority of the loss is attributable to MG5 and U4, with appreciable loss also of M25, in agreement with the comments in the previous paragraph. Since around half of this loss appears to result from just six sites, the rate of change outside these six large impact sites would be around  $-0.4\%/yr$ . However, the rate of  $-0.7\%/yr$  is considered to be representative of the situation throughout Scotland. These figures apply to losses for surveyed BAP Priority lowland grassland, but not to Annex I habitats because these appear to have suffered negligible loss with the one exception of Annex I H6520 (MG3) – see the next section below.

#### 4.5.1 Annex I losses

Since none of the above larger losses involve Annex I habitat, it is not unexpected that losses in extent of Annex I habitats appear to be slight overall. Overall percentage losses of H6210 (CG1, CG2, CG7 and a small part of CG10 – nearly all in south-east Scotland) are low at less than 2%, and amount to less than 0.25ha; such losses as appear to have occurred are the result of limited scrub encroachment (including at the one CG1 site), overgrazing by horses at one site in Fife, and development of MG1 at another Fife site (a notable site with patches of CG7 containing *Dianthus deltoides*). These calcareous communities are often situated on localised rocky or steep ground that is not conducive to strong agricultural improvement, which contributes to the minimal losses and the very high proportion of overall favourable stands for this habitat group.

There is a very limited amount of surveyed M26 in Highland, and there has been negligible net loss of this habitat (1.5%, amounting to only 0.05ha; these figures may be more inaccurate than some since they are based on only seven stands). It appears that small losses may have occurred because of succession to woody vegetation, but the existing vegetation is generally in excellent condition.

The MG3 corresponding to Annex I habitat H6520 (in the stands surveyed for this study) is generally coarse and often suffers from unfavourable negative indicators (typically coarse grasses), often resulting from under-management. Overall net losses of MG3 amount to 19%, but this only represents about -1ha, and largely results from just two small MG3 stands at two Highland sites, one of which is newly recorded but is thought to have suffered some loss to woodland encroachment, and another which is lost completely but for which there is some doubt as to its original quantity and location. Smaller losses in Aberdeenshire are due to under-management at River Dee sites and resulting succession to MG1 and woody vegetation. Any proposed management of MG3 at some of the latter sites especially may prove problematic because of difficult river bank locations.

#### *4.5.2 BAP Priority losses*

With regard to Upland Hay Meadow, refer to Annex I H6520 under 'Annex I losses' above, as this habitat is equivalent to Upland Hay Meadow (both comprising MG3).

Lowland Meadow (entirely MG5 in this survey apart from one MG8 stand) shows the greatest loss, at 39%, and also the greatest loss of extent at -44ha. The largest area loss occurred in Highland with 22ha loss of MG5 as a result particularly of agricultural intensification but also involving some under-management. Loss of 9ha of MG5 in Dumfries & Galloway also appears to involve agricultural intensification but is thought to be a large overestimate. These two losses contribute greatly to the overall loss of constituent NVC area. The loss of 22ha of MG5 at 28 Highland sites is thought to be more reliable, and is reflected by the most frequent recording of non-NVC species-poor grassland (see above) in this region, which appears to be at least partly derived from MG5 (or U4) by agricultural intensification. Smaller MG5 losses can be broken down as follows: 6 South Ayrshire sites (agricultural intensification, under-management, plantation and development); 4 Dumfries sites (under-management and overgrazing); 3 Moray and 3 Renfrewshire sites (agricultural intensification and under-management); 3 East Ayrshire sites (overgrazing, plantation and under-management); and 3 Fife sites (under-management). At the latter Fife sites under-management for grassland sometimes occurs where there is heath vegetation, and although undergrazing does not favour grassland it does favour heath, which, being a scarce resource in lowland Fife, is probably rightly valued more highly than the grassland.

For Lowland Dry Acid Grassland (U1, U4) there is a 10% area reduction, resulting from losses of U4, one of the two most frequently encountered constituent NVC communities. This represents the second largest loss of extent of the constituent NVC communities, at 40ha. This is affected heavily by loss of U4 at 2 stands in Moray from under-management and at one Borders site from improvement, which contribute greatly to the overall loss of constituent NVC area. Other significant percentage area losses occur in Highland (10 stands, mostly small, from a mix of under-management and agricultural intensification), Renfrewshire (7 stands from a mix of under-management, agricultural intensification, plantation and development), West Lothian (4 stands from a mix of under-management, plantation and development), Dumfries & Galloway (3 stands, primarily from under-management), and North Ayrshire (3 stands from a mix of under-management and agricultural intensification).

Purple Moor-grass & Rush Pasture shows a 9% area reduction, with the third largest area loss of -21ha. By far the biggest reduction is in Dumfries & Galloway and this is mainly due

to one 15ha stand of M25 lost to plantation, which contributes significantly to the overall loss of constituent NVC area; two M23 stands in this region are lost to further plantation and under-management. Significant losses are also apparent in East and North Ayrshire. The former results from losses to M23 and M25 at two sites (primarily to plantation); the latter results from losses of M23 and M25 at four sites (to a mix of agricultural intensification, plantation and under-management). As noted for Annex I H6410 above, there has already been a small amount of loss of M26 to woodland through under-management.

Similarly to Annex I H6210, which forms part of it, Lowland Calcareous Grassland exhibits only a small area reduction, and this mainly results from CG10 losses. The 6.2% reduction of Lowland Calcareous Grassland, which amounts to -2ha, is very heavily affected by the loss of CG10 at one site in South Ayrshire, probably to overgrazing, but it is thought that there would have been very little present originally at this site, and the old area relied upon here in the Lowland Grassland Database is almost certainly a large overestimate, so in fact there has probably been a much lower percentage area loss of CG10 and thus minimal change in overall Lowland Calcareous Grassland area. The reduction in Fife and Borders is due to three sites suffering scrub encroachment; in Aberdeenshire, there is loss at two River Dee sites through under-management and succession to U4, MG1 and scrub. As mentioned above for Annex I H6210 / H6230, the fact that Lowland Calcareous Grassland stands frequently occur in rocky or steep places not conducive to agricultural intensification has undoubtedly helped to minimise losses to the habitat.

#### **4.6 Condition of Annex I and BAP Priority lowland grasslands**

##### **4.6.1 General comments**

In this survey 41% of stands of constituent NVC communities were found to be in overall favourable condition using the standard SCM thresholds for positive indicators, and 58% using the reduced thresholds designed for non-designated sites.

Negative indicators are the main reason that stands which are otherwise favourable at the reduced (or SCM) positive indicator threshold still fail overall. About 16% of stands which are favourable at the reduced positive indicator threshold still fail overall for this reason, and about 15% of the stands favourable at the SCM positive indicator threshold still fail overall.

One might expect some inverse correlation between positive and negative indicator species: rich floras of positive indicators in places with few or no negative indicators. To some extent this is the case: for example among the calcareous grasslands. However, it is interesting that M23 rush mire – a community which is among the poorest for positive indicators – is one of the communities least ‘marred’ by negative indicators. The reason for most M23 failures was the shortage of positive indicator species. On the other hand, many of the unfavourable stands of short grasslands had good assemblages of positive indicators but failed because of an abundance of negative indicators. The commonest negative indicator species encountered generally during this survey were *Cirsium arvense*, *Senecio jacobaea*, *Lolium perenne*, *Trifolium repens*, *Holcus lanatus*, *Arrhenatherum elatius*, *Dactylis glomerata*, *Deschampsia cespitosa* and *Pteridium aquilinum*.

At some sites where M23 rush mire was present in unfavourable condition, drier constituent NVC communities were also present in favourable condition. At these sites it was felt that the unfavourable condition of the M23 need not be seen as an indication of poor site quality or inappropriate management, because the drier grasslands were more notable botanically and must have been the reason why the site was noticed and surveyed in the first place. Many stands of M23 are probably of just incidental occurrence at sites noted for their grassland interest because of their rich drier grassland communities (CG2/7/10, MG3/5 and

U1/4). At such sites it seems best for management to be aimed especially at maintaining the drier grasslands in good condition.

Amongst the other constituent NVC communities that were often newly-recorded (i.e. not noted in the original surveys) is U4. Where U4 was newly-recorded, and was not the result of past confusion of MG5 for U4 (often the case especially in the Borders, where such U4 is often of good quality), it was typically heavily grazed and poor in diversity, corresponding to the U4b sub-community. Sometimes such newly-recorded U4b stands were of significant size (particularly at one Dumfries & Galloway site, where there is a very large area of previously un-noted but poor quality U4b). More extensive recording of U4b may occasionally have resulted in apparent degradation of U4 where richer sub-communities were recorded previously and still exist with the U4b.

For those communities to which it applies, the grass:forb ratio attribute is generally favourable. Of those which are favourable for this attribute, 11% are still unfavourable for positive indicators. The majority of the stands concerned here are MG5 (Lowland Hay Meadow), and also a few MG3 and CG7 stands, scattered widely across Scotland. This implies that for these stands the high grass:forb ratio is the result of abundant forbs not listed as positive indicators, and these are most likely species of no note such as *Ranunculus repens*, *Plantago lanceolata* and *Trifolium repens*; this appears to result from a combination of under-management at some sites and overgrazing/agricultural intensification at others.

The drier neutral grasslands (MG3 and MG5) are the communities found to be most prone to having swards unfavourably tall. Both of these communities can grow into tall, rank swards of relatively species-poor MG1 if left ungrazed for too long. It is perhaps to be expected that unfavourably tall swards should be rare among the drier grassland on thinner soils, because such soils are less suitable for such tall, lush vegetation growth. However, there are localised occurrences of rather rank, overgrown grasslands of communities which normally form shorter swards. For example some U1 has a rather weedy growth of certain negative indicators such as *Dactylis glomerata*, and in the ungrazed part of one Borders site with extensive CG2 some of the CG2 grassland is growing tall in response to the lack of grazing (though these taller patches did not prevent the condition of CG2 at this site as a whole from being classed as favourable).

Litter mats show a similar pattern to vegetation height in that they tend not to build up much in the short grassland NVC types on thin soils (CG2/7/10 and U1/4), but are unfavourably extensive in some stands of the communities of larger plants on deeper soils (MG3, M23, M25 and M26). Excessive litter commonly goes hand in hand with excessive vegetation height and an abundance of negative indicator species.

Bare ground is generally very limited in extent in most of these grassland stands except in the two short grassland communities CG7 and U1, and the single surveyed CG1 stand. Hence it is rarely unfavourably extensive, but in some U1 it is unfavourably sparse (<5%). This seemed an unfair lower threshold because some U1 is quite favourable in all other ways, even though the extent of bare ground is less than 5%. However, as shown on page 8, failure to meet the bare ground target does not lead to an overall unfavourable condition.

Analysis of habitat condition should not be considered in isolation from the area losses that may have taken place (see above). Thus, whilst North Ayrshire has the highest overall rate of favourable condition of stands, at 80%, this is counteracted by a likely significant (although not enormous) loss of BAP acid grassland and rush pasture. Similarly, whilst Highland has an overall level of favourable condition of 59%, there has certainly been a counteracting significant loss of habitat in this area, including loss of Lowland Meadow (MG5) to agricultural intensification. Conversely, the poor overall pass rates in

Renfrewshire, South Ayrshire and East Ayrshire appear to be in line with reflect the probable losses in habitat extent in these regions.

#### 4.6.2 Condition of Annex I habitats

Overall pass rates for Annex I habitats are high except for H6520 (MG3). 63% of all Annex I stands taken together were favourable overall using SCM positive indicator thresholds (74% at reduced thresholds). Note however that, despite this, 39% of stands appeared to show some degree of negative management.

Existing surveyed Annex I H6210 (CG1, CG2, CG7 and a few CG10 stands on limestone) is similarly favourable at both SCM and reduced positive indicator thresholds (79% and 82% respectively). The performance of these communities for positive indicators is higher than overall favourability, a result of negative indicators (particularly in CG1 and some CG7), with positive indicator shortage playing a lesser role in reducing overall favourability. They are 100% favourable for grass:forb ratio, vegetation height and litter layer, and are generally favourable for bare ground too, but a few CG7 stands and the one CG1 stand have too much bare ground (which may be partly due to livestock activity). Where not favourable overall this is generally the result of encroaching gorse, rarely coarse grasses, or (only in two CG7 stands) a shortage of positive indicator species. Given the frequent location of these communities in dry rocky places which are difficult to improve or overgraze, their high favourability is not entirely unexpected. This does not mean that there are no problems with surveyed stands of these communities – over 20% of surveyed Annex I H6210 stands and over 25% of Annex I H6230 stands appeared to be suffering a degree of negative management, primarily under-management, resulting in the negative indicator issues as just mentioned, and limited loss to encroaching scrub and coarse grass; very locally overgrazing has also occurred. Non-native species were recorded at the single CG1 stand in the extreme south-east Borders, where the presence of *Centranthus ruber* was regarded as a negative factor as well as the encroaching scrub.

Overall favourability is also high for Annex I H6230 (CG10 in mountain areas not on limestone), but here there is a larger difference between favourability at SCM and reduced positive indicator thresholds (68% and 85% respectively). This reflects the slightly lower species diversity of CG10 constituting Annex I H6230 compared to Annex I H6210; constituent CG10 stands may differ little from U4 apart from frequent *Thymus polytrichus*, and a number of positive indicators that can be frequent in Annex I H6210 (such as *Dianthus deltoides*, *Koeleria macrantha* and *Helictotrichon pratense*) are absent or rare in CG10 constituting Annex I H6230. Again, favourability of Annex I H6230 is higher for positive indicators alone than overall favourability; this difference is again the result of unfavourable negative indicators, and to a very small degree unfavourable grass:forb ratio. Whilst vegetation height and bare ground are entirely favourable for Annex I H6230, there is a very slight unfavourability for litter layer. Taken as a whole, the surveyed Annex I H6230 is in mostly good condition, but at about 25% of stands there appears to be a degree of negative management, primarily under-management with consequent encroachment of rank grasses, bracken and scrub.

Annex I H6410 (M26) fares best of all constituent NVC communities, being 100% favourable for all applicable attributes. However, there are only seven stands of M26 in this analysis, and there is contention about the identification of M26 in Scotland – see discussion of M26 recording in Appendix 3. Whether this vegetation is regarded as M26 or not, it is clearly of some interest, being in apparently excellent condition and containing species such as *Crepis paludosa* and sometimes *Trollius europaea*. The area involved is, however, small (3.5 ha in the Highlands, averaging 0.5 ha per site). Additionally, despite the favourable condition of these stands, about 50% of them were still identified as being undermanaged because of a

lack of grazing and in some cases possible loss to woodland may have occurred since the original surveys.

Annex I H6520 (MG3) is the least favourable of the Annex I habitats: only 25% of the surveyed stands are favourable, and this is despite being 75% favourable for positive indicators at the reduced thresholds. The low pass rate for MG3 is largely due to negative indicators (principally coarse grasses), although insufficient diversity is also a factor, reflected in some low positive indicator and grass:forb ratio records. A few MG3 stands actually have satisfactory positive and negative indicators but still fail through a poor grass:forb ratio, though more commonly the grass:forb ratio is satisfactory and it is negative indicators that cause failure. The coarse grasses also contribute to the poor performance of the surveyed MG3 for vegetation height, with only 6% favourable, and also results in this community faring amongst the least well for litter layer. This all seems to be largely due to under-management: over 70% of stands appear to be under-managed and much of the surveyed MG3 was not actually 'hay meadow' but rather coarse unmanaged grassland with *Geranium sylvaticum* and other indicators such as *Cirsium heterophyllum*, much of this being the poorer MG3c sub-community. Just under half of the surveyed MG3 was at river side sites by the River Dee, some of which are naturally difficult to manage, and others of which are cut periodically for fishing purposes but often still have a high proportion of coarse grass. It should be noted that a degree of loss of MG3 appears to have occurred – see above.

#### 4.6.3 Condition of BAP Priority habitats

Regarding Upland Hay Meadow (MG3), refer to Annex I H6520 under 'Condition of Annex I habitats' above, which is exactly equivalent.

Lowland Calcareous Grassland is generally in good condition, with 75% favourable at SCM positive indicator thresholds, and 85% at reduced thresholds, which again is not unexpected given that the generally favourable Annex I H6210 communities represent a quarter of this BAP habitat, and the remainder is CG10 which typically also exists in rocky places which are often difficult to improve or overgraze. (For further information on Annex I H6210 refer to Annex I H6210 under 'Condition of Annex I habitats' above). The CG10 is the only calcareous community which suffers slight unfavourable condition of the litter layer, the result of a single River Dee site which is unmanaged and succeeding to MG1 and scrub, and where positive and negative indicators are thus also unfavourable. At two sites CG10 suffers too much bare ground as a result of livestock poaching. As noted above, the high favourability of the calcareous grasslands does not imply they are without problems – there are some negative indicator issues (scrub encroachment mainly, rarely coarse grass development), limited overgrazing, and there has been limited loss, mainly of CG10 at six sites from overgrazing and under-management. In all, over 25% of Lowland Calcareous Grassland appears to suffer some degree of negative management, primarily under-management.

Lowland Meadow (represented here entirely by MG5 except for a single MG8 stand) has one of the lower overall pass rates, at 35% favourable overall at SCM positive indicator thresholds (49% favourable overall at reduced thresholds). It has a higher positive indicator favourability of 46% (74% at reduced thresholds), but performs less well for negative indicators (69%) and vegetation height (64%), mainly reflecting local under-management and consequent development of coarse grasses. For a small number of MG5 stands both positive and negative indicators were actually satisfactory and it was a poor grass:forb ratio that resulted in failure. Failure of the existing surveyed MG5 appears to be sometimes the result of overgrazing but more commonly under-management. The one MG8 stand (in Moray) failed through insufficient diversity. It should be remembered however that some MG5 appears to have been lost to non-NVC species-poor grassland via agricultural intensification, especially in the Highlands (see 'Species-poor grassland with no NVC

equivalent' above), and loss to this form of negative management is reported to be a possible issue at one third of surveyed stands. Indeed, MG5 appears to show the greatest degree of loss of all constituent NVC communities. As discussed above, some surveyors might refer such species-poor grassland to poor MG5 (or U4) but such grassland inevitably fails the MG5 (or U4) assessment through insufficient positive indicator frequency. The combination of area loss and assessment failure of over half the existing surveyed MG5 stands arguably indicates that this community (and therefore also the Lowland Meadow BAP habitat) has fared the least well of the surveyed habitats.

A reasonable percentage of Lowland Acid Grassland appears to be favourable overall, at 47% using SCM positive indicator thresholds (66% at reduced thresholds). This was much more due to U4 failure than U1 failure. U1 failures were relatively few and resulted from both insufficient diversity and negative indicators. U4 failures were caused by the same problems, a result of both the presence of some heavily grazed poor U4b, and elsewhere under-management causing invasion of bracken, scrub and coarse grass. Such under-management also results in the unfavourable litter layers of 11% of U4 stands. Agricultural intensification and under-management appear to have had some degree of impact at 13% and 28% of surveyed stands respectively. Given that the reduced positive indicators threshold for U4 can be satisfied just by having frequent *Potentilla erecta* and *Galium saxatile*, and nothing else at all, the 20% of the surveyed U4 stands that fail even on reduced positive indicators are clearly very poor indeed. We are aware that some of the recorded U4b was not noted in the original surveys, which instead highlighted other and more notable grassland features. There is, however, more good quality U4 than poor U4 in the surveyed stands, and of special note are the occurrences of diverse U4c in the Borders (see the summary description for Lowland Acid Grassland above). On the other hand, it should be noted that estimated losses of U4 are second only to losses of MG5 (see 'BAP Priority losses' above).

Purple Moor-grass & Rush Pasture, the most abundant of the surveyed habitats after Lowland Acid Grassland, primarily because of the frequency of M23, is 25% favourable overall at SCM positive indicator thresholds (48% at reduced thresholds). Failure is almost entirely due to insufficient diversity, particularly of M23 but also of M25; only a small proportion of stands (5%) fail on negative indicators. The 100% favourability of the few M26 stands is hidden within the overall BAP habitat figures (see above under Annex I H6410 concerning M26). Both M23 and M25, particularly the latter, also suffer the highest proportion of unfavourable litter layers after MG3. M23 can commonly have a heavy litter layer, especially if dominated by *Juncus effusus*, and so can M25, but this may not necessarily imply poor management; however, 27% and 37% respectively of recorded M23 and M25 stands were reported to be suffering a degree of under-management. About 25% of M25 stands are unfavourable for litter layer, of which about half are, not surprisingly, insufficiently diverse to pass the reduced positive indicator threshold. About half of the M25 stands with poor litter layers are also newly recorded, and in total 40% of M23 and M25 were newly recorded, i.e. not noted in the original surveys which highlighted more notable grassland features. The high favourability of Purple Moor-grass & Rush Pasture for bare ground (98%) would be 100% were it not for three M23 stands appearing to suffer from heavy poaching. The performance of Purple Moor-grass & Rush Pasture with regard to positive indicators (27% at SCM thresholds, 50% at reduced thresholds) is the poorest of the BAP habitats, and partly reflects the fact that some M23 was also 'newly recorded' on sites which had other more notable interest, where the M23 was frequently small in extent and of poor quality. The relatively poor positive indicator performance of M23 is also likely to reflect the very short positive indicator list currently used for M23; we are certainly aware of some stands with good plants not currently used as indicators (for further discussion on this see 'Discussion of M23 positive indicators' above).

## 4.7 Summary of management issues

Through analysis of negative management issues noted (or in some cases inferred) at the surveyed stands, Table 41, Table 42 and Table 43 were produced to show the broad types of management issue affecting different Annex I habitats, BAP Priority habitats and local authority areas. Negative management is divided into four broad types: agricultural intensification (which includes overgrazing, improvement or semi-improvement of grass swards, and very occasionally other factors such as drainage or complete ploughing); built development (which here mainly concerns house construction, but very occasionally also industrial development or road construction); plantation (of trees – both coniferous and broad-leaved); and finally under-management (insufficient grazing or cutting, which typically reveals itself through significant growth or encroachment of coarse grasses, bracken, trees/scrub, or occasionally ericoids). These are abbreviated to 'Agric.', 'Devel.', 'Plant.' and 'Underm.' in the following tables. Each table also has a final column which indicates the presence of any of the above negative management issues. The percentages in this last column are not necessarily the same as the sum of the others, because some stands exhibited more than one kind of poor management; indeed, some stands suffered opposite effects at the same time, such as both agricultural intensification and under-management in different parts of the same stand. A good example of this is a site in Dumfries & Galloway where U4 was both overgrazed in the parts which cattle most frequented, and also undergrazed in other parts which cattle infrequently visited and where gorse had apparently drastically expanded; still other parts of the stand appeared to be satisfactorily grazed.

Of immediate note is the fact that 46% of all surveyed stands exhibited some form of negative management. Although this figure, and the others in the tables below, incorporates occasional total loss of stands through negative management (10% of stands were lost completely), it is important to note that negative management did not impact the entirety of affected extant stands: in many cases only part of a stand was affected. Nevertheless, this is a fairly high proportion of stands suffering some degree of negative management.

For Annex I stands, the proportion suffering negative management is actually slightly higher, at 49%, than all stands taken together. However, this is largely accounted for by the frequent under-management of the surveyed MG3 (Annex I H6520) and consequent development of coarse grasses and scrub, as already discussed. Under-management is also the main negative impact on the other two Annex I habitats, where negative management occurs. As expected, the Annex I calcareous grasslands (6210 and H6230) exhibit the least negative management, and as already pointed out this results mainly from limited scrub encroachment, though rarely overgrazing and encroachment of coarse grasses have had an effect. Annex I H6410 (M26), if it is accepted that it exists at the stands assigned to it (see 'Recording of M26 in Scotland' in Appendix 3), has suffered a limited amount of undergrazing and limited encroachment of woody vegetation.

*Table 41. Percentage of Annex I stands affected by negative management*

| <b>Annex I habitat</b> | <b>Agric.</b> | <b>Devel.</b> | <b>Plant.</b> | <b>Underm.</b> | <b>Any negative management</b> |
|------------------------|---------------|---------------|---------------|----------------|--------------------------------|
| 6210                   | 4%            | 4%            | 0%            | 19%            | 23%                            |
| 6410                   | 0%            | 0%            | 0%            | 57%            | 57%                            |
| 6520                   | 11%           | 6%            | 0%            | 72%            | 83%                            |
| Total                  | 6%            | 4%            | 0%            | 43%            | 49%                            |

*Table 42. Percentage of BAP Priority stands affected by negative management*

| <b>BAP habitat</b> | <b>Agric.</b> | <b>Devel.</b> | <b>Plant.</b> | <b>Underm.</b> | <b>Any negative management</b> |
|--------------------|---------------|---------------|---------------|----------------|--------------------------------|
| LCG                | 6%            | 1%            | 1%            | 23%            | 27%                            |
| UHM                | 11%           | 6%            | 0%            | 72%            | 83%                            |
| LM                 | 33%           | 8%            | 3%            | 39%            | 68%                            |
| LDAG               | 13%           | 2%            | 4%            | 28%            | 39%                            |
| PMRP               | 8%            | 4%            | 4%            | 31%            | 43%                            |
| <b>Total</b>       | <b>15%</b>    | <b>4%</b>     | <b>3%</b>     | <b>32%</b>     | <b>46%</b>                     |

*Table 43. Percentage of all constituent NVC stands affected by negative management according to local authorities*

| <b>Local Authority</b> | <b>Agric.</b> | <b>Devel.</b> | <b>Plant.</b> | <b>Underm.</b> | <b>Any negative management</b> |
|------------------------|---------------|---------------|---------------|----------------|--------------------------------|
| Aberdeenshire          | 14%           | 0%            | 0%            | 64%            | 73%                            |
| Borders                | 1%            | 0%            | 1%            | 11%            | 12%                            |
| Dumfries & Galloway    | 14%           | 0%            | 7%            | 36%            | 54%                            |
| East Ayrshire          | 28%           | 0%            | 39%           | 39%            | 72%                            |
| Fife                   | 10%           | 2%            | 2%            | 33%            | 39%                            |
| Highland               | 27%           | 10%           | 0%            | 34%            | 60%                            |
| Inverclyde             | 11%           | 0%            | 0%            | 22%            | 33%                            |
| Moray                  | 10%           | 0%            | 5%            | 57%            | 71%                            |
| North Ayrshire         | 27%           | 0%            | 7%            | 47%            | 80%                            |
| Renfrewshire           | 29%           | 10%           | 3%            | 42%            | 65%                            |
| South Ayrshire         | 33%           | 13%           | 3%            | 40%            | 70%                            |
| Stirling               | 0%            | 0%            | 0%            | 43%            | 43%                            |
| West Lothian           | 0%            | 4%            | 8%            | 20%            | 28%                            |
| <b>Total</b>           | <b>15%</b>    | <b>4%</b>     | <b>3%</b>     | <b>32%</b>     | <b>46%</b>                     |

For BAP Priority habitats, under-management is again the most frequent problem, but here agricultural intensification is more significant too, especially for Lowland Meadow (MG5 except for one MG8 stand). As discussed above MG5 appears to have suffered some loss and degradation, being partly replaced by non-NVC species-poor grassland (see 'Species-poor grassland with no NVC equivalent' above); this is a result of agricultural intensification, appearing to have had a degree of effect on one third of surveyed MG5 stands. Plantation and development have had a smaller impact, the latter affecting more MG5 stands than any other constituent NVC community (mainly a result of several stands suffering partial loss to house construction on small crofting sites). Upland Hay Meadow (MG3) is equivalent to Annex I H6520 – refer to previous paragraph.

Lowland Calcareous Grassland has, like Annex I H6210 and H6230 which are subsumed within it, suffered the least poor management, and as for Annex I H6210 / H6230 the most frequent negative impact, at nearly one quarter of stands, is a degree of under-management (mostly causing scrub encroachment and sometimes coarse grass development); a few calcareous grasslands have also suffered from overgrazing and, on one site, poaching.

Nearly 40% of Lowland Acid Grassland stands were affected by some form of negative management, again most commonly under-management (resulting in unfavourable development of coarse grass, bracken and scrub, these occasionally causing total loss). Agricultural intensification is also significant for this BAP habitat (affecting U4), and there has also been some negative impact from development and plantation.

For Purple Moor-grass & Rush Pasture the negative management effects largely concern M23 and M25 which very greatly outnumber M26 stands. Here, the main problem is again under-management (insufficient grazing), though agricultural intensification has also occurred (including limited drainage), and there have been smaller impacts from development and plantation.

For consideration of negative management in different local authority areas, refer to the following section.

#### **4.8 Variability across local authorities**

There are few obvious trends across the local authorities. However, the following points can be made, though they may be biased by the sometimes small number of stands surveyed in a given local authority area, or occasionally by the localised distribution of surveyed stands within them (as in Aberdeenshire, where most of the sites were by the River Dee).

In the Borders a higher than average proportion of stands are in good condition, with associated high positive indicator counts, and other attributes generally good except for bare ground. The high regional favourability of positive indicators in the Borders is a reflection of the large number of sites in that area with good quality dry grasslands, especially calcareous communities, and also the frequency of diverse U4c in this region; the poorer bare ground attribute results largely from the U1 in this area. Fife fares similarly but not quite as well as the Borders, having some of the same calcareous grasslands but less of them and containing less diversity. Bare ground also fails targets in this region because of locally excessive bare ground in calcareous communities and U1. Borders has an especially low proportion of stands clearly affected by poor management, at only 12% (compared to 46% for all surveyed stands across Scotland as a whole).

North Ayrshire performs best of all for overall condition and positive indicators, but this is based on only 15 stands, several of which are rather small. Additionally, there appears to have been some counteracting loss (though not enormous) of Lowland Dry Acid Grassland and Purple Moor-grass & Rush Pasture in this area.

Renfrewshire and South Ayrshire have the lowest proportion of overall favourable stands (32% each), with associated poor assessments overall for positive indicators and (in Renfrewshire) negative indicators (from both overgrazing and under-management). This obscures the fact that one of the Renfrewshire sites had very high quality and extensive MG5 which has recently been assigned SSSI status. East Ayrshire also fares rather poorly, and these three regions have all suffered appreciable loss of habitat. Appreciable partial stand loss to development is apparent in Renfrewshire and South Ayrshire. Plantation has also affected these regions (one stand in each) as well as North Ayrshire (one stand) and, more severely, East Ayrshire (seven stands; 39%). All three Ayrshire regions and Renfrewshire also exhibit a higher than average percentage of stands affected by agricultural intensification (30%, rivalled only by Highland). Plantation also caused some significant loss in Dumfries & Galloway (two sites), and it seems that loss to plantation is predominantly a problem in south-west Scotland amongst the stands surveyed for this study.

Aberdeenshire also had a relatively low level of favourable stands, at 40%. The reason for this is different to the south-west regions: the main cause is poor negative indicator performance, which in turn is due mainly to under-management (or inappropriate management) on several of the River Dee sites, resulting in spread of coarse grasses and scrub. This is also the primary cause of the low pass rate for Annex I H6520/Upland Hay Meadow (MG3) throughout. Under-management has also resulted in the poor performance of Aberdeenshire for grass:forb ratio, vegetation height and litter layer. Since nearly all the

Aberdeenshire sites were beside the River Dee, however, low favourability in this region cannot be assumed to apply to the whole of it.

For the local authority areas of Dumfries & Galloway, Highland, Inverclyde, Moray, Stirling and West Lothian, attribute favourability is generally close to the average for all surveyed stands across Scotland taken as a whole. As noted above, however, there are some notable points concerning some of these regions. There appears to have been appreciable loss and degradation of Lowland Meadow (MG5), and some U4, in Highland, and in this region partial loss of stands to development of houses on small crofting areas was not uncommon (development was also a significant factor for Renfrewshire and South Ayrshire), and agricultural intensification affected a higher than average proportion of stands, at 27% (largely affecting MG5 and some U4). This loss in Highland is a significant part of the overall constituent NVC area loss across the surveyed sites (see above under 'BAP Priority losses'). Dumfries & Galloway, as mentioned above, exhibits an appreciable degree of loss to plantation (again making a significant contribution to overall area loss across all surveyed stands, but mainly due to impacts at one site), as does West Lothian (although only two stands are affected by plantation in each of these two regions). Negative indicator performance in Stirlingshire is rather poor and the main contributing factor on these sites appears to be under-management; this is also the main cause of unfavourably tall vegetation height in both the Stirlingshire and West Lothian stands.

#### 4.9 Summary information for each local authority area

This section provides a short summary of what was found in each local authority area. For each area the information given here is:

- The total area of constituent NVC community habitat, the total number of extant contributing stands, and the total number of extant contributing sites.
- A rough indication of the relative proportions of BAP Priority habitats and their constituent NVC communities, and indication of Annex I status if present.
- The percentage of stands (of all constituent NVC communities together) found to be in favourable condition (using reduced positive indicator thresholds); percentage of stands lost completely (these do not count towards favourability, which covers only extant stands); hectare and percentage loss of constituent NVC area (using second area analysis method described in the Results section, including estimated partial as well as total losses, and probably overestimated for reasons given above).
- Mention of any notable features found (e.g. notable species, uncommon NVC communities, etc).

##### 4.9.1 Aberdeenshire

- 20.4 ha of constituent NVC communities surveyed (20 extant stands at 10 sites).
- Mostly PMRP (M23 & M25) and LDAG (U4). Smaller extent of UHM ([Annex I H6520](#): MG3), and a very little LM (MG5) and LCG ([Annex I H6230](#): CG10).
- 40% of stands in overall favourable condition (60% unfavourable largely as a result of under-management at River Dee sites, where most of the surveyed stands were located); 0% of stands completely lost; constituent NVC area reduction 1.0ha (4.6%).
- Notable features: concentration of UHM ([Annex I H6520](#)) along River Dee (nationally uncommon MG3 community with *Geranium sylvaticum* and *Cirsium heterophyllum*, and several other species of note including *Galium boreale* and *Platanthera chlorantha*), including the most diverse examples found in this survey (although most are suffering unfavourable levels of coarse grasses); recorded presence of riverside northern variants of M27, U17 and MG9 with northern elements such as *Geranium*

*sylvaticum* and *Cirsium heterophyllum*); unusual northern observation of a few plants of *Dianthus deltoides*, also by River Dee (and also threatened by coarse grasses).

#### 4.9.2 Borders

- 251.5 ha of constituent NVC communities surveyed (121 extant stands at 43 sites).
- Mostly LDAG (U1 & U4). Smaller extents of PMRP (M23 and a very little M25), LCG (diverse, including the most Annex I H6210 of the surveyed local authority areas: mostly CG7 and CG10, a little CG2 and one CG1 stand; also numerous Annex I H6230: CG10 stands), & LM (MG5).
- 82% of stands in favourable condition; 1% of stands completely lost; constituent NVC area reduction 12ha (4.8%, mainly due to improvement on one U4 site).
- Notable features: good concentration (within area shown in map below) of botanically interesting grasslands with visually distinctive ridge topography. Main interest is LCG and LDAG; LCG includes southern communities CG1 (one stand), CG2 (several, both CG1 and CG2 very rare in Scotland) and CG7 (scarce in Scotland, and most diverse in this region), and is important for the uncommon *Dianthus deltoides* and also includes *Galium sternerii* and the southern *Scabiosa columbaria*, *Leontodon hispidus*, *Carlina vulgaris* and *Sanguisorba minor*; LDAG includes important concentration of good sites of the U4c sub-community; LM includes (rarely) *Agrimonia eupatoria*, *Sanguisorba officinalis*, *Plantago media* and *Galium boreale*; some PMRP includes *Valeriana dioica* in M23, though much M23 in this region was poor, the main interest being the short dry grasslands.

The area outlined in the map below encompasses the area in the Borders that contains fields with geological ridges roughly orientated south-west to north-east.

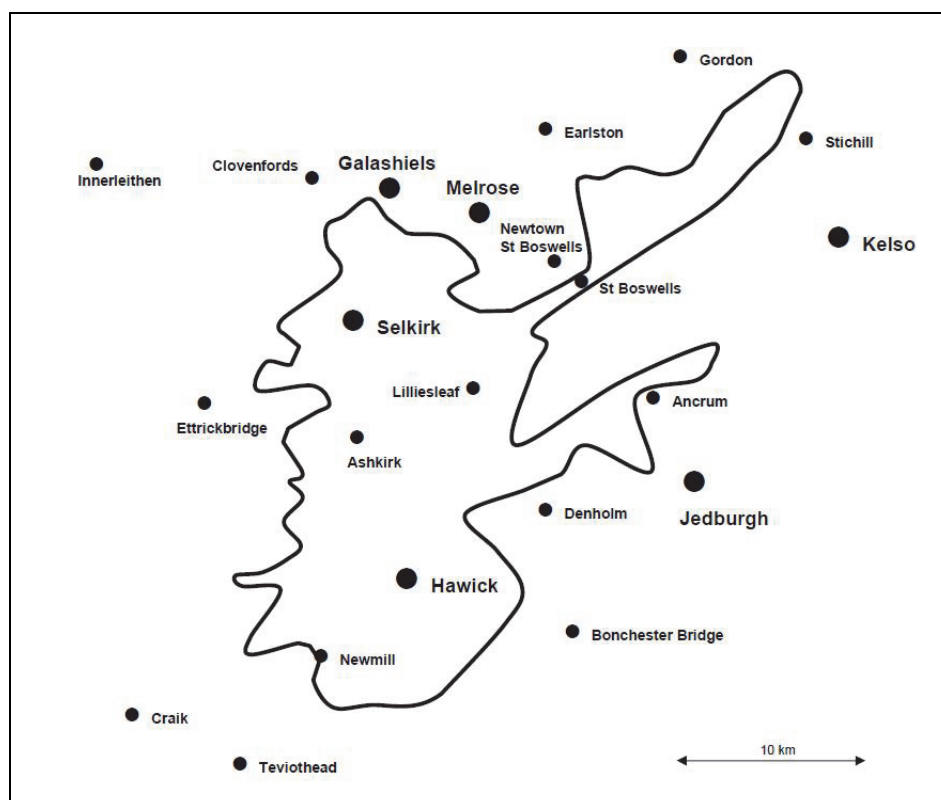


Figure 26. Map showing area containing fields with SW-NE-orientated ridges in the Borders

These fields are notable for their many good examples of Lowland Calcareous Grassland BAP Priority habitat (in this area represented by NVC communities CG2, CG7 and CG10), many of which include Annex I H6210 habitat (CG2 and CG7) and Annex I H6230 habitat (CG10), and Lowland Dry Acid Grassland BAP Priority habitat (NVC U1 and U4 including much U4c). These CG7 sites collectively form one of the UK hotspots for *Dianthus deltoides*. The area outlined on this map is based both on the vegetation surveys conducted in 2010-2011 for this study, and examination of freely-available online aerial photography to look for other fields with this type of ridge topography.

#### 4.9.3 Dumfries & Galloway

- 51.8 ha of constituent NVC communities surveyed (22 extant stands at 10 sites).
- Mostly LDAG (U4 and a little U1) and PMRP (M23 & M25). Smaller extents of LM (MG5) and UHM (Annex I H6520: MG3).
- 59% of extant stands in favourable condition; 21% of stands completely lost; constituent NVC area reduction 33ha (39%, mainly due to plantation on one M25 site).
- Notable features: species include *Carum verticillatum*, *Sanguisorba officinalis*, *Meum athamanticum*, *Gymnadenia conopsea*, *Trollius europaeus*, *Dactylorhiza purpurella* (these six mainly in PMRP, with M23 particularly diverse in this region); *Sanguisorba officinalis* (in LM: MG5); *Platanthera chlorantha*, *Botrychium lunaria* and (southern, and rare in Scotland) *Genista tinctoria* (all in LDAG: U4, with *P. chlorantha* also in LM: MG5); and *Jasione montana* in LDAG: U1. NVC communities include a tiny amount of the uncommon MG3 (Annex I H6520), with *Geranium sylvaticum*, although this is the poor type with much coarse grass.

#### 4.9.4 East Ayrshire

- 12.8 ha of constituent NVC communities surveyed (16 extant stands at seven sites).
- Mostly LM (MG5) and PMRP (M23 and a little M25). Also a very little LCG (Annex I H6230: CG10).
- 44% of extant stands in favourable condition; 11% of stands completely lost; constituent NVC area reduction 1.8ha (12%, including significant loss to plantation and agricultural intensification).
- Notable features: LDAG includes *Gymnadenia conopsea*, *Platanthera chlorantha* and *Viola lutea*; LM includes *Platanthera chlorantha* and *Meum athamanticum*.

#### 4.9.5 Fife

- 81.6 ha of constituent NVC communities surveyed (42 extant stands at 26 sites).
- Mostly LDAG (U4 and a little U1); smaller extents of PMRP (M23 & some M25), LCG (Annex I H6210 and H6230: CG7, some CG10 and a very little CG2), and LM (MG5).
- 69% of extant stands in favourable condition; 14% of stands completely lost; constituent NVC area reduction 5.1ha (5.9%, largely through under-management).
- Notable features: includes several sites for CG7 which is southern and scarce in Scotland, and is here almost at its northern British limit. LCG includes in the CG7 several populations of the uncommon *Dianthus deltoides* (where under-management and coarse grass encroachment is an issue), and *Filipendula vulgaris* at a coastal site (a southern species, very rare in Scotland); LCG also includes small coastal CG2 stand (note – another previous record of CG2 in Fife appeared to be an error for maritime communities); LM (MG5) includes *Agrimonia eupatoria*.

#### 4.9.6 Highland (Skye & Lochaber)

- 69.5 ha of constituent NVC communities surveyed (91 extant stands at 55 sites).
- Mostly LM (MG5) and PMRP (M23, M25 and a little [Annex I H6410: M26](#)). Smaller extents of LDAG (U4) and UHM ([Annex I H6520: MG3](#)), and a very little LCG ([Annex I H6230: CG10](#)).
- 59% of extant stands in favourable condition; 24% of stands completely lost; constituent NVC area reduction 27ha (28%, frequently due to loss of MG5 to agricultural intensification, with also limited loss to development of houses on small crofts).
- Notable features: communities include the uncommon MG3 ([Annex I H6520](#)) and M26 ([Annex I H6410](#)), although see M26 in Appendix 3 regarding interpretation of M26. Species in LM and PMRP include *Platanthera chlorantha*, *P. bifolia*, *Dactylorhiza purpurella*, *D. incarnata*, *Gymnadenia conopsea*, *Carum verticillatum*, *Trollius europaeus*, *Cirsium heterophyllum*, *Daucus carota*, *Lythrum salicaria*, *Schoenus nigricans* and *Salix pentandra*; species in LCG include *Galium boreale*, *Antennaria dioica* and *Gentianella campestris*; species in UHM include *Geranium sylvaticum*, *Cirsium heterophyllum* and *Trollius europaeus*.

#### 4.9.7 Inverclyde

- 24.4 ha of constituent NVC communities surveyed (nine extant stands at four sites).
- Mostly LDAG (U4). Slightly smaller extent of PMRP (M23 & some M25).
- 67% of extant stands in favourable condition; 0% of stands completely lost; constituent NVC area reduction <0.1ha (0.1%).
- Notable features: limited as only four sites were surveyed here, but these include botanically interesting LDAG and PMRP with *Viola lutea* and *Carum verticillatum* respectively.

#### 4.9.8 Moray

- 15.5 ha of constituent NVC communities surveyed (17 extant stands at 10 sites).
- Mostly LDAG (U4) and LM (MG5 and, at one site, MG8). Smaller extent of PMRP (M23), and a very little LCG ([Annex I H6230: CG10](#)) and UHM ([Annex I H6520: MG3](#)).
- 65% of extant stands in favourable condition; 15% of stands completely lost; constituent NVC area reduction 13.6ha (47%, mainly due to two undermanaged sites).
- Notable features: includes the only record of the uncommon MG8 community in this survey (although it is in unfavourable condition); also some MG3 ([Annex I H6520](#), uncommon in Britain) with good populations of *Geranium sylvaticum* and *Cirsium heterophyllum*.

#### 4.9.9 North Ayrshire

- 15.4 ha of constituent NVC communities surveyed (15 extant stands at seven sites).
- Mostly PMRP (M23 & M25). Smaller extent of LDAG (U4), and a very little LCG (CG10, but none constituting Annex I habitat).

- 80% of extant stands in favourable condition; 0% of stands completely lost; constituent NVC area reduction 2ha (12%, including appreciable partial loss to agricultural intensification).
- Notable features: there is no mention in the site descriptions of any particularly notable species in the constituent NVC communities, but at some sites other adjacent wetland vegetation has species of interest including *Anagallis tenella*, *Sagina nodosa*, *Schoenus nigricans*, *Baldellia ranunculoides* and *Lythrum salicaria*.

#### 4.9.10 Renfrewshire

- 57.5 ha of constituent NVC communities surveyed (31 extant stands at 16 sites).
- Mostly LDAG (U4). Smaller extents of PMRP (M23 and a little M25) and LM (MG5).
- 32% of extant stands in favourable condition; 0% of stands completely lost; constituent NVC area reduction 5.9ha (9%, including appreciable partial loss to development and agricultural intensification).
- Notable features: *Carum verticillatum* in PMRP; *Platanthera chlorantha* in LDAG and LM, and *Meum athamanticum* in LDAG; one LM (MG5) site has since been assigned SSSI status, the diversity here strongly contributing to the high overall diversity of sampled MG5 in this region; there is some interest in associated non-constituent NVC communities including *Platanthera bifolia*, *Carex aquatilis*, *C. paniculata* and *Salix pentandra*.

#### 4.9.11 South Ayrshire

- 8.7 ha of constituent NVC communities surveyed (25 extant stands at 12 sites).
- Mostly PMRP (M23 and a little M25). Smaller extent of LDAG (U4), and a very little LM (MG5) and LCG (CG10, but none constituting Annex I habitat).
- 32% of extant stands in favourable condition; 17% of stands completely lost; constituent NVC area reduction 4.0ha (32%, including appreciable partial loss to development and agricultural intensification).
- Notable features: species in PMRP include *Eupatorium cannabinum* (in M25c), and *Carum verticillatum* and *Parnassia palustris* (in M23); *C. verticillatum* also in LM (MG5), though MG5 was frequently poor in this region; *Carex acutiformis* noted at one site.

#### 4.9.12 Stirling

- 56.2 ha of constituent NVC communities surveyed (40 extant stands at 14 sites).
- Mostly PMRP (M23 & M25). Smaller extents of LDAG (U4 and a little U1) and LM (MG5), and a very little UHM (Annex I H6520: MG3) and LCG (CG10, but none constituting Annex I habitat).
- 55% of extant stands in favourable condition (45% are unfavourable largely because of under-management); 0% of stands completely lost; constituent NVC area reduction 0.2ha (0.4%).
- Notable features: PMRP includes *Lysimachia thyrsiflora*, *L. vulgaris* and *Dactylorhiza purpurella*; NVC communities include a few small examples of the uncommon MG3 (Annex I H6520), with species including *Geranium sylvaticum* and *Platanthera chlorantha*, although these are either in unfavourable condition or becoming so.

#### 4.9.13 West Lothian

- 11.6 ha of constituent NVC communities surveyed (22 extant stands at 13 sites).
- Mostly LDAG (U4 and a little U1). Smaller extents of LM (MG5) and PMRP (M23), and an extremely small patch of LCG (Annex I H6210: CG2).
- 59% of extant stands in favourable condition (41% are unfavourable largely because of under-management); 12% of stands completely lost; constituent NVC area reduction 1.5ha (12%).
- Notable features: the CG2 is an uncommon southern NVC type, rare in Scotland, although the area concerned here is extremely small, comprising a few tiny old quarry spoil heaps; LM and PMRP include *Platanthera chlorantha*, *Listera ovata*, *Dactylorhiza purpurella* and *Agrimonia eupatoria*; LDAG includes *Viola lutea* and *P. chlorantha*.

#### 4.10 Comparison with BAP grassland condition data from England

Hewins et al (2005) undertook an assessment of the condition of non-designated sites in England in 2002-03. A sample of 500 non-statutory lowland grassland sites was selected at random from English Nature's Grassland Inventory, a register of high quality grassland sites over 0.5 ha in size. The sample was stratified firstly on the basis of BAP Priority grassland habitat and secondly to include approximately equal numbers within and outside agri-environment agreements.

Hewins's survey found that 24% of sites no longer corresponded to BAP habitats because of agricultural improvement or lack of management. This compares with the 16% of BAP habitat lost in Scotland between 1983 and 2011. Only 14% of sites in England were in favourable condition according to SSSI-standard SCM thresholds, compared with 41% in Scotland. 21% were in favourable condition by reduced non-statutory thresholds, compared to 58% in Scotland.

Table 44 breaks down these figures for individual BAP habitats. It compares the percentage of stands found in favourable condition in Scotland in 2010-11 with that in England 8 years earlier. In both countries, the figures are from stands found still to be BAP habitat.

*Table 44. Percentage of BAP grassland sample stands in favourable condition according to SSSI thresholds.*

| <b>BAP Habitat</b>                        | <b>Scotland 2010-11</b>   |                        | <b>England 2002-03</b>    |                        |
|-------------------------------------------|---------------------------|------------------------|---------------------------|------------------------|
|                                           | <b>Reduced thresholds</b> | <b>SSSI thresholds</b> | <b>Reduced thresholds</b> | <b>SSSI thresholds</b> |
| Lowland Meadows (LM)                      | 49                        | 35                     | 23                        | 8                      |
| Upland Hay Meadows (UHM)                  | 25                        | 19                     | 12                        | 2                      |
| Lowland Dry Acid Grassland (LDAG)         | 66                        | 47                     | 17                        | 16                     |
| Lowland Calcareous Grassland (LCG)        | 85                        | 75                     | 32                        | 22                     |
| Purple Moor-grass and Rush Pasture (PMRP) | 48                        | 25                     | 39                        | 24                     |

A greater proportion of all almost types of BAP Priority grassland was in favourable condition in Scotland in 2011 than in England in 2003. The exception is Purple Moor-grass and Rush

Pasture; the condition of this habitat, when assessed by SSSI thresholds, was virtually the same in both countries. However, given the differences between soil types, climate and past land management histories in Scotland and England, it is difficult to draw conclusions from these comparisons.

A lack of positive indicators was the main cause of unfavourable condition in England and is also one of the main causes in Scotland. The probable reason for this is low level eutrophication, both from applications of lime and fertilisers and from the effects of atmospheric nitrogen deposition. Negative indicators are also identified as one of the main causes of unfavourable condition in both countries. These can indicate under-management on the one hand, which allows false oat-grass to dominate and bracken and scrub to spread, and intensive management on the other hand, which can lead to poaching and soil compaction, creating conditions that encourage infestations of agricultural weeds.

The English study found that grasslands in agri-environment agreements were twice as likely to be in favourable condition as those outside agreements. Further work is needed in Scotland to investigate any relationship between grassland condition and current or past management under agri-environment schemes.

#### **4.11 Comparison with the condition of designated lowland grassland features**

SNH published the results of the first cycle of Site Condition Monitoring of designated features on SSSIs in 2010. Of the 129 lowland grassland features assessed in Cycle 1, which ran from 1999 to 2005, 52.7% were found to be in favourable condition. This compares with the statistic of 41% of non-designated stands in overall favourable condition in 2010-11 reported here (see 4.6.1), suggesting that management measures directed at SSSIs are successful in raising the condition of the habitat overall by around 12%.

#### **4.12 Recommendations for future surveys**

- I. Increase the number of positive indicator species available for site condition monitoring, particularly for M23. Consider combining some of the current indicator lists (e.g. M23, M25 and M26; U4 and MG5, possibly also with CG10 and MG3 indicators). This is because a stand may contain positive indicators currently employed for NVC communities other than the one in question, yet such indicators where at least occasional can still impute favourability, such as *Crepis paludosa*, *Trollius europaea* or *Parnassia palustris* in M23.
- II. Seriously consider the use of hand-held field computers (such as those made by 'Trimble'), for filling in site condition monitoring forms if nothing else. Whilst this would indubitably cause a limited degree of delay in the field, the compensation for data analysis would be substantial, and filling in tick boxes and number fields on a paper form is not greatly faster than doing the same on a hand-held computer. Writing of site descriptions should still however be done by hand and typed up later unless the user of the hand-held computer is proficient in using the techniques for writing with a stylus on the screen. Such hand-held computers can be used to digitise mapping in the field as well, although this necessitates a great deal of initial organisation getting the digital maps ready, obtaining appropriate software and teaching both surveyors to use it and managers to use the data (who preferably need to be technically-minded).
- III. Include questions on SCM forms similar to those used for this project: e.g. is the community still present, lost or an error? If lost how did this happen? Is there poor management? If there has been total or partial loss what is the replacement? Is the community *likely* to have decreased in extent or stayed much the same, and if

decreased roughly by how much? This last question in particular should always be asked whether the community has been re-found or is newly recorded, and especially if the original surveys are rough. Such information is extremely useful during analysis, as long as the answers are, as far as possible, limited to lists of set options; the alternative reading of written statements with subsequent extraction and analysis of relevant information is very time-consuming, and may not give exactly what is wanted in the way required.

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## APPENDIX 1. UNCORRECTED AREA ANALYSIS

The figures obtained from the initial uncorrected area analysis described in section 3.2.2 are shown below. These are considered to be less accurate than the figures obtained from the corrected area analysis described in section 3.2.3.

*Table 45. Uncorrected analysis: apparent difference in area (ha) of Annex I habitats between original and new surveys, according to local authorities, and excluding those communities considered to have been recorded erroneously in the original survey or Lowland Grassland Database.*

| Local Authority     | 6210  | 6230  | 6410 | 6520  | Total |
|---------------------|-------|-------|------|-------|-------|
| Aberdeenshire       |       | -3.74 |      | -1.88 | -5.62 |
| Borders             | -2.71 | 7.89  |      |       | 5.18  |
| Dumfries & Galloway |       |       |      | 0.06  | 0.06  |
| East Ayrshire       |       | -0.19 |      |       | -0.19 |
| Fife                | 2.14  |       |      |       | 2.14  |
| Highland            | -0.78 | 0.46  | 1.59 | 0.89  | 2.16  |
| Moray               |       | -1.73 |      | 0.13  | -1.59 |
| Stirling            |       |       |      | -2.32 | -2.32 |
| West Lothian        | 0.01  |       |      |       | 0.01  |
| Total               | -1.34 | 2.69  | 1.59 | -3.11 | -0.17 |

*Table 46. Uncorrected analysis: apparent difference in area (ha) of BAP Priority habitats between original and new surveys, according to local authorities, and excluding those communities considered to have been recorded erroneously in the original survey or Lowland Grassland Database.*

| Local Authority     | LCG   | UHM   | LM      | LDAG   | PMRP   | Total   |
|---------------------|-------|-------|---------|--------|--------|---------|
| Aberdeenshire       | -3.74 | -1.88 | -0.44   | 0.20   | 1.06   | -4.79   |
| Borders             | 5.18  |       | -4.82   | -28.06 | 6.88   | -20.82  |
| Dumfries & Galloway |       | 0.06  | -20.24  | -23.86 | -12.55 | -56.59  |
| East Ayrshire       | -0.19 |       | -2.36   | 0.60   | 1.05   | -0.90   |
| Fife                | 1.45  |       | -0.88   | -6.01  | 6.09   | 0.64    |
| Highland            | -0.32 | 0.89  | -56.25  | 7.48   | -7.62  | -55.82  |
| Inverclyde          |       |       |         | 10.48  | 3.06   | 13.54   |
| Moray               | -1.73 | 0.14  | -0.08   | -23.31 | 2.13   | -22.85  |
| North Ayrshire      | -0.12 |       |         | -2.14  | -4.57  | -6.83   |
| Renfrewshire        |       |       | -14.85  | 22.88  | 10.72  | 18.75   |
| South Ayrshire      | -1.39 |       | -7.43   | 1.54   | -8.30  | -15.58  |
| Stirling            | -0.08 | -2.32 | -2.68   | -10.82 | 3.74   | -12.17  |
| West Lothian        | 0.01  |       | -0.98   | -3.93  | 1.29   | -3.60   |
| Total               | -0.92 | -3.11 | -111.02 | -54.95 | 2.98   | -167.02 |

Table 47. Uncorrected analysis: apparent percentage (%) difference in area of Annex I habitats between original and new surveys (expressed as percentage of originally mapped extent), according to local authorities, and excluding those communities considered to have been recorded erroneously in the original survey or Lowland Grassland Database. Infinity symbols indicate that all habitat is newly recorded and the % increase apparently infinite.

| Local Authority     | 6210   | 6230   | 6410  | 6520   | Total  |
|---------------------|--------|--------|-------|--------|--------|
| Aberdeenshire       |        | -95.90 |       | -56.82 | -77.99 |
| Borders             | -22.29 | 70.79  |       |        | 22.25  |
| Dumfries & Galloway |        |        | ∞     | ∞      |        |
| East Ayrshire       |        | -96.15 |       |        | -96.15 |
| Fife                | 267.43 |        |       |        | 267.43 |
| Highland            | -97.10 | ∞      | 83.69 | 68.11  | 53.96  |
| Moray               |        | -86.35 |       | ∞      | -79.60 |
| Stirling            |        |        |       | -77.40 | -77.40 |
| West Lothian        | ∞      |        |       |        | ∞      |
| Total               | -9.72  | 15.60  | 83.69 | -40.97 | -0.42  |

Table 48. Uncorrected analysis: apparent percentage (%) difference in area of BAP Priority habitats between original and new surveys (expressed as percentage of originally mapped extent), according to local authorities, and excluding those communities considered to have been recorded erroneously in the original survey or Lowland Grassland Database. Infinity symbols indicate that all habitat is newly recorded and the % increase apparently infinite.

| Local Authority     | LCG    | UHM    | LM     | LDAG   | PMRP    | Total  |
|---------------------|--------|--------|--------|--------|---------|--------|
| Aberdeenshire       | -95.90 | -56.82 | -49.27 | 2.37   | 12.48   | -19.03 |
| Borders             | 22.25  |        | -21.55 | -14.85 | 18.22   | -7.64  |
| Dumfries & Galloway |        | ∞      | -83.30 | -48.59 | -35.87  | -52.20 |
| East Ayrshire       | -96.15 |        | -31.93 | 20.84  | 32.86   | -6.56  |
| Fife                | 96.40  |        | -27.62 | -7.90  | 2029.16 | 0.78   |
| Highland            | -39.63 | 68.11  | -65.29 | 111.67 | -22.82  | -43.49 |
| Inverclyde          |        |        |        | 268.63 | 43.74   | 124.20 |
| Moray               | -86.35 | ∞      | -1.26  | -77.44 | ∞       | -59.59 |
| North Ayrshire      | -58.16 |        |        | -37.61 | -28.01  | -30.75 |
| Renfrewshire        |        |        | -75.77 | 219.98 | 122.57  | 48.39  |
| South Ayrshire      | -99.15 |        | -90.61 | ∞      | -56.47  | -64.11 |
| Stirling            | -79.82 | -77.40 | -67.05 | -69.22 | 8.19    | -17.81 |
| West Lothian        | ∞      |        | -30.48 | -34.44 | 215.30  | -23.69 |
| Total               | -2.77  | -40.97 | -59.82 | -13.42 | 1.41    | -19.71 |

*Table 49. Uncorrected analysis: apparent estimated rate of change (ha/yr) of Annex I habitats, according to local authorities, and excluding those communities considered to have been recorded erroneously in the original survey or Lowland Grassland Database.*

| <b>Local Authority</b> | <b>6210</b>  | <b>6230</b> | <b>6410</b> | <b>6520</b>  | <b>Total</b> |
|------------------------|--------------|-------------|-------------|--------------|--------------|
| Aberdeenshire          |              | -0.17       |             | -0.08        | -0.25        |
| Borders                | -0.18        | 0.41        |             |              | 0.23         |
| Dumfries & Galloway    |              |             |             | 0.00         | 0.00         |
| East Ayrshire          |              | -0.01       |             |              | -0.01        |
| Fife                   | 0.10         |             |             |              | 0.10         |
| Highland               | -0.05        | 0.02        | 0.08        | 0.05         | 0.10         |
| Moray                  |              | -0.09       |             | 0.01         | -0.08        |
| Stirling               |              |             |             | -0.12        | -0.12        |
| West Lothian           | 0.00         |             |             |              | 0.00         |
| <b>Total</b>           | <b>-0.13</b> | <b>0.16</b> | <b>0.08</b> | <b>-0.14</b> | <b>-0.03</b> |

*Table 50. Uncorrected analysis: apparent estimated rate of change (ha/yr) of BAP Priority habitats, according to local authorities, and excluding those communities considered to have been recorded erroneously in the original survey or Lowland Grassland Database.*

| <b>Local Authority</b> | <b>LCG</b>    | <b>UHM</b>    | <b>LM</b>     | <b>LDAG</b>   | <b>PMRP</b>  | <b>Total</b>  |
|------------------------|---------------|---------------|---------------|---------------|--------------|---------------|
| Aberdeenshire          | -0.174        | -0.080        | -0.017        | -0.050        | 0.050        | -0.271        |
| Borders                | 0.227         |               | -0.405        | -1.160        | 0.432        | -0.906        |
| Dumfries & Galloway    |               | 0.003         | -0.880        | -1.037        | -0.546       | -2.460        |
| East Ayrshire          | -0.007        |               | -0.084        | 0.022         | 0.039        | -0.030        |
| Fife                   | 0.064         |               | -0.037        | -0.247        | 0.288        | 0.068         |
| Highland               | -0.026        | 0.046         | -3.062        | 0.274         | -0.319       | -3.087        |
| Inverclyde             |               |               |               | 0.655         | 0.186        | 0.840         |
| Moray                  | -0.086        | 0.007         | -0.048        | -1.198        | 0.126        | -1.200        |
| North Ayrshire         | -0.004        |               |               | -0.077        | -0.163       | -0.244        |
| Renfrewshire           |               |               | -0.921        | 1.402         | 0.657        | 1.138         |
| South Ayrshire         | -0.050        |               | -0.268        | 0.055         | -0.297       | -0.559        |
| Stirling               | -0.004        | -0.118        | -0.141        | -0.552        | 0.190        | -0.624        |
| West Lothian           | 0.001         |               | -0.064        | -0.254        | 0.086        | -0.231        |
| <b>Total</b>           | <b>-0.059</b> | <b>-0.142</b> | <b>-5.927</b> | <b>-2.166</b> | <b>0.728</b> | <b>-7.566</b> |

## APPENDIX 2. AREA AND ATTRIBUTE TABLES FOR SEPARATE CONSTITUENT NVC COMMUNITIES

Table 51. Area (ha) of NVC communities on surveyed sites, with breakdown by BAP Priority habitats and Annex I habitats, according to local authorities. † = in SNH Lowland Grassland Database (from original surveys or interpretations of them) but regarded as erroneous.

| Local Authority     | LCG    |        |                       |         | UHM           | LM      |               | LDAG   |          | PMRP          |     |          |         | Total    |         |
|---------------------|--------|--------|-----------------------|---------|---------------|---------|---------------|--------|----------|---------------|-----|----------|---------|----------|---------|
|                     | 6210   |        | partly H6210/<br>6230 | 6520    | (not Annex I) |         | (not Annex I) |        | 6410     | (not Annex I) |     |          |         |          |         |
|                     | CG1    | CG2    |                       | CG7     | CG10          | MG3     | MG5           | MG8    | U1       | U4            | M26 | M22      | M23     |          | M25     |
| Aberdeenshire       |        |        |                       | 0.1598  | 1.4249        | 0.4565  |               |        | 8.8037   |               |     |          | 9.1954  | 0.3651   | 20.4055 |
| Borders             | 0.9492 | 5.4134 | 3.0764                | 19.0347 | †             | 17.5522 |               | 5.6688 | 155.2177 | †             | †   | 44.5636  | 0.0752  | 251.5512 |         |
| Dumfries & Galloway |        |        |                       |         | 0.0632        | 4.0575  |               | 0.0734 | 25.1711  |               |     | 21.6137  | 0.8330  | 51.8119  |         |
| East Ayrshire       |        |        |                       | 0.0077  |               | 5.0375  |               |        | 3.5044   |               |     | 4.1822   | 0.0692  | 12.8010  |         |
| Fife                |        | 0.1861 | 2.0661                | 0.6938  | †             | 2.1243  | †             | 1.6593 | 68.4770  |               |     | 5.9603   | 0.4271  | 81.5941  |         |
| Highland            |        |        |                       | 0.4829  | 2.1854        | 27.1003 |               |        | 14.1817  | 3.4901        |     | 12.6609  | 9.4284  | 69.5297  |         |
| Inverclyde          |        |        |                       |         |               |         |               |        | 14.3766  |               |     | 7.5042   | 2.5574  | 24.4381  |         |
| Moray               |        |        |                       | 0.2730  | 0.1350        | 2.6042  | 3.5674        |        | 6.7903   |               |     | 2.1291   |         | 15.4990  |         |
| North Ayrshire      |        |        |                       | 0.0837  |               | †       |               |        | 3.5561   |               |     | 7.4141   | 4.3206  | 15.3745  |         |
| Renfrewshire        |        |        |                       |         | †             | 4.7497  |               |        | 33.2776  |               |     | 17.9480  | 1.5268  | 57.5021  |         |
| South Ayrshire      |        |        |                       | 0.0118  |               | 0.7704  |               |        | 1.5410   |               |     | 5.4039   | 0.9952  | 8.7223   |         |
| Stirling            |        |        |                       | 0.0202  | 0.6780        | 1.3179  | †             | 0.0163 | 4.7950   | †             |     | 33.0281  | 16.3073 | 56.1628  |         |
| West Lothian        |        | 0.0090 |                       |         |               | 2.2247  |               | 0.0005 | 7.4736   |               |     | 1.8918   |         | 11.5996  |         |
| Total               | 0.9492 | 5.6085 | 5.1425                | 20.7676 | 4.4864        | 67.9951 | 3.5674        | 7.4183 | 347.1660 | 3.4901        | †   | 173.4953 | 36.9053 | 676.9917 |         |

Table 52. SCM positive indicators attribute (lost [L], unfavourable [U], or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authorities

| Local Authority     | LCG  |  |     |    |     |                   |    |   |     |   | UHM  |     |    | LM     |    |   | LDAG   |   |    |     |    | PMRP   |     |   |    |     |   | Total |      |     |  |
|---------------------|------|--|-----|----|-----|-------------------|----|---|-----|---|------|-----|----|--------|----|---|--------|---|----|-----|----|--------|-----|---|----|-----|---|-------|------|-----|--|
|                     | 6210 |  |     |    |     | partly H6210/6230 |    |   |     |   | 6520 |     |    | (none) |    |   | (none) |   |    |     |    | (none) |     |   |    |     |   |       | 6410 |     |  |
|                     | CG1  |  | CG2 |    | CG7 | CG10              |    |   | MG3 |   |      | MG5 |    | MG8    | U1 |   | U4     |   |    | M23 |    |        | M25 |   |    | M26 |   |       |      |     |  |
|                     | F    |  | F   |    |     | F                 | U  | L | F   | U | L    | F   | U  |        | L  | U | F      | U | L  | F   | U  | L      | F   | U | L  | F   | U |       | L    |     |  |
| Aberdeenshire       |      |  |     |    |     | 1                 | 1  |   |     | 1 | 6    |     | 1  | 3      |    |   |        | 4 |    |     | 2  |        | 1   |   |    |     |   | 20    |      |     |  |
| Borders             | 1    |  | 2   | 13 |     | 19                | 2  |   |     |   |      |     | 6  | 5      | 1  |   | 15     | 2 | 29 | 4   |    | 4      | 17  |   | 1  | 1   |   | 122   |      |     |  |
| Dumfries & Galloway |      |  |     |    |     |                   |    |   |     | 1 |      |     | 2  | 1      | 2  |   |        | 1 | 2  | 5   | 1  | 5      | 2   | 2 | 2  | 1   | 1 | 28    |      |     |  |
| East Ayrshire       |      |  |     |    |     |                   | 1  |   |     |   |      |     | 2  | 3      |    |   |        |   | 2  | 3   |    |        | 4   |   |    | 1   | 2 | 18    |      |     |  |
| Fife                |      |  | 1   | 4  | 3   | 1                 | 2  |   | 1   |   |      |     | 1  | 3      | 3  |   | 4      | 2 | 4  | 10  | 2  | 1      | 5   |   |    | 2   |   | 49    |      |     |  |
| Highland            |      |  |     |    |     | 8                 | 1  |   |     | 2 | 2    | 1   | 14 | 15     | 14 |   |        |   | 8  | 5   | 7  |        | 21  | 4 | 2  | 7   | 2 | 5     | 1    | 119 |  |
| Inverclyde          |      |  |     |    |     |                   |    |   |     |   |      |     |    |        |    |   |        |   | 3  |     |    | 4      |     | 1 | 1  |     |   | 9     |      |     |  |
| Moray               |      |  |     |    |     | 1                 | 2  |   |     |   | 1    |     | 2  | 1      | 1  |   | 1      |   | 4  | 1   | 2  |        | 4   |   |    |     |   | 20    |      |     |  |
| North Ayrshire      |      |  |     |    |     | 1                 |    |   |     |   |      |     |    |        |    |   |        |   | 3  | 1   |    | 4      | 3   |   | 2  | 1   |   | 15    |      |     |  |
| Renfrewshire        |      |  |     |    |     |                   |    |   |     |   |      |     | 4  | 1      |    |   |        |   | 1  | 10  |    | 3      | 11  |   |    | 1   |   | 31    |      |     |  |
| South Ayrshire      |      |  |     |    |     | 2                 |    | 1 |     |   |      |     | 2  | 4      | 4  |   |        |   | 2  | 3   |    |        | 8   |   | 1  | 3   |   | 30    |      |     |  |
| Stirling            |      |  |     |    |     | 2                 |    |   |     | 1 | 2    |     | 1  | 4      |    |   | 1      | 1 | 2  | 6   |    | 3      | 8   |   | 6  | 3   |   | 40    |      |     |  |
| West Lothian        |      |  | 1   |    |     |                   |    |   |     |   |      |     | 4  | 4      |    |   | 1      |   | 2  | 5   | 3  | 1      | 4   |   |    |     |   | 25    |      |     |  |
| Total               | 1    |  | 4   | 17 | 3   | 1                 | 36 | 7 | 2   | 4 | 12   | 1   | 39 | 44     | 25 | 1 | 21     | 6 | 63 | 56  | 15 | 21     | 93  | 6 | 16 | 21  | 5 | 5     | 1    | 526 |  |

Table 53. Overall condition at reduced positive indicator thresholds (lost [L], unfavourable [U] or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authorities

| Local Authority     | LCG  |   |     |     |   |                   |   |   |     |    | UHM  |     |    | LM     |     |    | LDAG   |    |    |    |     | PMRP   |    |     |    |   |   | 6410<br>M26 | Total |
|---------------------|------|---|-----|-----|---|-------------------|---|---|-----|----|------|-----|----|--------|-----|----|--------|----|----|----|-----|--------|----|-----|----|---|---|-------------|-------|
|                     | 6210 |   |     |     |   | partly H6210/6230 |   |   |     |    | 6520 |     |    | (none) |     |    | (none) |    |    |    |     | (none) |    |     |    |   |   |             |       |
|                     | CG1  |   | CG2 | CG7 |   | CG10              |   |   | MG3 |    |      | MG5 |    |        | MG8 | U1 |        | U4 |    |    | M23 |        |    | M25 |    |   |   |             |       |
|                     | U    | F | F   | U   | L | F                 | U | L | F   | U  | L    | F   | U  | L      | U   | F  | U      | F  | U  | L  | F   | U      | L  | F   | U  | L |   |             |       |
| Aberdeenshire       |      |   |     |     |   | 1                 | 1 |   | 1   | 6  |      | 4   |    |        |     |    |        | 4  |    |    | 1   | 1      |    | 1   |    |   |   | 20          |       |
| Borders             | 1    | 2 | 12  | 1   |   | 17                | 4 |   |     |    |      |     | 7  | 4      | 1   |    | 14     | 3  | 22 | 11 |     | 7      | 14 |     | 1  | 1 |   | 122         |       |
| Dumfries & Galloway |      |   |     |     |   |                   |   |   |     | 1  |      | 3   |    | 2      |     |    | 1      | 3  | 4  | 1  | 5   | 2      | 2  | 2   | 1  | 1 |   | 28          |       |
| East Ayrshire       |      |   |     |     |   | 1                 |   |   |     |    |      | 2   | 3  |        |     |    |        | 3  | 2  |    |     | 4      |    | 1   |    | 2 |   | 18          |       |
| Fife                |      | 1 | 4   | 3   | 1 | 2                 |   | 1 |     |    |      |     | 4  | 3      |     | 5  | 1      | 14 |    | 2  | 3   | 3      |    |     | 2  |   |   | 49          |       |
| Highland            |      |   |     |     |   | 9                 |   |   | 2   | 2  | 1    | 17  | 12 | 14     |     |    |        | 9  | 4  | 7  | 6   | 15     | 4  | 5   | 4  | 2 | 6 | 119         |       |
| Inverclyde          |      |   |     |     |   |                   |   |   |     |    |      |     |    |        |     |    |        | 2  | 1  |    | 3   | 1      |    | 1   | 1  |   |   | 9           |       |
| Moray               |      |   |     |     |   | 3                 |   |   |     | 1  |      | 2   | 1  | 1      | 1   |    |        | 4  | 1  | 2  | 2   | 2      |    |     |    |   |   | 20          |       |
| North Ayrshire      |      |   |     |     |   | 1                 |   |   |     |    |      |     |    |        |     |    |        | 3  | 1  |    | 6   | 1      |    | 2   | 1  |   |   | 15          |       |
| Renfrewshire        |      |   |     |     |   |                   |   |   |     |    |      |     | 2  | 3      |     |    |        | 3  | 8  |    | 5   | 9      |    |     | 1  |   |   | 31          |       |
| South Ayrshire      |      |   |     |     |   | 2                 |   | 1 |     |    |      |     | 1  | 5      | 4   |    |        | 2  | 3  |    | 2   | 6      |    | 1   | 3  |   |   | 30          |       |
| Stirling            |      |   |     |     |   | 2                 |   |   | 1   | 2  |      | 1   | 4  |        |     | 1  | 1      | 3  | 5  |    | 7   | 4      |    | 7   | 2  |   |   | 40          |       |
| West Lothian        |      | 1 |     |     |   |                   |   |   |     |    |      |     | 6  | 2      |     |    | 1      |    | 4  | 3  | 3   | 1      | 4  |     |    |   |   | 25          |       |
| Total               | 1    | 4 | 16  | 4   | 1 | 38                | 5 | 2 | 4   | 12 | 1    | 41  | 42 | 25     | 1   | 21 | 6      | 76 | 43 | 15 | 48  | 66     | 6  | 21  | 16 | 5 | 6 | 526         |       |

Table 54. Reduced positive indicators attribute (lost [L], unfavourable [U], or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authorities

| Local Authority     | LCG  |  |     |    |     |                   |      |    |   |     | UHM  |    |     | LM     |    |     | LDAG   |   |    |   |    | PMRP   |    |    |     |   |    | 6410 | Total |     |     |
|---------------------|------|--|-----|----|-----|-------------------|------|----|---|-----|------|----|-----|--------|----|-----|--------|---|----|---|----|--------|----|----|-----|---|----|------|-------|-----|-----|
|                     | 6210 |  |     |    |     | partly H6210/6230 |      |    |   |     | 6520 |    |     | (none) |    |     | (none) |   |    |   |    | (none) |    |    |     |   |    |      |       |     |     |
|                     | CG1  |  | CG2 |    | CG7 | L                 | CG10 |    |   | MG3 |      |    | MG5 |        |    | MG8 | U1     |   | U4 |   |    | M23    |    |    | M25 |   |    |      |       | M26 |     |
|                     | F    |  | F   |    |     |                   | F    | U  | L | F   | U    | L  | F   | U      | L  |     | F      | U | F  | U | L  | F      | U  | L  | F   | U | L  |      |       |     | F   |
| Aberdeenshire       |      |  |     |    |     | 1                 | 1    |    |   | 7   |      |    | 3   | 1      |    |     |        |   | 4  |   |    | 1      | 1  |    | 1   |   |    |      | 20    |     |     |
| Borders             | 1    |  | 2   | 13 |     |                   |      | 21 |   |     |      |    | 9   | 2      | 1  |     | 16     | 1 | 32 | 1 |    | 7      | 14 |    | 1   | 1 |    |      | 122   |     |     |
| Dumfries & Galloway |      |  |     |    |     |                   |      |    |   | 1   |      |    | 3   |        | 2  |     |        | 1 | 3  | 4 | 1  | 5      | 2  | 2  | 2   | 1 | 1  |      | 28    |     |     |
| East Ayrshire       |      |  |     |    |     | 1                 |      |    |   |     |      | 3  | 2   |        |    |     |        | 4 | 1  |   |    | 4      |    | 1  |     | 2 |    |      | 18    |     |     |
| Fife                |      |  | 1   | 5  | 2   | 1                 |      | 2  |   | 1   |      |    | 2   | 2      | 3  |     | 5      | 1 | 14 |   | 2  | 3      | 3  |    |     | 2 |    |      | 49    |     |     |
| Highland            |      |  |     |    |     | 9                 |      |    |   | 2   | 2    | 1  | 21  | 8      | 14 |     |        |   | 10 | 3 | 7  | 6      | 15 | 4  | 5   | 4 | 2  | 6    | 119   |     |     |
| Inverclyde          |      |  |     |    |     |                   |      |    |   |     |      |    |     |        |    |     |        | 3 |    |   | 3  | 1      |    | 1  | 1   |   |    |      | 9     |     |     |
| Moray               |      |  |     |    |     | 3                 |      |    |   | 1   |      |    | 3   |        | 1  | 1   |        |   | 4  | 1 | 2  | 2      | 2  |    |     |   |    |      | 20    |     |     |
| North Ayrshire      |      |  |     |    |     | 1                 |      |    |   |     |      |    |     |        |    |     |        |   | 3  | 1 |    | 7      |    |    | 3   |   |    |      | 15    |     |     |
| Renfrewshire        |      |  |     |    |     |                   |      |    |   |     |      |    | 5   |        |    |     |        |   | 5  | 6 |    | 6      | 8  |    |     | 1 |    |      | 31    |     |     |
| South Ayrshire      |      |  |     |    |     | 2                 |      | 1  |   |     |      |    | 2   | 4      | 4  |     |        |   | 2  | 3 |    | 2      | 6  |    | 1   | 3 |    |      | 30    |     |     |
| Stirling            |      |  |     |    |     | 2                 |      |    |   | 2   | 1    |    | 4   | 1      |    |     | 2      |   | 5  | 3 |    | 8      | 3  |    | 7   | 2 |    |      | 40    |     |     |
| West Lothian        |      |  | 1   |    |     |                   |      |    |   |     |      |    | 7   | 1      |    |     | 1      |   | 4  | 3 | 3  | 1      | 4  |    |     |   |    |      | 25    |     |     |
| Total               | 1    |  | 4   | 18 | 2   | 1                 |      | 42 | 1 | 2   |      | 12 | 4   | 1      | 62 | 21  | 25     | 1 | 24 | 3 | 93 | 26     | 15 | 51 | 63  | 6 | 22 | 15   | 5     | 6   | 526 |

Table 55. Negative indicators attribute (lost [L], unfavourable [U], or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authority areas

| Local Authority     | LCG  |     |    |     |   |                   |   |   |     |    | UHM  |     |    | LM     |     |    | LDAG   |    |    |    |     |     | PMRP   |    |     |   |   |     | Total |      |
|---------------------|------|-----|----|-----|---|-------------------|---|---|-----|----|------|-----|----|--------|-----|----|--------|----|----|----|-----|-----|--------|----|-----|---|---|-----|-------|------|
|                     | 6210 |     |    |     |   | partly H6210/6230 |   |   |     |    | 6520 |     |    | (none) |     |    | (none) |    |    |    |     |     | (none) |    |     |   |   |     |       | 6410 |
|                     | CG1  | CG2 |    | CG7 |   | CG10              |   |   | MG3 |    |      | MG5 |    |        | MG8 | U1 |        |    | U4 |    |     | M23 |        |    | M25 |   |   | M26 |       |      |
|                     | U    | F   | F  | U   | L | F                 | U | L | F   | U  | L    | F   | U  | L      | F   | F  | U      | F  | U  | L  | F   | U   | L      | F  | U   | L | F |     |       |      |
| Aberdeenshire       |      |     |    |     |   | 1                 | 1 |   | 2   | 5  |      | 1   | 3  |        |     |    |        | 4  |    |    | 2   |     |        | 1  |     |   |   | 20  |       |      |
| Borders             | 1    | 2   | 12 | 1   |   | 17                | 4 |   |     |    |      | 9   | 2  | 1      |     | 14 | 3      | 23 | 10 |    | 21  |     |        | 2  |     |   |   | 122 |       |      |
| Dumfries & Galloway |      |     |    |     |   |                   |   |   |     | 1  |      | 3   |    | 2      |     | 1  |        | 7  |    | 1  | 7   |     | 2      | 3  |     | 1 |   | 28  |       |      |
| East Ayrshire       |      |     |    |     |   | 1                 |   |   |     |    |      | 4   | 1  |        |     |    |        | 4  | 1  |    | 4   |     |        | 1  |     | 2 |   | 18  |       |      |
| Fife                |      | 1   | 5  | 2   | 1 | 2                 |   | 1 |     |    |      | 1   | 3  | 3      |     | 6  |        | 14 |    | 2  | 6   |     |        | 2  |     |   |   | 49  |       |      |
| Highland            |      |     |    |     |   | 9                 |   |   | 3   | 1  | 1    | 23  | 6  | 14     |     |    |        | 11 | 2  | 7  | 20  | 1   | 4      | 8  | 1   | 2 | 6 | 119 |       |      |
| Inverclyde          |      |     |    |     |   |                   |   |   |     |    |      |     |    |        |     |    |        | 2  | 1  |    | 4   |     |        | 2  |     |   |   | 9   |       |      |
| Moray               |      |     |    |     |   | 3                 |   |   |     | 1  |      | 2   | 1  | 1      | 1   |    |        | 4  | 1  | 2  | 4   |     |        |    |     |   |   | 20  |       |      |
| North Ayrshire      |      |     |    |     |   | 1                 |   |   |     |    |      |     |    |        |     |    |        | 4  |    |    | 6   | 1   |        | 2  | 1   |   |   | 15  |       |      |
| Renfrewshire        |      |     |    |     |   |                   |   |   |     |    |      | 3   | 2  |        |     |    |        | 5  | 6  |    | 12  | 2   |        | 1  |     |   |   | 31  |       |      |
| South Ayrshire      |      |     |    |     |   | 2                 |   | 1 |     |    |      | 4   | 2  | 4      |     |    |        | 4  | 1  |    | 7   | 1   |        | 4  |     |   |   | 30  |       |      |
| Stirling            |      |     |    |     |   | 2                 |   |   | 1   | 2  |      | 1   | 4  |        |     | 1  | 1      | 5  | 3  |    | 10  | 1   |        | 9  |     |   |   | 40  |       |      |
| West Lothian        |      | 1   |    |     |   |                   |   |   |     |    |      | 6   | 2  |        |     | 1  |        | 6  | 1  | 3  | 5   |     |        |    |     |   |   | 25  |       |      |
| Total               | 1    | 4   | 17 | 3   | 1 | 38                | 5 | 2 | 6   | 10 | 1    | 57  | 26 | 25     | 1   | 23 | 4      | 93 | 26 | 15 | 108 | 6   | 6      | 35 | 2   | 5 | 6 | 526 |       |      |

*Table 56. Grass:forb ratio attribute (lost, unfavourable [U], or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authority areas (not relevant to U1, U4, M23, M25 and M26)*

| Local Authority     | LCG  |     |     |                   |    |   |      | UHM  |   |      | LM      |    |      |   | Total |
|---------------------|------|-----|-----|-------------------|----|---|------|------|---|------|---------|----|------|---|-------|
|                     | 6210 |     |     | partly H6210/6230 |    |   |      | 6520 |   |      | (blank) |    |      |   |       |
|                     | CG1  | CG2 | CG7 | CG10              |    |   | MG3  |      |   | MG5  |         |    | MG8  |   |       |
|                     | F    | F   | F   | lost              | F  | U | lost | F    | U | lost | F       | U  | lost | U |       |
| Aberdeenshire       |      |     |     |                   | 1  | 1 |      | 5    | 2 |      |         | 4  |      |   | 13    |
| Borders             | 1    | 2   | 13  |                   | 21 |   |      |      |   |      | 10      | 1  | 1    |   | 49    |
| Dumfries & Galloway |      |     |     |                   |    |   |      | 1    |   |      | 3       |    | 2    |   | 6     |
| East Ayrshire       |      |     |     |                   | 1  |   |      |      |   |      | 3       | 2  |      |   | 6     |
| Fife                |      | 1   | 7   | 1                 | 2  |   | 1    |      |   |      | 4       |    | 3    |   | 19    |
| Highland            |      |     |     |                   | 9  |   |      | 4    |   | 1    | 23      | 6  | 14   |   | 57    |
| Moray               |      |     |     |                   | 3  |   |      | 1    |   |      | 3       |    | 1    | 1 | 9     |
| North Ayrshire      |      |     |     |                   | 1  |   |      |      |   |      |         |    |      |   | 1     |
| Renfrewshire        |      |     |     |                   |    |   |      |      |   |      | 4       | 1  |      |   | 5     |
| South Ayrshire      |      |     |     |                   | 2  |   | 1    |      |   |      | 4       | 2  | 4    |   | 13    |
| Stirling            |      |     |     |                   | 2  |   |      | 2    | 1 |      | 4       | 1  |      |   | 10    |
| West Lothian        |      | 1   |     |                   |    |   |      |      |   |      | 8       |    |      |   | 9     |
| Total               | 1    | 4   | 20  | 1                 | 42 | 1 | 2    | 13   | 3 | 1    | 66      | 17 | 25   | 1 | 197   |

Table 57. Vegetation height attribute (lost [L], unfavourable [U], or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authority areas

| Local Authority     | LCG      |          |          |   | partly<br>H6210/6230 |   |   | UHM<br>6520 |   |    | LM<br>(none) |    |          | LDAG<br>(none) |     |    | PMRP<br>(none) |     |   |   |     |   | 6410<br>M26<br>F | Total |   |   |   |   |   |
|---------------------|----------|----------|----------|---|----------------------|---|---|-------------|---|----|--------------|----|----------|----------------|-----|----|----------------|-----|---|---|-----|---|------------------|-------|---|---|---|---|---|
|                     | 6210     |          | CG7<br>F | L | CG10<br>F            | L | F | U           | L | F  | U            | L  | MG8<br>F | U1<br>F        | F   | U  | L              | M23 |   |   | M25 |   |                  |       |   |   |   |   |   |
|                     | CG1<br>F | CG2<br>F |          |   |                      |   |   |             |   |    |              |    |          |                |     |    |                | F   | U | F | U   | L |                  |       | F | U | L | F | L |
|                     |          |          |          |   |                      |   |   |             |   |    |              |    |          |                |     |    |                |     |   |   |     |   |                  |       |   |   |   |   |   |
| Aberdeenshire       |          |          |          |   | 2                    |   | 1 | 6           |   | 1  | 3            |    |          |                | 4   |    |                | 2   |   |   | 1   |   | 20               |       |   |   |   |   |   |
| Borders             | 1        | 2        | 13       |   | 21                   |   |   |             |   | 8  | 3            | 1  |          | 17             | 32  | 1  |                | 18  | 3 |   | 2   |   | 122              |       |   |   |   |   |   |
| Dumfries & Galloway |          |          |          |   |                      |   |   | 1           |   | 3  |              | 2  |          | 1              | 7   |    | 1              | 7   |   | 2 | 3   | 1 | 28               |       |   |   |   |   |   |
| East Ayrshire       |          |          |          |   | 1                    |   |   |             |   | 2  | 3            |    |          |                | 5   |    |                | 4   |   |   | 1   | 2 | 18               |       |   |   |   |   |   |
| Fife                |          | 1        | 7        | 1 | 2                    | 1 |   |             |   | 1  | 3            | 3  |          | 6              | 11  | 3  | 2              | 6   |   |   | 2   |   | 49               |       |   |   |   |   |   |
| Highland            |          |          |          |   | 9                    |   |   | 4           | 1 | 23 | 6            | 14 |          |                | 9   | 4  | 7              | 21  |   | 4 | 9   | 2 | 6                | 119   |   |   |   |   |   |
| Inverclyde          |          |          |          |   |                      |   |   |             |   |    |              |    |          |                | 3   |    |                | 4   |   |   | 2   |   | 9                |       |   |   |   |   |   |
| Moray               |          |          |          |   | 3                    |   |   | 1           |   | 3  |              | 1  | 1        |                | 4   | 1  | 2              | 4   |   |   |     |   | 20               |       |   |   |   |   |   |
| North Ayrshire      |          |          |          |   | 1                    |   |   |             |   |    |              |    |          |                | 4   |    |                | 7   |   |   | 3   |   | 15               |       |   |   |   |   |   |
| Renfrewshire        |          |          |          |   |                      |   |   |             |   | 3  | 2            |    |          |                | 10  | 1  |                | 14  |   |   | 1   |   | 31               |       |   |   |   |   |   |
| South Ayrshire      |          |          |          |   | 2                    | 1 |   |             |   | 4  | 2            | 4  |          |                | 5   |    |                | 7   | 1 |   | 4   |   | 30               |       |   |   |   |   |   |
| Stirling            |          |          |          |   | 2                    |   |   | 3           |   | 1  | 4            |    |          | 2              | 6   | 2  |                | 10  | 1 |   | 9   |   | 40               |       |   |   |   |   |   |
| West Lothian        |          | 1        |          |   |                      |   |   |             |   | 4  | 4            |    |          | 1              | 5   | 2  | 3              | 5   |   |   |     |   | 25               |       |   |   |   |   |   |
| Total               | 1        | 4        | 20       | 1 | 43                   | 2 | 1 | 15          | 1 | 53 | 30           | 25 | 1        | 27             | 105 | 14 | 15             | 109 | 5 | 6 | 37  | 5 | 6                | 526   |   |   |   |   |   |

Table 58. Litter layer attribute (lost [L], unfavourable [U], or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authority areas

| Local Authority     | LCG  |   |     |   |                      |   |      |    | UHM  |   |    | LM     |    |   | LDAG   |     |    |    |    |     | PMRP   |    |     |   |   |     | Total |      |
|---------------------|------|---|-----|---|----------------------|---|------|----|------|---|----|--------|----|---|--------|-----|----|----|----|-----|--------|----|-----|---|---|-----|-------|------|
|                     | 6210 |   |     |   | partly<br>H6210/6230 |   |      |    | 6520 |   |    | (none) |    |   | (none) |     |    |    |    |     | (none) |    |     |   |   |     |       | 6410 |
|                     | CG1  |   | CG2 |   | CG7                  |   | CG10 |    | MG3  |   |    | MG5    |    |   | MG8    | U1  | U4 |    |    | M23 |        |    | M25 |   |   | M26 |       |      |
|                     | F    | F | F   | L | F                    | U | L    | F  | U    | L | F  | U      | L  | F | F      | F   | U  | L  | F  | U   | L      | F  | U   | L | F |     |       |      |
| Aberdeenshire       |      |   |     |   | 1                    | 1 |      | 6  | 1    |   | 2  | 2      |    |   |        | 3   | 1  |    | 2  |     |        | 1  |     |   |   | 20  |       |      |
| Borders             | 1    | 2 | 13  |   | 21                   |   |      |    |      |   | 11 |        | 1  |   | 17     | 33  |    |    | 21 |     |        | 2  |     |   |   | 122 |       |      |
| Dumfries & Galloway |      |   |     |   |                      |   |      | 1  |      |   | 3  |        | 2  |   | 1      | 7   |    | 1  | 7  |     | 2      | 2  | 1   | 1 |   | 28  |       |      |
| East Ayrshire       |      |   |     |   | 1                    |   |      |    |      |   | 5  |        |    |   |        | 4   | 1  |    | 4  |     |        | 1  |     | 2 |   | 18  |       |      |
| Fife                |      | 1 | 7   | 1 | 2                    |   | 1    |    |      |   | 4  |        | 3  |   | 6      | 10  | 4  | 2  | 6  |     |        | 2  |     |   |   | 49  |       |      |
| Highland            |      |   |     |   | 9                    |   |      | 4  |      | 1 | 29 |        | 14 |   |        | 12  | 1  | 7  | 20 | 1   | 4      | 8  | 1   | 2 | 6 | 119 |       |      |
| Inverclyde          |      |   |     |   |                      |   |      |    |      |   |    |        |    |   |        | 3   |    |    | 4  |     |        | 2  |     |   |   | 9   |       |      |
| Moray               |      |   |     |   | 3                    |   |      | 1  |      |   | 3  |        | 1  | 1 |        | 5   |    | 2  | 4  |     |        |    |     |   |   | 20  |       |      |
| North Ayrshire      |      |   |     |   | 1                    |   |      |    |      |   |    |        |    |   |        | 4   |    |    | 4  | 3   |        | 2  | 1   |   |   | 15  |       |      |
| Renfrewshire        |      |   |     |   |                      |   |      |    |      |   | 5  |        |    |   |        | 10  | 1  |    | 10 | 4   |        |    | 1   |   |   | 31  |       |      |
| South Ayrshire      |      |   |     |   | 2                    |   | 1    |    |      |   | 5  | 1      | 4  |   |        | 5   |    |    | 5  | 3   |        | 1  | 3   |   |   | 30  |       |      |
| Stirling            |      |   |     |   | 2                    |   |      | 1  | 2    |   | 5  |        |    |   | 2      | 5   | 3  |    | 9  | 2   |        | 7  | 2   |   |   | 40  |       |      |
| West Lothian        |      | 1 |     |   |                      |   |      |    |      |   | 8  |        |    |   | 1      | 5   | 2  | 3  | 2  | 3   |        |    |     |   |   | 25  |       |      |
| Total               | 1    | 4 | 20  | 1 | 42                   | 1 | 2    | 12 | 4    | 1 | 80 | 3      | 25 | 1 | 27     | 106 | 13 | 15 | 98 | 16  | 6      | 28 | 9   | 5 | 6 | 526 |       |      |

Table 59. Bare ground attribute (lost [L], unfavourable [U], or favourable [F]) of constituent NVC communities grouped by BAP Priority and Annex I habitats, with numbers of stands, according to local authority areas

| Local Authority     | LCG  |   |     |   |     |                      |   |   |     | UHM  |     | LM     |    |     | LDAG   |    |     |    |    |     | PMRP   |    |    |     |   |     | Total |      |   |
|---------------------|------|---|-----|---|-----|----------------------|---|---|-----|------|-----|--------|----|-----|--------|----|-----|----|----|-----|--------|----|----|-----|---|-----|-------|------|---|
|                     | 6210 |   |     |   |     | partly<br>H6210/6230 |   |   |     | 6520 |     | (none) |    |     | (none) |    |     |    |    |     | (none) |    |    |     |   |     |       | 6410 |   |
|                     | CG1  |   | CG2 |   | CG7 | CG10                 |   |   | MG3 |      | MG5 |        |    | MG8 | U1     |    | U4  |    | L  | M23 |        |    | L  | M25 |   | M26 |       |      |   |
|                     | U    | F | F   | U |     | L                    | F | U | L   | F    | L   | F      | U  |     | L      | F  | F   | U  |    | F   | U      | L  |    | F   | U |     |       | L    | F |
| Aberdeenshire       |      |   |     |   |     | 2                    |   |   |     | 7    |     | 4      |    |     |        |    |     | 4  |    |     |        | 2  |    |     | 1 |     | 20    |      |   |
| Borders             | 1    | 2 | 12  | 1 |     | 21                   |   |   |     |      |     | 11     |    | 1   |        | 5  | 12  | 33 |    |     |        | 21 |    |     | 2 |     | 122   |      |   |
| Dumfries & Galloway |      |   |     |   |     |                      |   |   |     | 1    |     | 3      |    | 2   |        | 1  |     | 7  |    | 1   | 7      |    | 2  | 3   | 1 |     | 28    |      |   |
| East Ayrshire       |      |   |     |   |     | 1                    |   |   |     |      |     | 5      |    |     |        |    |     | 4  | 1  |     | 4      |    |    | 1   | 2 |     | 18    |      |   |
| Fife                |      | 1 | 5   | 2 | 1   | 2                    |   | 1 |     |      |     | 3      | 1  | 3   |        |    | 6   | 14 |    | 2   | 6      |    |    | 2   |   |     | 49    |      |   |
| Highland            |      |   |     |   |     | 9                    |   |   |     | 4    | 1   | 29     |    | 14  |        |    |     | 13 |    | 7   | 21     |    | 4  | 9   | 2 | 6   | 119   |      |   |
| Inverclyde          |      |   |     |   |     |                      |   |   |     |      |     |        |    |     |        |    |     | 3  |    |     | 4      |    |    | 2   |   |     | 9     |      |   |
| Moray               |      |   |     |   |     | 3                    |   |   |     | 1    |     | 3      |    | 1   | 1      |    |     | 5  |    | 2   | 4      |    |    |     |   |     | 20    |      |   |
| North Ayrshire      |      |   |     |   |     |                      | 1 |   |     |      |     |        |    |     |        |    |     | 3  | 1  |     | 6      | 1  |    | 3   |   |     | 15    |      |   |
| Renfrewshire        |      |   |     |   |     |                      |   |   |     |      |     | 4      | 1  |     |        |    |     | 9  | 2  |     | 13     | 1  |    | 1   |   |     | 31    |      |   |
| South Ayrshire      |      |   |     |   |     | 1                    | 1 | 1 |     |      |     | 5      | 1  | 4   |        |    |     | 4  | 1  |     | 7      | 1  |    | 4   |   |     | 30    |      |   |
| Stirling            |      |   |     |   |     | 2                    |   |   |     | 3    |     | 5      |    |     |        | 1  | 1   | 7  | 1  |     | 11     |    |    | 9   |   |     | 40    |      |   |
| West Lothian        |      | 1 |     |   |     |                      |   |   |     |      |     | 8      |    |     |        | 1  |     | 6  | 1  | 3   | 5      |    |    |     |   |     | 25    |      |   |
| Total               | 1    | 4 | 17  | 3 | 1   | 41                   | 2 | 2 | 16  | 1    | 80  | 3      | 25 | 1   | 8      | 19 | 112 | 7  | 15 | 111 | 3      | 6  | 37 | 5   | 6 |     | 526   |      |   |

### APPENDIX 3. DESCRIPTIONS OF RECORDED CONSTITUENT NVC COMMUNITIES

#### **CG1 *Festuca ovina*-*Carlina vulgaris* grassland (BAP = LCG; Annex I = H6210)**

This NVC community was found only once in this survey, at a coastal site in the Borders. It consists here of nearly 1 ha of patchy vegetation scattered along about 400 m length of very steep S- to ESE-facing slope with much bare soil and rock. The CG1 vegetation is made up mostly of low mats of *Helianthemum nummularium* and *Thymus polytrichus*, and scattered tufts of *Brachypodium sylvaticum*, *Sanguisorba minor*, *Centranthus ruber*, *Teucrium scorodonia* and *Festuca ovina*. Other species occurring in smaller quantity include *Plantago lanceolata*, *Carlina vulgaris*, *Centaurea nigra*, *Bellis perennis* and the moss *Weissia controversa*.

The abundance of *Brachypodium sylvaticum* and *Centranthus ruber* is atypical of any type of calcareous grassland NVC community, but when considering the total flora the vegetation is clearly best described as a type of lowland calcareous grassland. It had been previously classified as CG2, but in this survey was considered to be closest to CG1 mainly because of the scarcity of *Carex flacca* and *Helictotrichon pratense*, and the absence of *Briza media*. In addition the widely (but thinly) scattered *Carlina vulgaris* and the abundance of the moss *Weissia controversa* point more to CG1 than to CG2. The steep, rocky slope habitat is typical of CG1. The vegetation has much in common with CG7 but differs in having more *Carlina vulgaris* and *Sanguisorba minor*, and less *Pilosella officinarum*.

At the sub-community level this CG1 is closest to the *Koeleria macrantha* sub-community CG1e.

CG1 has a markedly south-western distribution in Britain. As far as we know this is the only record of this community in Scotland. Its occurrence here is therefore of considerable interest. The flora of this particular site includes a good representation of species with predominantly southern distributions in Britain: *Carlina vulgaris*, *Sanguisorba minor*, *Rubus caesius*, *Leontodon hispidus* and *Origanum vulgare*. Sites with such a strong southern element in their flora are rare in Scotland. The CG1 here includes the only findings of *Carlina vulgaris* and *Sanguisorba minor* in this survey.

This CG1 is in unfavourable condition because of the abundance of scrub (mainly gorse).

#### **CG2 *Festuca ovina*-*Helictotrichon pratense* grassland (BAP = LCG; Annex I = H6210)**

This community was found at only four sites in this survey: two sites in the Borders, one in Fife and one in West Lothian. It is short grassland in which swards of *Festuca ovina*, *F. rubra*, *Helictotrichon pratense*, *Briza media*, *Trisetum flavescens*, *Carex flacca* and *C. caryophyllea* are accompanied by low mats of *Thymus polytrichus* and *Helianthemum nummularium* and varied amounts of other species including *Lotus corniculatus*, *Pilosella officinarum*, *Pimpinella saxifraga*, *Linum catharticum*, *Plantago lanceolata*, *Euphrasia* agg., *Prunella vulgaris*, *Galium verum*, *Centaurea nigra*, *Polygala vulgaris*, *Hypochaeris radicata*, *Leontodon autumnalis* and the mosses *Hypnum lacunosum*, *Homalothecium lutescens*, *Rhytidiadelphus triquetrus*, *Hylocomium splendens*, *Weissia controversa*, *Fissidens dubius* and *Thuidium assimile*.

CG2 was found mainly on dry, S-facing slopes. It is extensive (>5 ha) at one of the Borders sites but occupies less than 0.2 ha at each of the other three sites.

At all sites where CG2 was recorded in this survey, the classification to this community was based on the abundance of at least one of *Carex flacca*, *Briza media* and *Helictotrichon*

*pratense* (these three species being no more than scarce in CG1 and CG7) combined with low mats of *Thymus polytrichus* and/or *Helianthemum nummularium*, and the scarcity or absence of the 'upland grassland' species (found in CG10) *Agrostis capillaris*, *Anthoxanthum odoratum*, *Nardus stricta* and *Potentilla erecta*. All of this CG2 is best classified as the *Dicranum scoparium* sub-community CG2d. At the two Borders sites the CG2 flora includes the southern species *Leontodon hispidus* (at one site) and *Scabiosa columbaria* (at the other site); this further strengthens the assignment of the vegetation to CG2. At the Fife and West Lothian sites no southern species were found. It should be noted that *Carex flacca*, *Briza media* and *Helictotrichon pratense* can all occur plentifully in CG10, but there they are accompanied by a good representation of at least one of *Agrostis capillaris*, *Anthoxanthum odoratum*, *Nardus stricta* and *Potentilla erecta*.

CG2 was found to be in favourable condition at all four of its sites in this survey, but a small proportion of the largest extent (in the Borders) is now ungrazed and might in future develop into taller MG1.

CG2 is a southern community that is rare in Scotland. The >5 ha of CG2 mapped at one of the Borders sites in 2010 is likely to be the largest extent of CG2 in Scotland. CG2 had previously been recorded at five additional sites in this survey (four in the Borders and one in Fife), but from the 2010-2011 surveys those records are now considered to be erroneous.

**CG7 *Festuca ovina*-*Hieracium pilosella*-*Thymus polytrichus* grassland** (BAP = LCG; Annex I = H6210)

This community was found at 20 sites: 13 in the Borders and 7 in Fife. It is short grassland in which swards of *Festuca ovina*, *Koeleria macrantha*, *Trisetum flavescens* and *Carex caryophyllea* are accompanied by low mats of *Thymus polytrichus* and *Helianthemum nummularium* and varied amounts of other species including *Lotus corniculatus*, *Pilosella officinarum*, *Plantago lanceolata*, *Prunella vulgaris*, *Galium verum*, *Campanula rotundifolia*, *Dianthus deltoides*, *Aphanes arvensis*, *Aira praecox*, *A. caryophyllea*, *Arenaria serpyllifolia*, *Sedum acre*, *Trifolium striatum*, *Anthyllis vulneraria*, *Hypochaeris radicata*, *Leontodon autumnalis*, *Taraxacum* agg., the mosses *Hypnum lacunosum*, *Polytrichum juniperinum*, *Brachythecium albicans*, *Bryum capillare* and *Grimmia pulvinata*, and the lichen *Cladonia rangiformis*. At most sites it occupies small areas with thin, dry, patchy soils on moderate to steep, rocky, S-facing slopes. It is commonly in association with U1 grassland and W23 gorse scrub.

CG7 has a mainly southern distribution in Britain, and is uncommon in Scotland where it appears to be confined to the south-east. It is the main habitat of the nationally uncommon Maiden Pink *Dianthus deltoides* in Scotland; indeed, the Borders is one of Britain's hotspots for this species. Some of it is notably species-rich, with up to 11 positive indicator species in a 1m<sup>2</sup> quadrat.

The CG7 found in this survey shares many species with the commoner and much more widespread CG10 community, from which it differs mainly in the scarcity or absence of *Agrostis capillaris*, *Anthoxanthum odoratum* and *Potentilla erecta*. It can also come close floristically to U1, which also shares this habitat of thin, patchy soils on rocky slopes. U1, however, has less *Thymus polytrichus* and *Helianthemum nummularium*, and more *Rumex acetosella* than CG7; this difference reflects the more acidic soils on which U1 develops. *Dianthus deltoides* is another good pointer for CG7, but it can also occur sparingly in U1, as at two Borders sites in this survey.

At the sub-community level, the CG7 found in this survey is generally closest to the *Koeleria macrantha* sub-community CG7a.

Most of the CG7 found in this survey is in favourable condition, but in a few places it is in unfavourable condition because of abundant gorse or (rarely) a shortage of positive indicator species.

**CG10 *Festuca ovina*-*Agrostis capillaris*-*Thymus polytrichus* grassland** (BAP = LCG; Annex I = H6210 if on limestone, H6230 if in mountain areas but not on limestone, otherwise none)

This community was found at 43 sites scattered widely in Scotland, with the largest concentration in the Borders. CG10 is short grassland in which swards of *Festuca ovina*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Koeleria macrantha*, *Trisetum flavescens*, *Cynosurus cristatus* and *Carex caryophyllaea* are accompanied by low mats of *Thymus polytrichus* and *Helianthemum nummularium* and varied amounts of other species including *Lotus corniculatus*, *Pilosella officinarum*, *Plantago lanceolata*, *Prunella vulgaris*, *Galium verum*, *Campanula rotundifolia*, *Potentilla erecta*, *Succisa pratensis*, *Hypochaeris radicata*, *Leontodon autumnalis*, *Taraxacum* agg., with mosses including *Hypnum lacunosum*, *Hylocomium splendens*, *Thuidium tamariscinum*, *Dicranum scoparium* and *Rhytidiadelphus squarrosus*. At most sites it occupies thin, well-drained soils on moderate to steep, rocky, S-facing slopes. Some of it occurs on northerly aspects, where it tends to be more mossy.

Assignment of vegetation to the CG10 community was generally straightforward. This is not surprising, as CG10 is widespread and at least locally common in Scotland, where it is the main calcareous grassland community. Among the surveyed sites there is regional variation in the dominant sub-community: the damper *Carex pulicaris*-*Carex panicea* sub-community CG10b in Lochaber and Skye and the drier *Trifolium repens*-*Luzula campestris* sub-community CG10a elsewhere. This pattern reflects the wetter climate in Lochaber and Skye compared with the other areas covered by this survey. In the Borders, both CG10 and CG7 occur at some sites, and in some cases it was not immediately clear whether to class the grassland as CG7 or CG10 but a decision was eventually made, most commonly on the basis of the abundance of *Agrostis capillaris*, *Anthoxanthum odoratum* and *Potentilla erecta* (these species more common in CG10) and in some cases also taking note of populations of *Dianthus deltoides* (this species growing mainly in CG7).

Most of the CG10 found in 2010-2011 was assessed as being in favourable condition. Most of it was grazed well enough to keep the vegetation short and thereby prevent taller, more vigorous species from becoming dominant and limiting the diversity of small, low-grown species. Some of this CG10 was found to be notably species-rich, with up to 14 positive indicator species in a single 1m<sup>2</sup> quadrat. Notable species found in CG10 in this survey included *Galium steneri*, *G. boreale*, *Briza media*, *Platanthera chlorantha*, *Gymnadenia conopsea*, *Gentianella campestris* and *Antennaria dioica*. At five sites the CG10 was found to be in unfavourable condition because of the abundance of bracken (at four sites in the Borders) or abundant rank grasses, too much litter and a shortage of positive indicator species (at one site in Aberdeenshire).

**MG3 *Anthoxanthum odoratum*-*Geranium sylvaticum* meadow** (BAP = UHM; Annex I = H6520)

This uncommon community was found at 17 sites in this survey. MG3 is unimproved neutral grassland which generally resembles MG5 (see below) but with the herb assemblage including *Geranium sylvaticum*, *Trollius europaeus* or *Cirsium heterophyllum*. It follows from this that MG3 has a northern, upland distribution in Britain. It is therefore not surprising that the sites where it was found in this survey are almost all in areas with a cool and/or wet,

upland type of climate: in Aberdeenshire (along the River Dee, with only the most downstream sites being in more of a lowland area), Morayshire, Lochaber, Skye, Stirlingshire (where one of the three sites is in a lowland area near Dunblane) and Dumfries & Galloway (quite well into the hills, between Dumfries and Sanquhar).

Most of the MG3 found in this survey has a flora largely shared with MG5 (but including *Geranium sylvaticum*, *Trollius europaeus* or *Cirsium heterophyllum*) but is not very species-rich and contains much *Arrhenatherum elatius* and/or *Dactylis glomerata*. These rather tall, rank examples of MG3 belong to the *Arrhenatherum elatius* sub-community MG3c. Some MG3 found in Lochaber and Skye is less rank and rather more species-rich, and belongs to the *Briza media* sub-community MG3b.

Most of the MG3 found in this survey was in unfavourable condition as a result of insufficient grazing or mowing; it was too tall and contained too much in the way of rank grasses such as *Dactylis* and *Arrhenatherum*. At only four sites was the MG3 found to be in favourable condition: two of these are in Lochaber, one is in Aberdeenshire and one in Stirlingshire. However, this situation may not be entirely representative of MG3 more widely because a significant proportion of the surveyed MG3 stands were by the River Dee.

There were previous records of MG3 from an additional six sites. At one of these (in Lochaber) the MG3 appears to have been lost since the time of the previous survey. At the other five sites (in Renfrewshire, Fife and the Borders) the old MG3 record is considered to be erroneous and was mostly recorded in 2010-2011 as MG5.

**MG5 *Cynosurus cristatus*-*Centaurea nigra* meadow and pasture** (BAP = LM; Annex I = none)

This is unimproved neutral grassland with short to medium height swards of grasses such as *Cynosurus cristatus*, *Festuca rubra*, *Holcus lanatus*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Poa pratensis* and *Trisetum flavescens*, mixed with forbs such as *Centaurea nigra*, *Plantago lanceolata*, *Trifolium pratense*, *T. repens*, *Rhinanthus minor*, *Lathyrus pratensis*, *Galium verum*, *Lotus corniculatus*, *Prunella vulgaris*, *Ranunculus acris*, *Hypochaeris radicata*, *Leontodon autumnalis*, *Pimpinella saxifraga*, *Leucanthemum vulgare*, *Succisa pratensis*, *Rumex acetosa*, *Potentilla erecta*, *Filipendula ulmaria*, *Vicia cracca* and *Euphrasia* agg. Many other species occur more sparsely, including some of particular interest such as *Platanthera chlorantha*, *Gymnadenia conopsea*, *Carum verticillatum* and *Alchemilla* spp. Mosses are generally sparse and not very diverse.

MG5 was found at 87 sites in this survey. These sites are fairly evenly scattered through the regions in which survey took place.

MG5 was found on level to moderately sloping ground with well drained soils that are evidently deeper than those supporting U1, U4, CG1-2, CG7 and CG10 grasslands. Hence the swards are generally dense and continuous, with few or no patches of bare ground. At some sites the habitat is managed as permanent pasture; at others it is managed as hay meadow; occasionally it is unmanaged.

NVC determination of MG5 was generally quite straightforward in this survey. Some MG5 was found to be floristically close to the more mesotrophic examples of U4, but were distinguished from U4 by having a better representation of characteristic MG5 species (especially *Cynosurus cristatus*, *Centaurea nigra*, *Trifolium pratense*, *Rhinanthus minor*, *Plantago lanceolata*, *Platanthera chlorantha*, *Leucanthemum vulgare*, *Lathyrus pratensis*, *Prunella vulgaris* and *Euphrasia* agg.) than of characteristic U4 species such as *Potentilla erecta*, *Galium saxatile*, *Nardus stricta*, *Deschampsia flexuosa*, *Stellaria graminea*, *Conopodium majus*, *Lathyrus linifolius*, *Viola lutea*, *Polygala serpyllifolia* and the moss

*Hylocomium splendens*. Some relatively herb-poor MG5 is very similar to the non-NVC species-poor neutral grassland, which is even more herb-poor and grassy, and some MG5 has probably been lost to this species-poor grassland and in this same region there has been limited loss to housing construction.

MG5 has much in common with MG3, but MG3 was generally distinguished quite readily by the presence of *Geranium sylvaticum* or, in the absence of that species, *Trollius europaeus* and/or *Cirsium heterophyllum*.

At nearly half of its sites MG5 was found to be in favourable condition. Where it was found to be in unfavourable condition this was most commonly because of a shortage of positive indicator species, too great a cover of negative indicators and/or insufficient cover of forbs. These three factors are commonly inter-related and associated in this survey with both undergrazing and agricultural intensification.

For discussion of non-NVC species-poor grassland, some of which appears to have been derived from MG5, refer to 'Species-poor grassland with no NVC equivalent' in the Discussion in the main part of this report.

#### **MG8 *Cynosurus cristatus*-*Caltha palustris* grassland (BAP = LM; Annex I = none)**

This uncommon community was found only once in this survey, at a site in Morayshire. This vegetation has abundant *Cynosurus cristatus* and *Caltha palustris*, frequent *Festuca rubra*, *Ranunculus acris*, *Trifolium repens*, *Rumex acetosa*, *Succisa pratensis*, *Equisetum palustre* and locally abundant *Potentilla anserina*, *Tussilago farfara* and *Montia fontana*, and occasional *Holcus lanatus*, *Poa pratensis*, *Briza media*, *Carex panicea*, *Juncus articulatus*, *Trifolium pratense*, *Cirsium palustre*, *Plantago lanceolata*, *Euphrasia officinalis* agg., *Cerastium fontanum*, *Cardamine pratensis*, and *Ranunculus flammula*. This MG8 occurs at 340-350 m altitude, on wet ground within a larger area of sheep-grazed pasture including improved and semi-improved grasslands, damp rushy grassland, base-enriched sedge flushes and herb-dominated vegetation in drains, runnels and a burn. This MG8 was found to be in unfavourable condition because of a shortage of positive indicator species and insufficient forb cover.

At two other sites in this survey (one in Fife and one in Stirlingshire) there were previous records of MG8, but these are now considered to have been erroneous interpretations of M23 vegetation.

#### **U1 *Festuca ovina*-*Agrostis capillaris*-*Rumex acetosella* grassland (BAP = LDAG; Annex I = none)**

This community was found at 27 sites, the distributions of which show a south-eastern tendency: 17 sites in the Borders, 6 in Fife, 2 in Stirlingshire, 1 in West Lothian and 1 in Dumfries & Galloway. The vegetation is short grassland in which scattered tufts of *Festuca ovina* are generally abundant and accompanied by a range of other species including *Agrostis capillaris*, *Koeleria macrantha*, *Aira praecox*, *A. caryophyllea*, *Rumex acetosella*, *Aphanes arvensis*, *Pilosella officinarum*, *Lotus corniculatus*, *Plantago lanceolata*, *Galium saxatile*, *G. verum*, *Campanula rotundifolia*, *Arenaria serpyllifolia*, *Geranium molle*, *Poa annua*, *Sedum acre*, *Achillea millefolium*, *Hypochaeris radicata*, *Leontodon autumnalis*, *Taraxacum* agg., the mosses *Hypnum cupressiforme*, *Polytrichum piliferum*, *P. juniperinum*, *Brachythecium albicans*, *Ceratodon purpureus*, *Dicranum scoparium* and *Rhytidiadelphus squarrosus*, and lichens of the genus *Cladonia*. Where U1 occurs in close association with improved grasslands it can include scattered plants of *Lolium perenne* and *Trifolium repens*, and a weedy element including *Senecio jacobaea*, *Cirsium arvense* and *C. vulgare*. *Dactylis glomerata* can be quite common, especially in these 'semi-improved' examples of U1.

Where it grows in U1 it is mainly as small, short tufts quite different from the much larger and taller tussocks seen in MG1 grassland.

U1 generally occupies thin, dry, patchy soils on moderate to steep, rocky slopes, especially facing south. It is commonly in association with W23 gorse scrub and/or (in south-east Scotland) CG7 grassland on similarly rocky slopes, and, where rock outcrops thin out and the soils become deeper and more continuous, U4 acid grassland and MG6/7 improved grasslands.

U1 shares many species – and the dry, rocky slope habitat – with CG7 grassland, from which it differs mainly in having little or no *Thymus polytrichus* or *Helianthemum nummularium*, and correspondingly greater quantities of *Rumex acetosella* and the mosses *Polytrichum piliferum*, *P. juniperinum* and *Ceratodon purpureus*. *Dianthus deltoides* is conspicuously common in many examples of CG7 too, but can also occur here and there in U1, so it is not a reliable indicator of CG7 unless accompanied by much thyme and/or rockrose.

U1 also shares many species with U4 grassland but looks quite different on account of its patchiness, with the vegetation typically broken up by areas of bare soil and rock outcrops. Compared with U4, U1 occurs on thinner soils, has less *Anthoxanthum odoratum*, *Potentilla erecta*, *Viola* spp., *Lathyrus* spp., *Rhytidiadelphus squarrosus* and *Hylocomium splendens*, and more *Rumex acetosella*, *Aira* spp. and *Aphanes arvensis*.

Most of the U1 found in this survey was classified to NVC community level only, but much of it appears closest to the *Anthoxanthum odoratum*-*Lotus corniculatus* sub-community U1d, and some is closer to the Typical sub-community U1b, the *Galium saxatile*-*Potentilla erecta* sub-community U1e or the *Hypochaeris radicata* sub-community U1f.

Most of the U1 at these sites is in favourable condition, but a few examples are classed as unfavourable, mainly because they contain an abundance of negative indicator species such as *Lolium perenne*, *Dactylis glomerata* and *Senecio jacobaea*, and/or because they have too few positive indicator species. In general the U1 that is closely associated with U4, CG7 or CG10 grassland is in better condition than that occurring adjacent to improved grassland.

**U4 *Festuca ovina*-*Agrostis capillaris*-*Galium saxatile* grassland** (BAP = LDAG; Annex I = none)

This community is widespread and common among the survey sites; it was found at 121 sites, making it the most common priority grassland NVC type in this survey. It is short grassland with swards of *Festuca ovina*, *Agrostis capillaris* and *Anthoxanthum odoratum*, and variable amounts of other grasses, especially *Holcus lanatus*, *Festuca rubra*, *Cynosurus cristatus*, *Danthonia decumbens*, *Nardus stricta* and *Deschampsia flexuosa*. Other graminoids can include *Carex pilulifera*, *C. binervis* and *Luzula multiflora*. Small herbs are very common and typically include *Potentilla erecta*, *Galium saxatile*, *Campanula rotundifolia*, *Viola riviniana*, *Polygala serpyllifolia*, *Veronica chamaedrys*, *V. officinalis*, *Plantago lanceolata* and *Rumex acetosa*. Mosses are common, especially *Rhytidiadelphus squarrosus*, *Hylocomium splendens*, *Thuidium tamariscinum*, *Pseudoscleropodium purum* and *Dicranum scoparium*.

Four of the five sub-communities of U4 were found in this survey:

U4a Typical sub-community: as described above. Widespread and common mainly on steep to moderate slopes.

U4b *Holcus lanatus-Trifolium repens* sub-community: includes much *Holcus lanatus*, *Trifolium repens* and *Achillea millefolium*. Mosses tend to be less diverse than in U4a. The vegetation as a whole can be species-poor and quite different from the floristically richer examples of U4a and U4c. Widespread and common, extending onto flatter, semi-improved ground.

U4c *Lathyrus montanus-Stachys betonica* sub-community: like U4a but with a richer herb assemblage (indicating less acidic, mild flushed soils) including *Lathyrus linifolius*, *Galium verum*, *Lotus corniculatus*, *Viola lutea*, *Pilosella officinarum* and *Helianthemum nummularium*. *Trisetum flavescens* can be common here too. U4c is common on well-drained slopes (especially facing N) in the Borders, and is thinly scattered elsewhere with records from Skye, Aberdeenshire and Ayrshire. It is rather uncommon in Britain; perhaps better known from parts of England and Wales (where it commonly includes *S. officinalis*), it is locally common in the Scottish Borders (as seen in this survey) and some limestone areas of the SE Highlands (records from other surveys).

U4e *Vaccinium myrtillus-Deschampsia flexuosa* sub-community: includes much *Deschampsia flexuosa* and/or *Vaccinium myrtillus*, and found on more strongly acid soils at three sites, in Aberdeenshire, Fife and the Borders; a sub-community found in Britain mainly at moderate to high altitudes in upland areas.

For the most part the U4 community did not present difficulties with classification in this survey. This is not surprising given that it is such a common and well known community. However, in some of the more herb-rich and more mesotrophic examples it took some time and thought to decide between U4 and MG5 neutral grassland: this decision was made on the basis of the relative amounts of (a) species more common in U4 than in MG5 (especially *Potentilla erecta*, *Galium saxatile*, *Nardus stricta*, *Deschampsia flexuosa*, *Stellaria graminea*, *Conopodium majus*, *Lathyrus linifolius*, *Viola lutea*, *Polygala serpyllifolia* and the moss *Hylocomium splendens*) and (b) those commoner in MG5 (especially *Cynosurus cristatus*, *Centaurea nigra*, *Trifolium pratense*, *Rhinanthus minor*, *Plantago lanceolata*, *Platanthera chlorantha*, *Leucanthemum vulgare*, *Lathyrus pratensis*, *Prunella vulgaris* and *Euphrasia* agg.). Some of the relatively mesotrophic but herb-poor examples of U4 are very similar to relatively herb-poor forms of MG5, and at some sites (especially hay meadows that appear to be semi-improved) it was hard to decide whether to class herb-poor grassland as either of these two types or as a separate, non-NVC species-poor neutral grassland that is even more herb-poor and strongly grass-dominated (see below).

U4 also has much in common floristically with CG10, but the two communities were generally easy to separate from each other by the relative quantities of *Galium saxatile* (very common in U4 but rare in CG10) and *Thymus polytrichus* (very common in CG10 but rare in U4).

At well over half of its sites, U4 was found to be in favourable condition. Where it was found to be in unfavourable condition this was most commonly because of a shortage of positive indicator species or too great an extent of negative indicator species such as bracken. Where species-poor, U4 was typically U4b; some of this U4b had not been previously recorded since the original surveys highlighted grassland features of more note.

**M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture** (BAP = PMRP; Annex I = none)

This type of rush mire was found to be widespread and common in this survey, on damp to wet soils on level to gently sloping ground. It was found at a total of 119 sites, making it the second commonest priority NVC type found in the survey (the commonest was U4, found at 121 sites).

This vegetation is dominated by tall swards of rushes: *Juncus acutiflorus* (dominant in the *J. acutiflorus* sub-community M23a) and *J. effusus* (dominant in the *J. effusus* sub-community M23b). Both sub-communities were found in this survey, with M23a being the commonest. The associated assemblage of mesotrophic herbs includes *Galium palustre*, *G. uliginosum*, *Filipendula ulmaria*, *Cirsium palustre*, *Epilobium palustre*, *Cardamine pratensis*, *Lotus pedunculatus*, *Achillea ptarmica*, *Angelica sylvestris*, *Ranunculus acris*, *R. repens*, *Rumex acetosa*, *Lychnis flos-cuculi*, *Mentha aquatica*, *Caltha palustris*, *Valeriana officinalis*, *Potentilla palustris*, *Hydrocotyle vulgaris*, *Geum rivale* and *Succisa pratensis*. *Valeriana dioica* occurs in some M23 mires in the Borders. *Viola palustris* is common in many stands of M23, but is also tolerant of more acidic soils (as in M6 mires). Various grasses grow commonly in M23, especially *Holcus lanatus*, *Festuca rubra*, *Agrostis capillaris*, *Anthoxanthum odoratum* and *Deschampsia cespitosa*. Sedges can be common, and include *Carex nigra*, *C. panicea*, *C. flacca*, *C. echinata* and *C. disticha*. Mosses found commonly in M23 in this survey include *Rhytidiadelphus squarrosus*, *Calliergonella cuspidata*, *Brachythecium rivulare* and *B. rutabulum*. Liverworts are more patchy, but *Lophocolea bidentata* is quite common here. Lichens are absent from most of this vegetation.

In general the classification of stands of vegetation to M23 was not problematic, but attention had to be paid to floristic details in situations where the vegetation showed some degree of transition toward another rush-dominated community. Where the vegetation was of a slightly more acidophilous nature it showed affinities to the M6 community (which was also encountered at some sites). Differentiation between M23 and M6 was based on the relative amounts of (a) mesotrophic herbs and mosses listed above (typical of M23) and (b) *Sphagnum* and *Polytrichum commune* mosses (typical of M6). Drier examples of M23 can come close floristically to MG10 rushy grassland, in which there is typically a co-dominance of *Juncus effusus* (or in some places *J. inflexus*) and grasses including *Holcus lanatus*, *Agrostis stolonifera* and *Deschampsia cespitosa*, and a more limited range of herbs and mosses than in M23. MG10 was found at many sites too, for example in damper areas within or adjacent to improved grasslands. There are also drier, species-poor forms of *Juncus effusus* vegetation in which the associated flora has more in common with acid grasslands and includes species such as *Agrostis capillaris*, *Nardus stricta*, *Potentilla erecta* and *Galium saxatile*. This '*Juncus effusus* acid grassland' has been found widely in Britain (especially in upland areas) but is not described in the NVC. Drier forms of M23a mire, where *J. acutiflorus* is abundant to dominant, can be relatively grassy and species-poor with associated floras that have much in common with MG10 but were not assigned to that community because the dominant rush was *J. acutiflorus*. Some of the M23 in unfavourable condition for its positive indicator species (see below) was of this description. If MG10 were to have an additional *J. acutiflorus* sub-community, this vegetation would be better accommodated in it.

At some sites there was a co-existence of *Juncus* and *Molinia caerulea*, in mosaics of M23 (*Juncus*-dominated) and M25 (*Molinia*-dominated) or in either of these two communities but with one of *Juncus* and *Molinia* clearly subordinate to the other. Some rush-dominated vegetation was classed initially as M26 because it contained *Crepis paludosa* and/or *Trollius europaea*; this is now considered to be best placed in M23, especially as it contains little or no *Molinia* (see discussion under M26 below).

For discussion of positive indicators in M23, and reasons why the positive indicator list for this community might be lengthened, refer to 'Discussion of M23 positive indicators' in the Discussion in the main part of this report.

#### **M25 *Molinia caerulea*-*Potentilla erecta* mire (BAP = PMRP; Annex I = none)**

This type of tussocky grassland dominated by *Molinia caerulea* was found at 39 sites in this survey. Most of these sites are from Stirlingshire westwards, reflecting the generally greater

abundance of *Molinia* and M25 in the west; indeed in some areas of western Scotland M25 is one of the most common and extensive types of semi-natural vegetation. M25 was found on damp to wet soils on level to gently sloping ground.

Growing among the *Molinia* tussocks in the M25 encountered in this survey are varied assemblages of other, mainly smaller plants including *Potentilla erecta*, *Succisa pratensis*, *Pedicularis sylvatica*, *Dactylorhiza maculata* and *Viola palustris*. The rushes *Juncus effusus*, *J. conglomeratus* and *J. acutiflorus* can be common but are sparser than in M23 rush mire.

At many sites the M25 also includes mesotrophic herbs such as *Galium palustre*, *G. uliginosum*, *Filipendula ulmaria*, *Epilobium palustre*, *Cirsium palustre*, *Lotus pedunculatus*, *Achillea ptarmica*, *Angelica sylvestris*, *Ranunculus acris*, *Lychnis flos-cuculi*, *Caltha palustris*, *Valeriana officinalis*, *Parnassia palustris*, *Centaurea nigra*, *Potentilla palustris*, *Hydrocotyle vulgaris* and *Geum rivale*. These species are all shared with M23 rush mire, and assemblages of them in M25 indicate the *Angelica sylvestris* sub-community M25c; in terms of soils this is the least acidic of the three sub-communities of M25. M25c was found throughout most of the range of M25 records in this survey.

The most acidic sub-community is the *Erica tetralix* sub-community M25a, which includes species such as *Calluna vulgaris*, *Erica tetralix*, *Narthecium ossifragum* and *Sphagnum* spp. This has floristic affinities with wet heath and bog vegetation. It is the most extensive type of M25 in western Britain generally, and was found in this survey in Lochaber and Skye, and at one site in Aberdeenshire.

The *Anthoxanthum odoratum* sub-community M25b was also found at some sites in Skye and Lochaber, and in very small quantity at one site in the Borders. The grasses *A. odoratum* and *Holcus lanatus* are generally common in this sub-community, along with species found in drier acid grasslands: for example *Galium saxatile*, *Rumex acetosa*, *Luzula multiflora*, *Holcus mollis*, *Deschampsia flexuosa*, *Festuca ovina*, *F. vivipara*, *F. rubra* and *Nardus stricta*. M25b is generally the least distinctive of the three sub-communities of M25, and can appear transitional toward U4 or U5 drier acid grassland.

Just over half of the sampled stands of M25 were found to be in favourable condition. Those that were unfavourable were assessed as such mainly because they had too few positive indicator species, though dead grass litter was also unfavourably extensive at some sites.

#### **M26 *Molinia caerulea*-*Crepis paludosa* fen (BAP = PMRP; Annex I = H6410)**

This nationally uncommon community was recorded at seven sites in Lochaber and Skye, on damp to wet soils on level to gently sloping ground. It resembles M25c (see above) in that tussocks of *Molinia caerulea* are abundant to dominant and are accompanied by an assemblage of herbs such as *Potentilla erecta*, *Succisa pratensis*, *Viola palustris*, *Galium palustre*, *G. uliginosum*, *Filipendula ulmaria*, *Epilobium palustre*, *Cirsium palustre*, *Lotus pedunculatus*, *Achillea ptarmica*, *Angelica sylvestris*, *Ranunculus acris*, *Lychnis flos-cuculi*, *Caltha palustris*, *Valeriana officinalis*, *Parnassia palustris*, *Geum rivale* and *Centaurea nigra*. The stands classed in this survey as M26 were assigned to the *Festuca rubra* sub-community M26b and were separated from M25 because they contained *Crepis paludosa* and/or *Trollius europaeus*. Most of this M26 was assessed as being in favourable condition; the only exception was a stand that could not be accessed properly, so no condition assessment could be made.

M26 (whose occurrence constitutes Annex I H6410 habitat in Scotland) is a community to which people in various surveys in Scotland have collectively assigned a wide range of vegetation types. It is a rather 'difficult' community whose definition has been interpreted in varying ways, even by knowledgeable and experienced surveyors. This variation can lead to

confusion or difficulty, for two main reasons: (1) the wide range of species used to define M26, ranging from northern/upland species to mixtures of northern and more southern species and assemblages of species indicative of base-enrichment, reduces the clarity with which the community is defined and interpreted, and (2) some of the vegetation that has been assigned to M26 can be assigned equally well or better to other NVC types. These matters are discussed in more detail below, under headings corresponding to different types of vegetation that have been assigned to M26.

*Molinia*-dominated vegetation containing *Crepis paludosa* and/or *Trollius europaeus*

Scattered plants of *Crepis paludosa* and/or *Trollius europaeus* occur locally in *Molinia*-dominated vegetation in northern Britain. In such places the vegetation otherwise fits well into M25c *Molinia caerulea*-*Potentilla erecta* mire, *Angelica sylvestris* sub-community without disrupting the floristic integrity of that sub-community and without suggesting a clear difference in soils, climate or management. A similar situation exists within M23 *Juncus effusus*/*acutiflorus*-*Galium palustre* rush-pasture, M27 *Filipendula ulmaria*-*Angelica sylvestris* fen, U17 *Luzula sylvatica*-*Geum rivale* tall herb community and CG10 *Festuca ovina*-*Agrostis capillaris*-*Thymus polytrichus* grassland. Within each of these, some examples contain *Crepis paludosa* and/or *Trollius europaea* but are otherwise similar in flora, habitat and ecology to the remainder of the NVC community in question and not appearing to warrant separation at NVC community level.

*Molinia*-dominated vegetation containing *Valeriana dioica* and/or *Sanguisorba officinalis* as well as *Crepis paludosa* and/or *Trollius europaeus*

Of all Scottish vegetation that has been assigned to M26, this has the closest resemblance to the published description of this community. As with the vegetation discussed above it has a lot in common floristically with M25c. However, the presence of *Valeriana dioica* and/or *Sanguisorba officinalis* means that it is much more restricted geographically because these two species are very rare N and W of the Borders and the eastern part of Dumfries & Galloway, and are unrecorded in the Highlands apart from a single record of *V. dioica* in the Glen Finglas area. This kind of vegetation does occur in Scotland (e.g. at a wetland site in the Borders), and while new sites may be found in future within the very restricted (south-eastern) Scottish range of *V. dioica* and *S. officinalis*, this type of vegetation is evidently rare this far north in Britain.

If M26 is defined this way, British herb-rich *Molinia* vegetation on neutral to slightly base-enriched soils can be understood quite clearly as comprising a main, widespread type and two regional variants, as follows:

- Herb-rich *Molinia* vegetation without *Valeriana dioica* and *Sanguisorba officinalis*. This (M25c) is widespread, occurring from SW England up to NW Scotland.
- Herb-rich *Molinia* vegetation with *Valeriana dioica* and/or *Sanguisorba officinalis* and including *Crepis paludosa* and/or *Trollius europaeus*. This (M26) is confined to a zone of overlap in the distributions of these two pairs of species: N Wales, N England and south-east Scotland.
- Herb-rich *Molinia* vegetation with *V. dioica* but no *Crepis paludosa* and/or *Trollius europaeus*, and including *Cirsium dissectum* and commonly *Juncus subnodulosus* too. This (M24) is widespread in southern Britain.

Molinia-dominated vegetation containing species indicative of base-enrichment: for example *Carex pulicaris*, *C. hostiana* and *Briza media*

The published description of M26 mentions that the habitat is subject to base-enrichment, as reflected by the presence of species such as *Carex pulicaris*, *C. hostiana* and *Briza media*. This has led some surveyors to assign *Molinia*-dominated vegetation to M26 where it includes a similar basiphilous element, especially if this is combined with the presence of *Crepis paludosa*. However, there is here a risk of confusion with vegetation transitional between M25c and the base-enriched M10 *Carex dioica*-*Pinguicula vulgaris* mire community, or with very fine-scale mosaics of M25c and M10. Assignment of such vegetation to M26 can represent a questionable approach to vegetation classification whereby a commonly occurring co-existence, as mosaics or intermediates, of two common communities is referred to a separate uncommon and geographically restricted third community.

*Juncus*-dominated vegetation containing one or more of *Crepis paludosa* and/or *Trollius europaeus*

In *Juncus acutiflorus* and *J. effusus* rush mires in upland Britain, scattered plants of *Crepis paludosa* are common and *Trollius europaeus* occurs very locally. Some of this vegetation has been classed as M26 because of the presence of these species, but the vegetation otherwise fits well into the M23 *Juncus effusus/acutiflorus*-*Galium palustre* rush-pasture NVC community without disrupting the floristic integrity of that community and without suggesting a clear difference in soils, climate or management. Although these species are not present in the M23 NVC table in the published NVC *Mires and heaths* volume, the M23 text mentions *Juncus acutiflorus* vegetation described by Birks in 1973 from Skye with *Crepis paludosa*, *Trollius europaeus* and *Cirsium heterophyllum*, which is regarded as a form of M23a (Rodwell, 1991). The occurrences of these species do not clearly appear to warrant separation from M23 at NVC community level, so a strong case can be made for retaining this vegetation within M23.

#### **APPENDIX 4. NOTE ON METHODS USED FOR DATA ANALYSIS**

The following is a summary of the procedure followed to organise and analyse the survey data. The method used may not be the most efficient, but is given for future reference, and perhaps improvement, for future similar work. In particular, a highly proficient GIS technician might be able to reduce the use of Excel spreadsheets by performing more steps within the GIS system, which might be quicker and/or more reliable, and use of hand-held computers such as those made by 'Trimble' could make SCM data handling more speedy.

SCM data for each assessed community was recorded in semi-automated and protected Microsoft Excel spreadsheets laid out similarly to standard paper SCM forms, but with editing restrictions for the surveyors inputting the data. Within each of these SCM spreadsheets, a second worksheet (not editable by the surveyors) collated the attribute data into a single column. This column of SCM attribute data was copied from each SCM spreadsheet into a single row in a master spreadsheet (using the transpose paste feature). In order to provide a connection to both the new area data in the digitised GIS dataset and the old area data in the SNH Lowland Grassland Database sample, a unique look-up reference was constructed for each row (i.e. for each community at each site) in the master spreadsheet, comprising the concatenated site reference number and NVC community.

Within the GIS, the attribute table for the digitised NVC polygon dataset was furnished with the following attributes (in addition to those provided by default, such as polygon area): site reference number; 8 NVC fields (SNH standard, for entering components of NVC mosaics); description (SNH standard, stating mosaic components and percentages in one text field); 8 NVC percentage fields, one for each NVC field (for recording percentage cover of each mosaic component); and 8 look-up reference fields, again one for each NVC field (comprising the concatenated site reference number and NVC mosaic component, in exactly the same way as for the SCM master spreadsheet in order to provide a connection for it).

To put the newly-surveyed area data in the SCM master spreadsheet, the GIS NVC attribute table was exported to an NVC area spreadsheet, and a column of look-up references was added in the same way as for the SCM master spreadsheet as described above. A pivot table was then used to construct lists of look-up references at each mosaic level (1 to 8), along with corresponding polygon areas and NVC percentage covers. These were combined into one continuous list, and NVC areas calculated using the polygon area and percentage cover fields. This list contained duplicate look-up references because each NVC community at a site commonly exists in more than one polygon, so, finally, another pivot table was used on this continuous list to provide a list of unique look-up references with summed NVC areas, giving the total area of each NVC community at each site. At this point, the 'vlookup' function in Excel was employed in the master spreadsheet to extract the area of each community at each site from the NVC area spreadsheet, using the look-up field as the common connection. A similar procedure was followed to extract old area data from the SNH Lowland Grassland Database, after the necessary additional step of reorganising the sample from the latter so it showed one community per row instead of one site with multiple communities per row, to match the SCM master spreadsheet.

Analysis of the SCM and area data in the SCM master spreadsheet data was then primarily undertaken using further pivot tables.

## APPENDIX 5. SITE CONDITION MONITORING FULL METHODOLOGY

### Introduction

This methodology uses standard field recording forms, which contain the attributes and generic targets to be assessed. There is a field form for each NVC grassland community. The forms are designed to hold your records from 20 samples (or 'stops') for each of the attributes below.

#### Sward Composition attributes

Positive indicator species  
Negative indicator species  
Grass:forb ratio (not used for acid grassland and mires)

#### Sward Structure attributes

Vegetation height  
Litter cover  
Bare ground

Positive indicator species are assessed by their frequency of occurrence. Grass:forb ratio and vegetation height are assessed by averaging the 20 records. Negative indicator species, litter cover and bare ground are assessed by estimating percentage cover once the whole site has been seen.

Before you can undertake the assessment you need to map the priority communities. You only need to map and sample priority communities, not sub-communities (you may add sub-community or non-priority information but only if this doesn't slow you down). If a priority community has several sub-communities or separate patches across the site, sample them as one stand by spreading the sample stops across them.

### Field methods

Choose the appropriate field recording forms for the NVC communities originally recorded on the site. *Note: the relevant NVC communities are shown on the blank maps and in the spreadsheet of sites. If the communities were assigned retrospectively, the old survey will describe the communities but not state the NVC type.*

Plan a W-shaped walk through the grassland that allows you to see the whole stand. Calculate the distance roughly so that you can stop at 20 sample points more or less evenly spaced along the way. Choose the actual sample points from a distance so that your choice is not influenced by the species present – once near the spot, walk 20 paces and centre the sample on the 20<sup>th</sup> step. *Note: this assumes that the community is not very small and that 20 samples are practical.*

At each stop, examine a sample area of 1 m<sup>2</sup> and record the presence of any of the positive and negative indicators listed on the field form.

Record the grass:forb ratio by estimating the percentage cover of forbs in the sward. Forbs are all non-grass herbs, including grass-like species such as sedges, rushes and woodrushes. This attribute is not used in Lowland dry acid grassland or Purple moor-grass and rush pasture, where sedges and rushes are frequent, making the estimate difficult.

Measure the vegetation height at the centre of the sample point, using a ruler. This is the height that the majority of leaves reach, excluding flowering heads, as shown below.



Record whether a litter layer is present in the sample. Some dead material is normally present in grassland so a litter layer is only recorded when material has accumulated over several seasons, creating a thick mat or thatch that blocks light and space at the base of the sward and prevents seedling regeneration.

Record whether any area of bare soil (not rock) over 5 cm<sup>2</sup> is visible without disturbing the vegetation.

Look out for the presence of negative indicators between sample points. Record any particularly notable features seen – these can be added to the site description.

## Completing the assessment

Count the number of occurrences of all positive indicators and use the DAFOR scale below to determine the frequency of each species. *Note: this is completed automatically in the Excel version of the form and need not be worked out in the field.*

|            |                                                             |
|------------|-------------------------------------------------------------|
| Rare       | no more than 20% cover (present in 1 - 4 samples out of 20) |
| Occasional | 21-40% cover (present in 5 - 8 samples out of 20)           |
| Frequent   | 41-60% cover (present in 9 - 12 samples out of 20)          |
| Abundant   | over 60% cover (present in 13 or more samples out of 20)    |
| Dominant   | abundant to the exclusion of other species                  |

At the end of the walk, estimate the percentage cover of the negative indicator species, litter mat and bare soil over the whole stand and indicate on the form if these are favourable or not. (according to the criteria on the form). Frequency of occurrence is not required for these attributes but it can be useful to refer to your records of occurrence in the 20 samples to help you make the estimate.

Calculate the average grass:forb ratio and vegetation height from the 20 samples. *Note: this is completed automatically in the Excel version of the form and need not be worked out in the field.*

Record the following at each site, whether or not the Priority grassland habitat is still present:

|                                          |                                                      |
|------------------------------------------|------------------------------------------------------|
| Site name                                | Surveyor/s initials                                  |
| Grid reference                           | Date                                                 |
| Stand reference no                       | Ownership or access details                          |
| Photo reference no. (to locate it later) | Adjacent land use (using the categories on the form) |
|                                          | Current management (in 'Notes' on the form)          |

Complete the summary of condition. Overall condition depends on the Sward Composition attributes but not the Sward Structure attributes, which may change rapidly in response to management. If any of the Sward Composition attributes is unfavourable, the overall condition of the stand is unfavourable. Otherwise overall condition is favourable. *Note: this is completed automatically in the Excel version of the form and need not be worked out in the field.*

Finally, take a photograph and write a brief pen picture of the site in the 'Notes' section of the form (one paragraph, normally about 200 words) noting topography, management, other types of vegetation present and any significant information not yet recorded. Where the originally mapped NVC community is no longer present, note the reasons why.

## Other important notes

You will be supplied with semi-automated versions of the assessment form in Excel format. The paper field versions match the digital ones. It is only necessary in the field to complete those parts of the paper forms that are shaded; the other parts complete themselves in the digital version as it is filled in. As soon as possible after the field survey (preferably immediately afterwards using a laptop in the car) you must transfer the data on the digital forms into a digital version. Do this by opening the relevant blank digital form, then immediately save it as *[site name][community]* with no spaces or punctuation, e.g.: 'KittocksDenMG5'. **Check the box for number of sample stops** near the top of the digital form – this is 20 by default, but if you have had reason to do less it must be changed to the number you did so the rest of the digital form works properly.

**Mark on the map where you took the photo** using a small circle with an arrow in the direction of the photo. Photographs must be re-named as *[site name]* on a computer as soon as possible, e.g.: 'KittocksDen'. *Make sure the camera date is set correctly.*

**Back up your completed digital forms and photographs** frequently, in case of hardware failure. A USB flash drive or memory stick is the easiest way of doing this.

Label communities and mosaic percentage covers on maps as usual, e.g.: U4/CG10 (75/25).

'Fair' or 'neat' maps are not required but **make sure field maps are legible** so that a digitiser can read them. Ideally, map initially in plain pencil, and then overwrite in clear ink (red if possible) when mapping is complete, to make it absolutely clear to the digitiser. You will be given two copies of each blank map, plus digital copies, in case a map is ruined by e.g. bad weather.

## **APPENDIX 6. BLANK ASSESSMENT RECORDING FORMS FOR EACH CONSTITUENT NVC COMMUNITY**

Note: there is no CG1 form. One stand of this community was found during this survey, and it has not previously been recorded in Scotland, thus no SCM recording form had been produced by SNH. The data for the CG1 stand was recorded using a CG2 form, which was later adjusted to accommodate the CG1 targets used by Hewins *et al* (2005).

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------------|----|
| Site Name                                                                               |                                                                                   |                               |                     |                   |                   |              |             | Surveyor(s)      |    |
| Grid Reference                                                                          |                                                                                   |                               |                     |                   |                   |              |             | Date             |    |
| Stand Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             | Ownership/Access |    |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             |                  | 20 |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall          |    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | incomplete        | incomplete        | incomplete   | incomplete  | incomplete       |    |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                           |           |             |                     |                   |               |  |  |  |
|---------------------------|-----------|-------------|---------------------|-------------------|---------------|--|--|--|
| Land-use adjacent to SITE |           |             |                     |                   |               |  |  |  |
| Mire/swamp/marshy grass   | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |  |  |  |
| Unimproved grass          | wood      |             |                     |                   |               |  |  |  |
| Semi-improved grass       | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |  |  |  |
| Improved grass            | wood      |             |                     |                   |               |  |  |  |
| Set-aside                 | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |  |  |  |
| Arable                    | wood      | water       |                     |                   |               |  |  |  |

|                                                                                                                    |                                                                           |                                                         |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------|
| Answer Qu.1 and either 2a, 2b or 2c                                                                                | 1. Is this community still present or a new record (yes, no, new record)? |                                                         |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)? |                                                                           |                                                         |
| If the area is less, state communities or other partly replacing it:                                               |                                                                           |                                                         |
| Is poor management evident (yes, no)?                                                                              |                                                                           | If yes, briefly state:                                  |
| 2b. If NO, is it lost, or in your opinion recorded in error?                                                       |                                                                           | If lost, was this natural succession or human activity? |
| Whether it is lost or an error, state communities or other replacing it:                                           |                                                                           |                                                         |
| If the community has been lost to human activity, briefly state:                                                   |                                                                           |                                                         |
| 2c. If NEW record, was it missed before or recorded wrongly?                                                       |                                                                           | If the latter, what was it called before?               |
| Is poor management evident (yes, no)?                                                                              |                                                                           | If yes, briefly state:                                  |

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no forbs, no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Grass to forb ratio:** Assess the percentage cover of forbs (non-grass species) at each stop. Average cover should be between 30% and 90%.

|                        |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    |     |
|------------------------|---|---|---|---|---|---|---|---|---|----|--------------------------|----|----|----|----|----|----|----|----|----|-----|
| stop                   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                       | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %                      |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    | 0   |
| FAVOURABLE: incomplete |   |   |   |   |   |   |   |   |   |    | UNFAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    |     |

**Vegetation height:** Measure the sward height at each stop. Average height should be between 2 and 20cm.

|                        |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    |     |
|------------------------|---|---|---|---|---|---|---|---|---|----|--------------------------|----|----|----|----|----|----|----|----|----|-----|
| stop                   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                       | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm                     |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    | 0   |
| FAVOURABLE: incomplete |   |   |   |   |   |   |   |   |   |    | UNFAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    |     |

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|                                        |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    |                          |  |  |  |  |  |  |  |  |  |
|----------------------------------------|---|---|---|---|---|---|---|---|---|----|------------------------|----|----|----|----|----|----|----|----|----|--------------------------|--|--|--|--|--|--|--|--|--|
| stop                                   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                     | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave                      |  |  |  |  |  |  |  |  |  |
| %                                      |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    | 0                        |  |  |  |  |  |  |  |  |  |
| Is litter cover over whole stand <25%? |   |   |   |   |   |   |   |   |   |    | FAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    | UNFAVOURABLE: incomplete |  |  |  |  |  |  |  |  |  |

**Bare ground:** Record presence of bare ground. Over the whole stand bare ground should be less than 5%.

|                                            |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    |                          |  |  |  |  |  |  |  |  |  |
|--------------------------------------------|---|---|---|---|---|---|---|---|---|----|------------------------|----|----|----|----|----|----|----|----|----|--------------------------|--|--|--|--|--|--|--|--|--|
| stop                                       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                     | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave                      |  |  |  |  |  |  |  |  |  |
| %                                          |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    | 0                        |  |  |  |  |  |  |  |  |  |
| Is bare ground cover over whole stand <5%? |   |   |   |   |   |   |   |   |   |    | FAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    | UNFAVOURABLE: incomplete |  |  |  |  |  |  |  |  |  |

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Anthyllis vulneraria</i>  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Briza media</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Carex</i> spp.            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Centaurea nigra</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Filipendula ulmaria</i>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Helianthemum nummul.</i>  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Linum catharticum</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus corniculatus</i>    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Polygala</i> spp.         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Pilosella officinarum</i> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Pimpinella saxifraga</i>  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Sanguisorba minor</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Thymus polytrichus</i>    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target: Are at least 4 species frequent & 3 occasional throughout sward?   
OR Are at least 4 species frequent & 3 locally abundant over >10% of sward?   
Reduced target: Are at least 3 species frequent & 3 occasional throughout sward?   
OR Are at least 3 species frequent & 3 locally abundant over >10% of sward?

|      |   |
|------|---|
| DAF= | 0 |
| O=   | 0 |

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. Is this condition favourable?                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. Is this condition favourable? |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. Is this condition favourable?   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5%. Is this condition favourable?                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

CG7

SNH Contract: 31137

Nominated officer: Jane Mackintosh

|                     |  |                  |  |
|---------------------|--|------------------|--|
| Site Name           |  | Surveyor(s)      |  |
| Grid Reference      |  | Date             |  |
| Stand Reference No. |  | Ownership/Access |  |
| Photo Reference No. |  |                  |  |

Add information to shaded boxes - don't change other boxes unless instructed otherwise.

|                          |                                                                                   |                               |                     |                   |                   |              |             |            |
|--------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------|
| Assessment of attributes | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             | 20         |
| Attribute                | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall    |
| Favourable? Y/N          | incomplete                                                                        | incomplete                    | incomplete          | incomplete        | incomplete        | incomplete   | incomplete  | incomplete |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT

WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                           |           |             |                     |                   |               |  |  |  |
|---------------------------|-----------|-------------|---------------------|-------------------|---------------|--|--|--|
| Land-use adjacent to SITE |           |             |                     |                   |               |  |  |  |
| Mire/swamp/marshy grass   | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |  |  |  |
| Unimproved grass          | wood      |             |                     |                   |               |  |  |  |
| Semi-improved grass       | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |  |  |  |
| Improved grass            | wood      |             |                     |                   |               |  |  |  |
| Set-aside                 | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |  |  |  |
| Arable                    | wood      |             |                     |                   |               |  |  |  |

**Answer Qu. 1 and either 2a, 2b or 2c**

1. Is this community still present or a new record (yes, no, new record)?

2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)?

If the area is less, state communities or other partly replacing it:

Is poor management evident (yes, no)? If yes, briefly state:

2b. If NO, is it lost, or in your opinion recorded in error? If lost, was this natural succession or human activity?

Whether it is lost or an error, state communities or other replacing it:

If the community has been lost to human activity, briefly state:

2c. If NEW record, was it missed before or recorded wrongly? If the latter, what was it called before?

Is poor management evident (yes, no)? If yes, briefly state:

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no forbs, no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Grass to forb ratio:** Assess the percentage cover of forbs (non-grass species) at each stop. Average cover should be between 30% and 90%.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete

UNFAVOURABLE: incomplete

**Vegetation height:** Measure the sward height at each stop. Average height should be between 2 and 20cm.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete

UNFAVOURABLE: incomplete

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand &lt;25%?

FAVOURABLE: incomplete

UNFAVOURABLE: incomplete

**Bare ground:** Record presence of bare ground. Over the whole stand bare ground should be less than 5%.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is bare ground cover over whole stand &lt;5%?

FAVOURABLE: incomplete

UNFAVOURABLE: incomplete

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|----------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| Aira spp.                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Aphanes spp.               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Astragalus danicus         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Campanula rotundifolia     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Carex spp.                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Centaureum erythraea       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Cladonia or Cetraria spp.  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Dianthus deltoides         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Erigeron acer              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Erodium cicutarium         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Fragaria vesca             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Galium saxatile            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Galium verum               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Helianthemum nummul.       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Leontodon spp.             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Lotus corniculatus         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Ornithopus perpusillus     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Pilosella officinarum      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Plantago coronopus         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Potentilla erecta          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Rumex acetosella           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Sedum acre                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Sedum anglicum             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Teesdalia nudicaulis       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Thymus polytrichus         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 2 species frequent & 4 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 4 locally abundant over >10% of sward? ☐

DAF= 0  
O= 0

Reduced target:

Are at least 1 species frequent & 3 occasional throughout sward? ☐ N

OR Are at least 1 species frequent & 3 locally abundant over >10% of sward? ☐

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                                                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. <b>Is this condition favourable?</b> <input type="checkbox"/>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| Anthriscus sylvestris                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Cirsium arvense                                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Cirsium vulgare                                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Equisetum arvense                                                                                                                                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Galium aparine                                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Rumex crispus                                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Rumex obtusifolius                                                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Senecio jacobaea                                                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Urtica dioica                                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. <b>Is this condition favourable?</b> <input type="checkbox"/> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| Lolium perenne                                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Phleum pratense                                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Trifolium repens                                                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Holcus lanatus                                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> Arrhenatherum and Dactylis together should cover no more than 10%. All species together should cover no more than 20%. <b>Is this condition favourable?</b> <input type="checkbox"/>                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| Arrhenatherum elatius                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Dactylis glomerata                                                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Phalaris arundinacea                                                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Deschampsia cespitosa                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Phragmites australis                                                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5% <b>Is this condition favourable?</b> <input type="checkbox"/>                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| Pteridium aquilinum                                                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |            |    |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------|----|
| Site Name                                                                               |                                                                                   |                               |                     |                   | Surveyor(s)       |              |             |            |    |
| Grid Reference                                                                          |                                                                                   |                               |                     |                   | Date              |              |             |            |    |
| Stand Reference No.                                                                     |                                                                                   |                               |                     |                   | Ownership/Access  |              |             |            |    |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |            |    |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |            |    |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             |            | 20 |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall    |    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | incomplete        | incomplete        | incomplete   | incomplete  | incomplete |    |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                           |           |             |                     |                   |               |  |  |  |
|---------------------------|-----------|-------------|---------------------|-------------------|---------------|--|--|--|
| Land-use adjacent to SITE |           |             |                     |                   |               |  |  |  |
| Mire/swamp/marshy grass   | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |  |  |  |
| Unimproved grass          | wood      |             |                     |                   |               |  |  |  |
| Semi-improved grass       | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |  |  |  |
| Improved grass            | wood      |             |                     |                   |               |  |  |  |
| Set-aside                 | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |  |  |  |
| Arable                    | wood      | water       |                     |                   |               |  |  |  |

|                                                                                                                    |                                                                           |  |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--|
| Answer Qu.1 and either 2a, 2b or 2c                                                                                | 1. Is this community still present or a new record (yes, no, new record)? |  |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)? |                                                                           |  |
| If the area is less, state communities or other partly replacing it:                                               |                                                                           |  |
| Is poor management evident (yes, no)?                                                                              | If yes, briefly state:                                                    |  |
| 2b. If NO, is it lost, or in your opinion recorded in error?                                                       | If lost, was this natural succession or human activity?                   |  |
| Whether it is lost or an error, state communities or other replacing it:                                           |                                                                           |  |
| If the community has been lost to human activity, briefly state:                                                   |                                                                           |  |
| 2c. If NEW record, was it missed before or recorded wrongly?                                                       | If the latter, what was it called before?                                 |  |
| Is poor management evident (yes, no)?                                                                              | If yes, briefly state:                                                    |  |

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no forbs, no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Grass to forb ratio:** Assess the percentage cover of forbs (non-grass species) at each stop. Average cover should be between 30% and 90%.

|                        |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    |     |
|------------------------|---|---|---|---|---|---|---|---|---|----|--------------------------|----|----|----|----|----|----|----|----|----|-----|
| stop                   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                       | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %                      |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    | 0   |
| FAVOURABLE: incomplete |   |   |   |   |   |   |   |   |   |    | UNFAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    |     |

**Vegetation height:** Measure the sward height at each stop. Average height should be between 2 and 15cm.

|                        |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    |     |
|------------------------|---|---|---|---|---|---|---|---|---|----|--------------------------|----|----|----|----|----|----|----|----|----|-----|
| stop                   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                       | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm                     |   |   |   |   |   |   |   |   |   |    |                          |    |    |    |    |    |    |    |    |    | 0   |
| FAVOURABLE: incomplete |   |   |   |   |   |   |   |   |   |    | UNFAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    |     |

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|                                        |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    |                          |  |  |  |  |  |  |  |  |  |
|----------------------------------------|---|---|---|---|---|---|---|---|---|----|------------------------|----|----|----|----|----|----|----|----|----|--------------------------|--|--|--|--|--|--|--|--|--|
| stop                                   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                     | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave                      |  |  |  |  |  |  |  |  |  |
| %                                      |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    | 0                        |  |  |  |  |  |  |  |  |  |
| Is litter cover over whole stand <25%? |   |   |   |   |   |   |   |   |   |    | FAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    | UNFAVOURABLE: incomplete |  |  |  |  |  |  |  |  |  |

**Bare ground:** Record presence of bare ground. Over the whole stand bare ground should be less than 5%.

|                                            |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    |                          |  |  |  |  |  |  |  |  |  |
|--------------------------------------------|---|---|---|---|---|---|---|---|---|----|------------------------|----|----|----|----|----|----|----|----|----|--------------------------|--|--|--|--|--|--|--|--|--|
| stop                                       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                     | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave                      |  |  |  |  |  |  |  |  |  |
| %                                          |   |   |   |   |   |   |   |   |   |    |                        |    |    |    |    |    |    |    |    |    | 0                        |  |  |  |  |  |  |  |  |  |
| Is bare ground cover over whole stand <5%? |   |   |   |   |   |   |   |   |   |    | FAVOURABLE: incomplete |    |    |    |    |    |    |    |    |    | UNFAVOURABLE: incomplete |  |  |  |  |  |  |  |  |  |

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|---------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Alchemilla</i> spp.          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Antennaria dioica</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Briza media</i>              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Campanula rotundifolia</i>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Small <i>Carex</i> spp.         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Euphrasia</i> spp.           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium boreale</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium verum</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Helianthemum nummul.</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Hypericum pulchrum</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Linum catharticum</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus corniculatus</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Pilosella officinarum</i>    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Polygala</i> spp.            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Persicaria vivipara</i>      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Potentilla erecta</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Selaginella selaginoides</i> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Thymus polytrichus</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Veronica officinalis</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Viola riviniana</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 2 species frequent & 4 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 4 locally abundant over >10% of sward? ☐

|      |   |
|------|---|
| DAF= | 0 |
| O=   | 0 |

Reduced target:

Are at least 1 species frequent & 3 occasional throughout sward? ☐ N

OR Are at least 1 species frequent & 3 locally abundant over >10% of sward? ☐

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                                                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. <b>Is this condition favourable?</b> <input type="checkbox"/>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. <b>Is this condition favourable?</b> <input type="checkbox"/> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. <b>Is this condition favourable?</b> <input type="checkbox"/>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5% <b>Is this condition favourable?</b> <input type="checkbox"/>                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

Nominated officer: **Jane Mackintosh**

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                                                                                                                                                     |  |                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------|
| <b>Answer Qu.1 and either 2a, 2b or 2c</b>                                                                                                          |  | 1. Is this community still present or a new record ( <u>yes</u> , <u>no</u> , new record)? |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same ( <u>more</u> , <u>less</u> , <u>same</u> , <u>ambiguous</u> )? |  |                                                                                            |
| If the area is less, state communities or other partly replacing it:                                                                                |  |                                                                                            |
| Is poor management evident ( <u>yes</u> , <u>no</u> )?                                                                                              |  | If yes, briefly state:                                                                     |
| 2b. If NO, is it <u>lost</u> , or in your opinion recorded in <u>error</u> ?                                                                        |  | If lost, was this <u>natural</u> succession or <u>human</u> activity?                      |
| Whether it is lost or an error, state communities or other replacing it:                                                                            |  |                                                                                            |
| If the community has been lost to human activity, briefly state:                                                                                    |  |                                                                                            |
| 2c. If NEW record, was it <u>m</u> issed before or recorded <u>w</u> rongly?                                                                        |  | If the latter, what was it called before?                                                  |
| Is poor management evident ( <u>yes</u> , <u>no</u> )?                                                                                              |  | If yes, briefly state:                                                                     |

**Notes** for whole site, including priority communities, management, expansion on above, notable spp., etc.

Costs for whole site, including pretest, communications, management, expansion on above, notations app, etc.

*If you find no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"*

| Bare ground:                                                        |   |   |   |   |   |   |                        |   |   |    |    |    |    |    |    |    |    |    |    |    |     |                          |  |  |  |
|---------------------------------------------------------------------|---|---|---|---|---|---|------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|--------------------------|--|--|--|
| Record presence of bare ground. Bare ground should be less than 10% |   |   |   |   |   |   |                        |   |   |    |    |    |    |    |    |    |    |    |    |    |     |                          |  |  |  |
| stop                                                                | 1 | 2 | 3 | 4 | 5 | 6 | 7                      | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |                          |  |  |  |
| %                                                                   |   |   |   |   |   |   |                        |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |                          |  |  |  |
| Is bare ground over whole stand <10%?                               |   |   |   |   |   |   | FAVOURABLE: incomplete |   |   |    |    |    |    |    |    |    |    |    |    |    |     | UNFAVOURABLE: incomplete |  |  |  |

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|----------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Achillea ptarmica</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Caltha palustris</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Carum verticillatum</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Filipendula ulmaria</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium palustre/uliginos.</i> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Hydrocotyle vulgaris</i>      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus pedunculatus</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lychnis flos-cuculi</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lythrum salicaria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Mentha aquatica</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Viola palustris</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 2 species frequent & 3 occasional throughout sward?

OR Are at least 2 species frequent & 3 locally abundant over >10% of sward?

|      |   |
|------|---|
| DAF= | 0 |
| O=   | 0 |

Reduced target:

Are at least 1 species frequent & 3 occasional throughout sward?

OR Are at least 1 species frequent & 3 locally abundant over >10% of sward?

**Juncus spp. assessment:** Record presence of *Juncus* spp. at each stop. They should cover 25-80% of whole stand.

|                                                        | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq                          |
|--------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-------------------------------|
| <i>Juncus</i> spp.                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -                             |
| Do <i>Juncus</i> spp. cover 25-80% of the whole stand? |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | <input type="text" value=""/> |

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                                              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. Is this condition favourable? <input type="text" value=""/>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. Is this condition favourable? <input type="text" value=""/> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. Is this condition favourable? <input type="text" value=""/>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5%. Is this condition favourable? <input type="text" value=""/>                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

**M24 + M25**

SNH Contract: 31137

Nominated officer: Jane Mackintosh

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |            |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------|
| Site Name                                                                               |                                                                                   |                               | Surveyor(s)         |                   |                   |              |             |            |
| Grid Reference                                                                          |                                                                                   |                               | Date                |                   |                   |              |             |            |
| Stand Reference No.                                                                     |                                                                                   |                               | Ownership/Access    |                   |                   |              |             |            |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |            |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |            |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   | 20           |             |            |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | N/A               | incomplete        | incomplete   | incomplete  | incomplete |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT

WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                                                                                                                      |           |             |                     |                   |               |  |  |  |
|----------------------------------------------------------------------------------------------------------------------|-----------|-------------|---------------------|-------------------|---------------|--|--|--|
| Land-use adjacent to SITE                                                                                            |           |             |                     |                   |               |  |  |  |
| Mire/swamp/marshy grass                                                                                              | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |  |  |  |
| Unimproved grass                                                                                                     | wood      |             |                     |                   |               |  |  |  |
| Semi-improved grass                                                                                                  | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |  |  |  |
| Improved grass                                                                                                       | wood      |             |                     |                   |               |  |  |  |
| Set-aside                                                                                                            | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |  |  |  |
| Arable                                                                                                               | wood      | water       |                     |                   |               |  |  |  |
| Answer Qu.1 and either 2a, 2b or 2c                                                                                  |           |             |                     |                   |               |  |  |  |
| 1. Is this community still present or a new record (yes, no, new record)?                                            |           |             |                     |                   |               |  |  |  |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)?   |           |             |                     |                   |               |  |  |  |
| If the area is less, state communities or other partly replacing it:                                                 |           |             |                     |                   |               |  |  |  |
| Is poor management evident (yes, no)? If yes, briefly state:                                                         |           |             |                     |                   |               |  |  |  |
| 2b. If NO, is it lost, or in your opinion recorded in error? If lost, was this natural succession or human activity? |           |             |                     |                   |               |  |  |  |
| Whether it is lost or an error, state communities or other replacing it:                                             |           |             |                     |                   |               |  |  |  |
| If the community has been lost to human activity, briefly state:                                                     |           |             |                     |                   |               |  |  |  |
| 2c. If NEW record, was it missed before or recorded wrongly? If the latter, what was it called before?               |           |             |                     |                   |               |  |  |  |
| Is poor management evident (yes, no)? If yes, briefly state:                                                         |           |             |                     |                   |               |  |  |  |

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

If you find no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Vegetation height:**

Measure the sward height at each stop. Average height should be between 5 and 80cm.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete

UNFAVOURABLE: incomplete

**Litter layer:**

Record presence of litter mat or thatch. Over the whole stand it should cover &lt;25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand &lt;25%?

FAVOURABLE: incomplete

UNFAVOURABLE: incomplete

**Bare ground:**

Record presence of bare ground. Bare ground should be less than 10%

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is bare ground over whole stand &lt;10%?

FAVOURABLE: incomplete

UNFAVOURABLE: incomplete

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Anagallis tenella</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Angelica sylvestris</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Small blue-green <i>Carex</i> spp. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Calluna vulgaris</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Carum verticillatum</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Centaurea nigra</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium dissectum</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Erica tetralix</i>              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Eupatorium cannabinum</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Filipendula ulmaria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium palustre/uliginos.</i>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus pedunculatus</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Mentha aquatica</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Narthecium ossifragum</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Pedicularis sylvatica</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Potentilla erecta</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Serratula tinctoria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Sphagnum</i> spp.               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Valeriana dioica</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Valeriana officinalis</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Viola palustris</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 2 species frequent & 3 occasional throughout sward?

N

DAF= 0

OR Are at least 2 species frequent & 3 locally abundant over >10% of sward?

O= 0

Reduced target:

Are at least 1 species frequent & 3 occasional throughout sward?

N

OR Are at least 1 species frequent & 3 locally abundant over >10% of sward?

**Molinia and Juncus spp. assessment:**

Record presence of *Molinia* and *Juncus* spp. at each stop.

|                         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|-------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Molinia caerulea</i> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Juncus</i> spp.      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

Do *Molinia* or *Juncus* cover 25-80% of the whole stand?

Is *Molinia* at least frequent over the stand?

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|-----------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| Agricultural weeds: these spp. should together cover no more than 5%. Is this condition favourable? |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

**Agriculturally favoured species:** these species should individually cover no more than 10% (20% for *H. lanatus*)

or together no more than 20%.

Is this condition favourable?

|                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
|-------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|
| <i>Lolium perenne</i>   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| <i>Phleum pratense</i>  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| <i>Trifolium repens</i> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| <i>Holcus lanatus</i>   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |

**Rank grasses:** *Arrhenatherum* and *Dactylis* together should cover no more than 10%. All species together should

cover no more than 20%.

Is this condition favourable?

|                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
|------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|
| <i>Arrhenatherum elatius</i> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| <i>Dactylis glomerata</i>    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| <i>Phalaris arundinacea</i>  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| <i>Deschampsia cespitosa</i> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| <i>Phragmites australis</i>  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |

**Woody spp. and bracken:** together these should cover no more than 5%

Is this condition favourable?

|                            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
|----------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|
| <i>Pteridium aquilinum</i> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |
| Scrub and trees            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |             |    |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|-------------|----|
| Site Name                                                                               |                                                                                   |                               |                     |                   |                   |              |             | Surveyor(s) |    |
| Grid Reference                                                                          |                                                                                   |                               |                     |                   |                   |              |             | Date        |    |
| Stand Reference No.                                                                     |                                                                                   |                               |                     | Ownership/Access  |                   |              |             |             |    |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |             |    |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |             |    |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             |             | 20 |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall     |    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | N/A               | incomplete        | incomplete   | incomplete  | incomplete  |    |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

| Land-use adjacent to SITE |           |        |            |               |          |  |  |  |
|---------------------------|-----------|--------|------------|---------------|----------|--|--|--|
| Mire/swamp/marshy grass   | Deciduous | Scrub/ | Parkland   | Golf          | Quarry   |  |  |  |
| Unimproved grass          | wood      | carr   |            |               |          |  |  |  |
| Semi-improved grass       | Conif     | Heath  | Gardens/   | House/farm/   | Tip/     |  |  |  |
| Improved grass            | wood      |        | allotments | urban         | industry |  |  |  |
| Set-aside                 | Mixed     | Fresh  | Maritime/  | Road/ railway | Unknown  |  |  |  |
| Arable                    | wood      | water  | coastal    |               |          |  |  |  |

|                                                                                                                    |  |                                                                           |  |
|--------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|
| <b>Answer Qu.1 and either 2a, 2b or 2c</b>                                                                         |  | 1. Is this community still present or a new record (yes, no, new record)? |  |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)? |  |                                                                           |  |
| If the area is less, state communities or other partly replacing it:                                               |  |                                                                           |  |
| Is poor management evident (yes, no)?                                                                              |  | If yes, briefly state:                                                    |  |
| 2b. If NO, is it lost, or in your opinion recorded in error?                                                       |  | If lost, was this natural succession or human activity?                   |  |
| Whether it is lost or an error, state communities or other replacing it:                                           |  |                                                                           |  |
| If the community has been lost to human activity, briefly state:                                                   |  |                                                                           |  |
| 2c. If NEW record, was it missed before or recorded wrongly?                                                       |  | If the latter, what was it called before?                                 |  |
| Is poor management evident (yes, no)?                                                                              |  | If yes, briefly state:                                                    |  |

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

If you find no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Vegetation height:** Measure the sward height at each stop. Average height should be between 5 and 80cm.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand <25%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Bare ground:** Record presence of bare ground. Bare ground should be less than 10%

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is bare ground over whole stand <10%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Angelica sylvestris</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Caltha palustris</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Small blue-green <i>Carex</i> spp. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Centaurea nigra</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Crepis paludosa</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Filipendula ulmaria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium palustre</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Geum rivale</i>                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lathyrus pratensis</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lychnis flos-cuculi</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Potentilla erecta</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Sanguisorba officinalis</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Serratula tinctoria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trollius europaeus</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Valeriana dioica</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 2 species frequent & 4 occasional throughout sward? ☐ N  
OR Are at least 2 species frequent & 4 locally abundant over >10% of sward? ☐

DAF= 0  
O= 0

Reduced target:

Are at least 1 species frequent & 3 occasional throughout sward? ☐ N  
OR Are at least 1 species frequent & 3 locally abundant over >10% of sward? ☐

**Molinia and Juncus spp. assessment:** Record presence of *Molinia* and *Juncus* spp. at each stop.

|                                                                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11                                                  | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq                     |
|---------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|-----------------------------------------------------|----|----|----|----|----|----|----|----|----|--------------------------|
| <i>Molinia caerulea</i>                                             |   |   |   |   |   |   |   |   |   |    |                                                     |    |    |    |    |    |    |    |    |    | -                        |
| <i>Juncus</i> spp.                                                  |   |   |   |   |   |   |   |   |   |    |                                                     |    |    |    |    |    |    |    |    |    | -                        |
| Do <i>Molinia</i> or <i>Juncus</i> cover 25-80% of the whole stand? |   |   |   |   |   |   |   |   |   |    | Is <i>Molinia</i> at least frequent over the stand? |    |    |    |    |    |    |    |    |    | <input type="checkbox"/> |

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                                         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. Is this condition favourable? <input type="checkbox"/>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. Is this condition favourable? <input type="checkbox"/> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. Is this condition favourable? <input type="checkbox"/>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5%. Is this condition favourable? <input type="checkbox"/>                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

# MG3

SNH Contract: 31137

Nominated officer: Jane Mackintosh

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------------|----|
| Site Name                                                                               |                                                                                   |                               |                     |                   |                   |              |             | Surveyor(s)      |    |
| Grid Reference                                                                          |                                                                                   |                               |                     |                   |                   |              |             | Date             |    |
| Stand Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             | Ownership/Access |    |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             |                  | 20 |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall          |    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | incomplete        | incomplete        | incomplete   | incomplete  | incomplete       |    |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                           |           |             |                     |                   |               |  |  |  |
|---------------------------|-----------|-------------|---------------------|-------------------|---------------|--|--|--|
| Land-use adjacent to SITE |           |             |                     |                   |               |  |  |  |
| Mire/swamp/marshy grass   | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |  |  |  |
| Unimproved grass          | wood      |             |                     |                   |               |  |  |  |
| Semi-improved grass       | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |  |  |  |
| Improved grass            | wood      |             |                     |                   |               |  |  |  |
| Set-aside                 | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |  |  |  |
| Arable                    | wood      | water       |                     |                   |               |  |  |  |

|                                                                                                                    |                                                                           |  |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--|
| Answer Qu.1 and either 2a, 2b or 2c                                                                                | 1. Is this community still present or a new record (yes, no, new record)? |  |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)? |                                                                           |  |
| If the area is less, state communities or other partly replacing it:                                               |                                                                           |  |
| Is poor management evident (yes, no)?                                                                              | If yes, briefly state:                                                    |  |
| 2b. If NO, is it lost, or in your opinion recorded in error?                                                       | If lost, was this natural succession or human activity?                   |  |
| Whether it is lost or an error, state communities or other replacing it:                                           |                                                                           |  |
| If the community has been lost to human activity, briefly state:                                                   |                                                                           |  |
| 2c. If NEW record, was it missed before or recorded wrongly?                                                       | If the latter, what was it called before?                                 |  |
| Is poor management evident (yes, no)?                                                                              | If yes, briefly state:                                                    |  |

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no forbs, no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Grass to forb ratio:** Assess the percentage cover of forbs (non-grass species) at each stop. Average cover should be between 40% and 90%.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Vegetation height:** Measure the sward height at each stop. Average height should be between 5 and 20cm (unless the stand is managed for hay or silage, in which case the upper height target does not apply).

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is this site managed for hay/silage? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand <25%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Bare ground:** Record presence of bare ground. Over the whole stand bare ground should be less than 5%.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is bare ground cover over whole stand <5%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Alchemilla</i> spp.             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Anemone nemorosa</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Briza media</i>                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Small blue-green <i>Carex</i> spp. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Centaurea nigra</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium heterophyllum</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Conopodium majus</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Euphrasia</i> spp.              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Filipendula ulmaria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Geranium sylvaticum</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Geum rivale</i>                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lathyrus pratensis</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Leontodon</i> spp.              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus corniculatus</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Persicaria bistorta</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rhinanthus minor</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Sanguisorba officinalis</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trollius europaeus</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 3 species frequent & 3 occasional throughout sward? ☐ N

OR Are at least 3 species frequent & 3 locally abundant over >10% of sward? ☐

|      |   |
|------|---|
| DAF= | 0 |
| O=   | 0 |

Reduced target:

Are at least 2 species frequent & 2 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 2 locally abundant over >10% of sward? ☐

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                                                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. <b>Is this condition favourable?</b> <input type="checkbox"/>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. <b>Is this condition favourable?</b> <input type="checkbox"/> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. <b>Is this condition favourable?</b> <input type="checkbox"/>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5% <b>Is this condition favourable?</b> <input type="checkbox"/>                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

**MG5**

SNH Contract: 31137

Nominated officer: Jane Mackintosh

|                     |  |                  |  |
|---------------------|--|------------------|--|
| Site Name           |  | Surveyor(s)      |  |
| Grid Reference      |  | Date             |  |
| Stand Reference No. |  | Ownership/Access |  |
| Photo Reference No. |  |                  |  |

Add information to shaded boxes - don't change other boxes unless instructed otherwise.

|                          |                                                                                   |                               |                     |                   |                   |              |             |            |
|--------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------|
| Assessment of attributes | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             | 20         |
| Attribute                | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall    |
| Favourable? Y/N          | incomplete                                                                        | incomplete                    | incomplete          | incomplete        | incomplete        | incomplete   | incomplete  | incomplete |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT

WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                           |           |             |                     |                   |               |  |  |  |
|---------------------------|-----------|-------------|---------------------|-------------------|---------------|--|--|--|
| Land-use adjacent to SITE |           |             |                     |                   |               |  |  |  |
| Mire/swamp/marshy grass   | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |  |  |  |
| Unimproved grass          | wood      |             |                     |                   |               |  |  |  |
| Semi-improved grass       | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |  |  |  |
| Improved grass            | wood      |             |                     |                   |               |  |  |  |
| Set-aside                 | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |  |  |  |
| Arable                    | wood      | water       |                     |                   |               |  |  |  |

**Answer Qu.1 and either 2a, 2b or 2c**

1. Is this community still present or a new record (yes, no, new record)?

2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)?

If the area is less, state communities or other partly replacing it:

Is poor management evident (yes, no)? If yes, briefly state:

2b. If NO, is it lost, or in your opinion recorded in error? If lost, was this natural succession or human activity?

Whether it is lost or an error, state communities or other replacing it:

If the community has been lost to human activity, briefly state:

2c. If NEW record, was it missed before or recorded wrongly? If the latter, what was it called before?

Is poor management evident (yes, no)? If yes, briefly state:

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no forbs, no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Grass to forb ratio:** Assess the percentage cover of forbs (non-grass species) at each stop. Average cover should be between 40% and 90%.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Vegetation height:** Measure the sward height at each stop. Average height should be between 5 and 20cm (unless the stand is managed for hay or silage, in which case the upper height target does not apply).

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is this site managed for hay/silage? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand <25%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Bare ground:** Record presence of bare ground. Over the whole stand bare ground should be less than 5%.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is bare ground cover over whole stand <5%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Agrimonia eupatoria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Alchemilla</i> spp.             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Anemone nemorosa</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Small blue-green <i>Carex</i> spp. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Centaurea nigra</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Filipendula ulmaria</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium verum</i>                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Genista tinctoria</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Hypochaeris radicata</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lathyrus linifolius</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lathyrus pratensis</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Leontodon</i> spp.              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Leucanthemum vulgare</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus corniculatus</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Pimpinella saxifraga</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Polygala</i> spp.               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Potentilla erecta</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Primula veris</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rhinanthus minor</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Sanguisorba minor</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Sanguisorba officinalis</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Silene silaus</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Stachys officinalis</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 2 species frequent & 4 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 4 locally abundant over >10% of sward? ☐

DAF= 0  
O= 0

Reduced target:

Are at least 2 species frequent & 2 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 2 locally abundant over >10% of sward? ☐

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                                         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. Is this condition favourable? <input type="checkbox"/>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. Is this condition favourable? <input type="checkbox"/> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                                              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. Is this condition favourable? <input type="checkbox"/>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5%. Is this condition favourable? <input type="checkbox"/>                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

# MG8

SNH Contract: 31137

Nominated officer: Jane Mackintosh

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------------|----|
| Site Name                                                                               |                                                                                   |                               |                     |                   |                   |              |             | Surveyor(s)      |    |
| Grid Reference                                                                          |                                                                                   |                               |                     |                   |                   |              |             | Date             |    |
| Stand Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             | Ownership/Access |    |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             |                  | 20 |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall          |    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | incomplete        | incomplete        | incomplete   | incomplete  | incomplete       |    |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                           |           |             |                     |                   |               |
|---------------------------|-----------|-------------|---------------------|-------------------|---------------|
| Land-use adjacent to SITE | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |
| Mire/swamp/marshy grass   | wood      |             |                     |                   |               |
| Unimproved grass          | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |
| Semi-improved grass       | wood      |             |                     |                   |               |
| Improved grass            | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |
| Set-aside                 | wood      | water       |                     |                   |               |
| Arable                    |           |             |                     |                   |               |

|                                                                                                                    |                                                                           |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Answer Qu.1 and either 2a, 2b or 2c                                                                                | 1. Is this community still present or a new record (yes, no, new record)? |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)? |                                                                           |
| If the area is less, state communities or other partly replacing it:                                               |                                                                           |
| Is poor management evident (yes, no)?                                                                              | If yes, briefly state:                                                    |
| 2b. If NO, is it lost, or in your opinion recorded in error?                                                       | If lost, was this natural succession or human activity?                   |
| Whether it is lost or an error, state communities or other replacing it:                                           |                                                                           |
| If the community has been lost to human activity, briefly state:                                                   |                                                                           |
| 2c. If NEW record, was it missed before or recorded wrongly?                                                       | If the latter, what was it called before?                                 |
| Is poor management evident (yes, no)?                                                                              | If yes, briefly state:                                                    |

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no forbs, no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Grass to forb ratio:** Assess the percentage cover of forbs (non-grass species) at each stop. Average cover should be between 40% and 90%.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Vegetation height:** Measure the sward height at each stop. Average height should be between 5 and 20cm (unless the stand is managed for hay or silage, in which case the upper height target does not apply).

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is this site managed for hay/silage? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand <25%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Bare ground:** Record presence of bare ground. Bare ground should be less than 10%

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is bare ground cover over whole stand <10%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|----------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Caltha palustris</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium dissectum</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Eupatorium cannabinum</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Filipendula ulmaria</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium palustre/uliginos.</i> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Geum rivale</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Hydrocotyle vulgaris</i>      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus pedunculatus</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lychnis flos-cuculi</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Mentha aquatica</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Potentilla palustris</i>      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Ranunculus flammula</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Thalictrum flavum</i>         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Valeriana dioica</i>          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Viola palustris</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

CSM target:

Are at least 2 species frequent & 4 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 4 locally abundant over >10% of sward? ☐

|      |   |
|------|---|
| DAF= | 0 |
| O=   | 0 |

Reduced target:

Are at least 1 species frequent & 3 occasional throughout sward? ☐ N

OR Are at least 1 species frequent & 3 locally abundant over >10% of sward? ☐

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. <b>Is this condition favourable?</b>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. <b>Is this condition favourable?</b> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. <b>Is this condition favourable?</b>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5% <b>Is this condition favourable?</b>                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

**U1**

SNH Contract: **31137**

Nominated officer: **Jane Mackintosh**

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------------|----|
| Site Name                                                                               |                                                                                   |                               |                     |                   |                   |              |             | Surveyor(s)      |    |
| Grid Reference                                                                          |                                                                                   |                               |                     |                   |                   |              |             | Date             |    |
| Stand Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             | Ownership/Access |    |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |                  |    |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             |                  | 20 |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall          |    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | N/A               | incomplete        | incomplete   | incomplete  | incomplete       |    |

**RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS**

|                           |           |             |                     |                   |               |
|---------------------------|-----------|-------------|---------------------|-------------------|---------------|
| Land-use adjacent to SITE | Deciduous | Scrub/ carr | Parkland            | Golf              | Quarry        |
| Mire/swamp/marshy grass   | wood      |             |                     |                   |               |
| Unimproved grass          | Conif     | Heath       | Gardens/ allotments | House/farm/ urban | Tip/ industry |
| Semi-improved grass       | wood      |             |                     |                   |               |
| Improved grass            | Mixed     | Fresh       | Maritime/ coastal   | Road/ railway     | Unknown       |
| Set-aside                 | wood      | water       |                     |                   |               |
| Arable                    |           |             |                     |                   |               |

**Answer Qu.1 and either 2a, 2b or 2c**

1. Is this community still present or a new record (yes, no, new record)?

2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)?

If the area is less, state communities or other partly replacing it:

Is poor management evident (yes, no)? If yes, briefly state:

2b. If NO, is it lost, or in your opinion recorded in error? If lost, was this natural succession or human activity?

Whether it is lost or an error, state communities or other replacing it:

If the community has been lost to human activity, briefly state:

2c. If NEW record, was it missed before or recorded wrongly? If the latter, what was it called before?

Is poor management evident (yes, no)? If yes, briefly state:

**Notes** for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no forbs, no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Vegetation height:** Measure the sward height at each stop. Average height should be between 1 and 10cm.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Litter layer:** Record presence of litter mat or thatch. Over the whole stand it should cover <25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand <25%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Bare ground:** Record presence of bare ground. Over the whole stand bare ground should be at least 5% and less than 25%, and in patches smaller than 20x20cm.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Are there bare patches bigger than 20x20cm? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

Is bare ground over whole stand 5 to 25%?

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|-----------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Aira</i> spp.                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Aphanes</i> spp.                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Astragalus danicus</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Campanula rotundifolia</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Centaurium erythraea</i>             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Cladonia</i> or <i>Cetraria</i> spp. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Erodium cicutarium</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Galium saxatile</i>                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Galium verum</i>                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lotus corniculatus</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Ornithopus perpusillus</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pilosella officinarum</i>            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Plantago coronopus</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Potentilla erecta</i>                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Rumex acetosella</i>                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Sedum acre</i>                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Sedum anglicum</i>                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Thymus polytrichus</i>               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |

CSM target:

Are at least 2 species frequent & 2 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 2 locally abundant over >10% of sward? ☐

|      |   |
|------|---|
| DAF= | 0 |
| O=   | 0 |

Reduced target:

Are at least 1 species frequent & 2 occasional throughout sward? ☐ N

OR Are at least 1 species frequent & 2 locally abundant over >10% of sward? ☐

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. <b>Is this condition favourable?</b>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Cirsium arvense</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Cirsium vulgare</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Equisetum arvense</i>                                                                                                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Galium aparine</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Rumex crispus</i>                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Rumex obtusifolius</i>                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Senecio jacobaea</i>                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Urtica dioica</i>                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. <b>Is this condition favourable?</b> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Phleum pratense</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Trifolium repens</i>                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Holcus lanatus</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. <b>Is this condition favourable?</b>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Dactylis glomerata</i>                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Phalaris arundinacea</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Phragmites australis</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5%. <b>Is this condition favourable?</b>                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| Scrub and trees                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

U4

SNH Contract: 31137

Nominated officer: Jane Mackintosh

|                                                                                         |                                                                                   |                               |                     |                   |                   |              |             |            |    |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------|---------------------|-------------------|-------------------|--------------|-------------|------------|----|
| Site Name                                                                               |                                                                                   |                               |                     |                   | Surveyor(s)       |              |             |            |    |
| Grid Reference                                                                          |                                                                                   |                               |                     |                   | Date              |              |             |            |    |
| Stand Reference No.                                                                     |                                                                                   |                               |                     |                   | Ownership/Access  |              |             |            |    |
| Photo Reference No.                                                                     |                                                                                   |                               |                     |                   |                   |              |             |            |    |
| Add information to shaded boxes - don't change other boxes unless instructed otherwise. |                                                                                   |                               |                     |                   |                   |              |             |            |    |
| Assessment of attributes                                                                | Enter no. of sample points (stops) taken (must be 20 unless community too small): |                               |                     |                   |                   |              |             |            | 20 |
| Attribute                                                                               | Positive indicators (CSM)                                                         | Positive indicators (reduced) | Negative indicators | Grass: forb ratio | Vegetation height | Litter layer | Bare ground | Overall    |    |
| Favourable? Y/N                                                                         | incomplete                                                                        | incomplete                    | incomplete          | N/A               | incomplete        | incomplete   | incomplete  | incomplete |    |

RED BOXES CALCULATE THEMSELVES - DON'T CHANGE THEM EXCEPT

WHEN 'A' OR 'D' IS REQUIRED IN THE INDICATOR SPECIES FREQUENCY COLUMNS

|                           |           |  |             |  |                     |  |                   |  |               |  |
|---------------------------|-----------|--|-------------|--|---------------------|--|-------------------|--|---------------|--|
| Land-use adjacent to SITE |           |  |             |  |                     |  |                   |  |               |  |
| Mire/swamp/marshy grass   | Deciduous |  | Scrub/ carr |  | Parkland            |  | Golf              |  | Quarry        |  |
| Unimproved grass          | wood      |  |             |  |                     |  |                   |  |               |  |
| Semi-improved grass       | Conif     |  | Heath       |  | Gardens/ allotments |  | House/farm/ urban |  | Tip/ industry |  |
| Improved grass            | wood      |  |             |  |                     |  |                   |  |               |  |
| Set-aside                 | Mixed     |  | Fresh water |  | Maritime/ coastal   |  | Road/ railway     |  | Unknown       |  |
| Arable                    | wood      |  |             |  |                     |  |                   |  |               |  |

|                                                                                                                    |  |                                                                           |  |
|--------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|
| Answer Qu.1 and either 2a, 2b or 2c                                                                                |  | 1. Is this community still present or a new record (yes, no, new record)? |  |
| 2a. If YES, in your opinion has the area changed, or probably stayed about the same (more, less, same, ambiguous)? |  |                                                                           |  |
| If the area is less, state communities or other partly replacing it:                                               |  |                                                                           |  |
| Is poor management evident (yes, no)?                                                                              |  | If yes, briefly state:                                                    |  |
| 2b. If NO, is it lost, or in your opinion recorded in error?                                                       |  | If lost, was this natural succession or human activity?                   |  |
| Whether it is lost or an error, state communities or other replacing it:                                           |  |                                                                           |  |
| If the community has been lost to human activity, briefly state:                                                   |  |                                                                           |  |
| 2c. If NEW record, was it missed before or recorded wrongly?                                                       |  | If the latter, what was it called before?                                 |  |
| Is poor management evident (yes, no)?                                                                              |  | If yes, briefly state:                                                    |  |

Notes for whole site, including priority communities, management, expansion on above, notable spp., etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

If you find no vegetation, no litter or no bare ground at a stop then don't leave a blank but enter a "0"

**Vegetation height:** (Excluding *Pteridium aquilinum*) Measure the sward height at each stop. Average height should be between 3 and 20cm.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| cm   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Litter layer:**

Record presence of litter mat or thatch. Over the whole stand it should cover &lt;25% of the sward.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Is litter cover over whole stand <25%? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

**Bare ground:**

Record presence of bare ground. Over the whole stand bare ground should be less than 10%, and in patches smaller than 20x20cm.

|      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|
| stop | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | ave |
| %    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 0   |

Are there bare patches bigger than 20x20cm? FAVOURABLE: incomplete UNFAVOURABLE: incomplete

Is bare ground over whole stand <10%?

**Positive indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. DAFOR frequency is calculated automatically except for 'Abundant' and 'Dominant' (insert 'A' or 'D')\*:

| Positive indicator species    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|-------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <i>Anemone nemorosa</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| † <i>Calluna vulgaris</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Campanula rotundifolia</i> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| † <i>Erica</i> spp.           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium saxatile</i>        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium verum</i>           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Genista tinctoria</i>      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lathyrus linifolius</i>    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Lotus corniculatus</i>     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Orchidaceae spp.              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Pedicularis sylvatica</i>  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Pilosella officinarum</i>  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Polygala</i> spp.          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Potentilla erecta</i>      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex acetosella</i>       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Serratula tinctoria</i>    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Stachys officinalis</i>    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Succisa pratensis</i>      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| † <i>Vaccinium myrtillus</i>  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Veronica officinalis</i>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Viola</i> spp.             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

† Ericaceous species should normally cover less than 25%, otherwise the vegetation is heathland.

**CSM target:**

Are at least 2 species frequent & 2 occasional throughout sward? ☐ N

OR Are at least 2 species frequent & 2 locally abundant over >10% of sward? ☐

DAF= 0  
O= 0

**Reduced target:**

Are at least 1 species frequent & 2 occasional throughout sward? ☐ N

OR Are at least 1 species frequent & 2 locally abundant over >10% of sward? ☐

**Negative indicator species:** Record presence of the following species at 20 stops distributed evenly throughout the stand. At the end of the visit, estimate percentage cover of these species and groups of species.\*\*

| Negative indicator species                                                                                                                                                                       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | freq |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|------|
| <b>Agricultural weeds:</b> these spp. should together cover no more than 5%. <b>Is this condition favourable?</b>                                                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Anthriscus sylvestris</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium arvense</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Cirsium vulgare</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Equisetum arvense</i>                                                                                                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Galium aparine</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex crispus</i>                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Rumex obtusifolius</i>                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Senecio jacobaea</i>                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Urtica dioica</i>                                                                                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Agriculturally favoured species:</b> these species should individually cover no more than 10% (20% for <i>H. lanatus</i> ) or together no more than 20%. <b>Is this condition favourable?</b> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Lolium perenne</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phleum pratense</i>                                                                                                                                                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Trifolium repens</i>                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Holcus lanatus</i>                                                                                                                                                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Rank grasses:</b> <i>Arrhenatherum</i> and <i>Dactylis</i> together should cover no more than 10%. All species together should cover no more than 20%. <b>Is this condition favourable?</b>   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Arrhenatherum elatius</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Dactylis glomerata</i>                                                                                                                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phalaris arundinacea</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Deschampsia cespitosa</i>                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <i>Phragmites australis</i>                                                                                                                                                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| <b>Woody spp. and bracken:</b> together these should cover no more than 5%. <b>Is this condition favourable?</b>                                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| <i>Pteridium aquilinum</i>                                                                                                                                                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |
| Scrub and trees                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | -    |

\*DAFOR for 20 stops: R = 1-4 stops (<21%); O = 5-8 stops (21-40%); F = 9-12 stops (41-60%); A = 13+ stops (>60%); D = 13+ stops & excludes other spp.

\*\*Fill in the yes/no boxes for the four conditions. Can use the DAFOR frequencies (calculated automatically except for 'Abundant' and 'Dominant') as a guide.

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