The Habitats Directive in the UK: some wider questions raised by the definition, notification and monitoring of grassland habitats

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Abstract
In the UK there are 76 Annex I habitats, including 23 priority types, and a total of 613 SACs have been designated covering over 25,000 km² or 6.5% of the land surface. There is an interpretation manual which provides a modular description of the habitat, a summary of the vegetation types included using a standard phytosociological scheme for the country, information about environmental relationships, extent and the rationale for selecting sites. Using examples from a variety of UK grassland types of wider relevance across Europe, this paper examines the quality of definition of the habitats and the extent of their designation within Natura 2000. Details are also given of the UK monitoring programme and some difficulties of defining ‘favourable condition’ are reviewed.

Key words: Annex I, European Vegetation Survey, Favourable Condition, Habitats Directive, lowland grasslands, monitoring, phytosociology.

Résumé
La directive « Habitats » au Royaume-Uni: quelques questions générales soulevées par la définition, la notification et le monitorage des habitats des prairies. Au Royaume-Uni, il y a 76 habitats de la liste Annexe 1, y compris 23 types prioritaires, et 613 SIC ont été désignés au total, recouvrant plus de 25,000 km² ou 6.5% de la superficie du pays. Il existe un manuel interprétatif qui fournit : une description modulaire de chaque habitat ; un résumé des types de végétation inclus là-dedans, désignés par le moyen d’un outil de référence phytosociologique pour le pays ; des renseignements sur les relations environnementales ; ainsi que l’étendue de chacun et le motif de sélectionnement des sites. A l’aide d’exemples tirés d’une variété de types de prairie trouvés au Royaume-Uni qui ont une importance à l’échelle européenne, cet article examine la qualité de la définition des habitats et l’état de leur désignation dans le cadre du réseau Natura 2000. Il donne également les détails du programme de suivi au Royaume-Uni et examine quelques difficultés de définition de ‘condition favorable’.

Mots clés: Annexe I, Condition Favorable, directive Habitats, monitorage, phytosociologie, prairies de plaine, végétation européenne Survey.

The Habitats Directive in the UK

The UK lies entirely within the Atlantic biogeographic zone of the EU and has 76 of the Annex I habitats including 23 priority types. 51 Annex II species also occur there. Starting from December 2004, a total of 613 SACs has been designated across the UK, covering 25,109 km² or 6.5% of the terrestrial area of the nation. Most of the terrestrial or freshwater SACs are based on sites previously notified for their scientific interest and nature conservation value. Each of the UK countries (England, Scotland, Wales & Northern Ireland) now has a separate nature conservation agency and team of Habitats Directive advisors but, together with the coordinating Joint Nature Conservation Committee, these all report to central government on the implementation of the Habitats Directive.

There is a web-based interpretation manual for the Annex I habitats represented in the UK (www.jncc.gov.uk/page-1523). This provides a modular description of each of the Annex I habitats: a summary of the vegetation types which are included, the ecological characteristics such as relationships to climate, soil and biotic factors, the overall distribution, the rationale for selection of sites and brief accounts of the SACs designated. The UK has a comprehensive and standardised phytosociological classification of vegetation (Rodwell 1991 et seq.) which recognises 292 communities equivalent to Braun-Blanquet associations and a remedial survey of gaps in coverage has scoped a further 60 provisional plant communities (Rodwell et al., 2000). This scheme provides a basis for the interpretation and mapping of the Annex I habitats (Jackson & McLeod, 2002) but, in practice, the scientific precision of habitat definition varies considerably. This paper, based on research for Natural England (Rodwell et al., 2007), uses a variety of grassland types to highlight some difficulties in interpretation and understanding the Annex I habitats that are of wide relevance across Europe. For the first time, this project
also gives an overview of the representation of these different grasslands within the whole Natura 2000 network.

The varied definition of Annex I habitats across the EU

The Species and Habitats Interpretation Manual (CEC 2003) provides definitions of the Annex I habitats and many EU member states have interpretation manuals of their own, often with the kind of modular format used in the UK. Some manuals are published books, others are agency reports, others are web-based and a fuller review of these can be found in Rodwell et al. 2007. Where an authoritative phytosociological framework is used as the basis for definition comparisons of interpretation from country to country are more easily achieved. Of course, the character of particular habitats varies across Europe according to the local interactions of climate, soil and human impacts but, beyond this, there have often been arguments as to quite how the vegetation types they include are to be defined and classified.

In some cases, as with the 6520 Mountain hay meadows, the definition in the EU Interpretation Manual (CEC 2003) is clear and the interpretation across Europe has been more or less the same, so a good range of Triseto-Polygonion grasslands is now protected within the Natura 2000 network. By contrast, the habitat 6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) is defined as comprising ‘species-rich meadows on lightly to moderately fertilised soils of the plain to sub-montane levels, belonging to the Arrhenatherion and the Brachypodio-Centaureion nemoralis alliances’, this latter apparently a defunct name of which are scarce or rare in the country, some endemic. It has 29% of the SACs (Fig. 3), though these include localities on serpentine rocks where the vegetation is obviously of broader floristic affinities and sometimes dominated by cryptogams: in other words, in this case, the British interpretation has been rather generous. In particular, pioneer stages which are not considered a priority in the Habitats Directive have attracted particular attention in the UK (Simkin, 2003). They are especially rich in lichens and bryophytes, many of which are scarce or rare in the country, some endemic to the habitat. Such pioneer stages depend on the creation and maintenance of fresh substrate and the interruption of succession by, for example, river flooding. Taking the Habitats Directive definition literally neglects this important and interesting aspect of the habitat.

In other cases, it is differences of interpretation that
threaten sustaining the full dynamism of a habitat. The 6210 Semi-natural dry grasslands on calcareous substrates are referred in the Habitats Directive Interpretation Manual (CEC 2003) to the *Festuco-Brometalia* and the associated species list focuses on plants of the Bromion (= Mesobromion) and Xerobromion, though the fuller definition clearly includes two orders of the *Festuco-Brometea*, the *Brometalia* and the *Festucetalia vallesiacae*. In the UK, where there are up to 38,000ha of this habitat, a total of 8 plant communities and parts of 2 others have been included (Fig. 4) and across Europe there has generally been a similar generous approach to including equivalent associations within the definition. Over 2800 SACs have been designated (Fig. 5).

However, more problematic has been the interpretation of the part of the habitat definition which includes ‘scrubland facies’. It is the Dutch who have been most explicit in including within the definition transitions to woody vegetation that develop with the

Fig. 1 - Distribution of MG4 *Alopecurus-Sanguisorba* grassland, the 6510 Lowland hay meadow in the UK (solid circles within a 10x10km national grid) and the total range of other lowland hay meadows of the Arrhenatheretalia included in the Habitat Action Plan (HAP: open circles)
relaxation of the grazing essential for sustaining the grasslands themselves. In The Netherlands, this habitat therefore includes associations of calcicolous fringe vegetation of the *Trifolion medii* and *Berberidion* scrubs (Jansen & Schaminée, 2003). Transitions to scrub are also included as part of the habitat in Denmark (Pihl *et al*., 2001) and Lithuania (Rasomavičius *et al*., 2001) or they find mention in the literature as part of the mosaics and dynamic transitions as in France (Bensettiti *et al*., 2003) and Germany (Ssymank *et al*., 1998). In the UK, grassland-scrub transitions are of particular interest for certain rare and local plants and some SACs are especially significant in this respect but British examples of the Geranion (see Rodwell *et al*., 2000) could be more explicitly included within the definition. Of course, as throughout the range of this habitat, the inclusion of both grassland and scrub poses particular difficulties because of the need to carefully modulate the grazing so as to sustain dynamic mosaics.

**Using phytosociology to help define ‘Favourable condition’**

Such questions highlight the difficulty of understanding what is the ‘favourable condition’ of a

Fig. 2 - Distribution of SACs for 6510 Lowland hay meadows (NATURA 2000 data notified to the European Commission by EU Member States and supplied by the European Topic Centre on Biological Diversity, Paris)
particular habitat and what management might ensure this is delivered within the frame of the Habitats Directive. The 6520 Mountain hay meadows, for example, depend, in the UK as elsewhere in Europe, on traditional hay-making on moderately fertile soils in a harsh sub-montane climate (Fig. 6, Rodwell, 1992; Jefferson, 2005). With the unpredictable climate characteristic of the upland fringes, the actual dates of hay-making are very variable, the farmer being dependent upon four or five days of good sunny weather to cut and dry the crop. Agri-environment schemes in the UK, intended to help sustain this national resource within the frame of the habitats Directive and UK conservation designations, have often imposed fixed dates for starting the mowing, and have banned the application of lime and mild forms of phosphate which are known to have been essential in the past for maintaining both floristic richness and the productivity essential to sustain the farm animals. This formality of management is itself damaging to the sustainability and diversity of the resource and it undervalues the importance of seasonal impacts of climate and the ways in which farming culture accommodates to them from year to year.

Sometimes, too, in the UK, the phytosociological definition of a plant community in the literature is
wrongly used to rigidly define what should be the floristic profile and appearance of a particular habitat wherever it occurs. The constancy table of the \textit{Anthoxanthum-Geranium} hay meadow (MG3 in Rodwell, 1992), the British representative of habitat 6520, has sometimes been used as a prescriptive test of the condition of sites, whether they are worth designating and whether they are as they should be. In fact, of course, a phytosociological table is a generalised summary of a great deal of diversity and the aim of the Habitats Directive should be to sustain such locally distinctive site variation within the overall envelope of definition.

\textbf{Monitoring for the Habitats Directive in the UK}

SACs and other designated sites in the UK are all assessed using Common Standards Monitoring.
Fig. 5 - Distribution of SACs for 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (NATURA 2000 data notified to the European Commission by EU Member States and supplied by the European Topic Centre on Biological Diversity, Paris) which became operational in 1999 and the first results of which have recently been published (Williams, 2006). The basis for such monitoring is not the site itself but the particular features(s) - the species or habitat from the Habitats Directive Annexes - for which it was designated. Every SAC has a management plan or statement with conservation objectives for each feature. These identify attributes of the features and set targets against which measurements are made.

At the level of individual SACs, Common Standards Monitoring shows the degree to which the conservation measures are effective in achieving the objectives of the site designation. At national level, the programme enables the government to demonstrate its commitment to the Habitats Directive and identifies any shortfalls in implementation.
During the 1998 pilot year, it was clear that detailed guidance was needed in formulating conservation objectives and this was developed and progressively adopted over the next few years (www.jncc.gov.uk/page-2199 & 2201). It is intended that every SAC feature should be monitored over six years in a rolling programme. During the first six years, 1570 assessment reports were made for SACs which covers 71% of the total number of sites. Overall, 37% were found to be favourable, 24% unfavourable recovering, 38% unfavourable declining or no-change, and 1% destroyed in part or wholly. The comparable figures for the national Sites of Special Scientific Interest, where 57% of sites were monitored were 57%, 16%, 26% and 1%.

In addition, Common Standards Monitoring requires the identification of ‘Adverse Activities’ - those human activities damaging the feature - and ‘Management Measures’ which are beneficial in achieving favourable condition. These will help prioritise conservation effort and the use of resources in the future. Recording of adverse activities shows that the lack of appropriate remedial management is extremely common and the level of grazing on SACs is a very widespread cause for concern - very often it is too heavy, in many other situations too light. Invasive species, thoughtless forest or farming operations, poor water management, poor water quality and recreation impacts are the next most frequent adverse influences. Management agreements with site owners or occupiers are the most common method of trying to bring SACs into favourable condition. Agri-environment schemes may have a larger role to play in future though these have not been very successful so far.

The capture of the European resource within Natura 2000

Different habitats are very unevenly represented within the Natura 2000 network from country to
country (Tab. 1). This is partly because they are not uniformly distributed across Europe, of course, their range being naturally determined by climate and soil and, with grasslands, strongly influenced by patterns of human settlement and intervention. But the differing interpretation of the habitat definitions also accounts for some of these disparities, sometimes because of scientific arguments about just what the vegetation types are, or should be called, or how classified; sometimes because of political concerns about how much responsibility a particular country wishes to accept for the costly sustainability of the habitats.

How representative of the total European habitat resource the Natura 2000 network will be, is an interesting and difficult question. Recently the European Vegetation Survey has produced an overview of the vegetation of Europe at alliance level (Rodwell et al., 2002), probably the most feasible level at which to make such a summary. But we still do not have an accurate indication of the distribution and total extent of the vast majority of vegetation types and habitats across Europe even at this level: a study like that on the Cynosurion by Zuidhoff et al. (1997) shows how difficult a ‘bottom-up’ approach to defining and mapping just a single alliance can be. Preliminary responses to a questionnaire within the European Vegetation Survey can show crudely what is the extent of particular phytosociological alliances within different countries.

Tab. 1 - Percentage of SACs for each of selected Lowland Grassland habitats in each EU member state (AT Austria, BE Belgium, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, ES Spain, FI Finland, FR France, GR Greece, HU Hungary, IE Ireland, IT Italy, LT Lithuania, LU Luxembourg, LV Latvia, MT Malta, NL Netherlands, PL Poland, PT Portugal, SE Sweden, SI Slovenia, SK Slovakia, UK United Kingdom)

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as with the Alopecurion and Calthion shown in Fig. 7 and 8, but more detailed data in distribution are needed.

One further use of a phytosociological overview is that it is possible to identify vegetation types which are at present poorly covered within the Habitats Directive. Good examples of such neglected habitats are the weed communities of traditional arable land, with low inputs and traditional patterns of cropping. In the UK a number of such vegetation types have been characterised (Rodwell, 1991 et seq., Rodwell et al., 2000) but they are under continuing threat and traditional arable landscapes are very rare.

Fig. 7 - Extent of Alopecurion grasslands in selected European countries (blank=no data, 1=never recorded, 2=rare, 3=local, 4=widespread but uncommon, 5=widespread and common)

Fig. 8 - Extent of Calthion grasslands in selected European countries (blank=no data, 1=never recorded, 2=rare, 3=local, 4=widespread but uncommon, 5=widespread and common)
References


