

Interpreting the habitats of Annex I: past, present and future

by Doug Evans

*European Topic Centre on Biological Diversity, 57 rue Cuvier, F-75231 Paris cedex 05;
evans@mnhn.fr*

Abstract.- Annex I of the EU Habitats directive lists habitats which the member states must protect by the designation and management of protected areas known as Special Areas of Conservation. This list of habitats has grown from 170 in 1992 to 231 in 2007 due to enlargement of the EU from 12 to 27 members. An Interpretation Manual describes the habitats but there is often variation between member states in how they interpret the habitat types, sometimes there is variation between regions in the same country. Several examples of such differences are presented and the efforts to date to ensure similar interpretations are described. Finally some possible future developments are discussed.

Key words : Habitats directive - habitats - Natura 2000.

Résumé.- L'annexe I de la directive Habitat donne les habitats pour lesquels les états membres ont l'obligation de classer et gérer des zones protégées reconnues comme zone spéciales de conservation. La liste des habitats a augmenté, passant de 170 en 1992 à 231 en 2007 suite à l'élargissement de l'Union européenne. Un Manuel d'interprétation décrit les habitats, cependant on trouve des nombreuses variations d'interprétation entre les États membres et parfois entre deux régions d'un même pays. Quelques exemples et moyens utilisés pour avoir des interprétations cohérentes sont présentés. Enfin, l'évolution future est discutée.

Mots clés : directive Habitats - habitats - Natura 2000.

I. INTRODUCTION

The European Union's 1992 directive on Conservation of Natural Habitats and of Wild Fauna and Flora, more often known as the *Habitats directive*, obliges EU member states to propose « sites of Community importance » and, if approved, then designate them as « special areas of conservation » for habitats and species considered to be of community interest and listed in annexes I and II of the directive (CEC, 1992; Sundeth & Creed, 2008). Habitats of Community interest are defined as i) are in danger of disappearance in their natural range, or ii) have a small natural range following their regression or by reason of their intrinsically restricted area, or iii) present outstanding examples of typical characteristics of one or more of the nine following biogeographical regions: Alpine, Atlantic, Black Sea, Boreal, Continental, Macaronesian, Mediterranean, Pannonian and Steppic.

When the directive was adopted in 1992, annex I listed 170 habitat types and following enlargement of the EU to 27 member states this has now increased to 231. The habitats are mostly equivalent to a phytosociological alliance although some are more narrowly defined while others are landscape units rather than habitats (Evans, 2006).

II. EVOLUTION OF ANNEX I

The first draft of the Habitats directive was published in 1988 but did not include any of the annexes (CEC, 1988). In the draft directive the habitats to be protected by the designation of sites were in annex IV. In 1989 work to establish the lists of habitats to be protected started with a meeting of national experts on the 1st and 2nd August 1989 in Brussels. Prior to this meeting, Prof. Albert Noirfalise produced a draft list of habitats while Pierre Devillers produced a second list at the meeting. After comments from the member states and invited experts, draft annexes were published followed by a revision (CEC, 1991a, b).

The original list of habitats proposed by Prof. Noirfalise was based on the CORINE biotopes classification (Devillers *et al.*, 1991) and is not dissimilar to the list of habitats listed in the 1992 directive while the Devillers list, also derived from CORINE, was much shorter with fewer, more broadly defined habitats – for example the Devillers list included « matorals » whereas Noirfalise listed particular types of matorral he considered to need protecting.

Notable absences from the Noirfalise list, later added during negotiations between the member states and the European Commission, are reefs, estuaries, hay meadows, screes and cliffs whilst habitats proposed by Noirfalise but not chosen for annex I include several riverine and riparian habitats such as *Salicion triandro-viminalis* and *Phragmition australis* (CORINE codes 44.12 & 53.1).

The annex I of 1992 defined most habitats by giving the equivalent unit(s) in the CORINE biotopes classification which at the time was the only classification covering both marine and terrestrial habitats across all the E.U. These descriptions are brief but often give equivalent syntaxa linking the descriptions to the wider literature.

To aid site selection and common understanding an interpretation manual was produced by the European Commission in association with experts from the member states (EC, 2007). The first draft only covered habitats considered as « priority » (those indicated with an asterisk in annex I and subject to stricter protection than the remaining habitats) but the work was extended to all annex I habitats and a first edition was published in 1995. This

edition gave distribution (by country) and noted sub-types for many habitats. A second edition was produced in 1996 which introduced the 'Natura 2000 codes' and gave codes from both the CORINE and Palaeartic classifications (Devillers & Devillers-Terschuren, 1996). It also included new habitats from Austria, Finland and Sweden although the final list of additional habitats for the later two was not finalised until 1997 (CEC, 1997) and not fully included in the Interpretation Manual until a revision published in 1999, this edition (EUR15-2) omitted the CORINE codes. Further editions were produced in 2003 and 2007 to include habitats added due to enlargement of the European Union in 2004 and 2007. The descriptions of the new habitats were based on the Palaeartic classification, but amended where considered necessary by national experts and the ETC/BD. These editions did not include distribution by country. At each revision the opportunity was taken to correct earlier errors.

In many cases, additional habitats proposed by the new member states were close to existing habitats and the definition of the existing habitat was changed rather than adding a new habitat, for example several habitats occurring at higher altitudes in the Carpathians proposed as additional habitats in 2000 by Poland, Romania and Slovakia are very similar to habitats occurring in the Alps and in such cases the existing definition was amended and, if necessary, additional Palaeartic Classification codes. In some cases this change also concerned the former member states, as was the case for habitat « 4080 Sub-Arctic *Salix* sp. scrub », previously considered as only present in Scandinavia and Scotland but now to occur in the Alps, Carpathians and other mountain ranges. France and Italy had previously proposed sites for this habitat but the biogeographical seminar held in Gap, France in 1999 agreed that they did not conform to the original description. These sites have now been incorporated into Natura 2000.

III. INTERPRETING THE HABITATS

The descriptions given in the EU interpretation manual are mostly very short, only available in English (although the editions published in 1996 and 1999 were also available in French) and often have to cover a wide range of variation (some habitats occur in twenty or more member states) thus many member states, and sometimes regional administrations (e.g. in Italy and Germany), have produced their own handbooks. Some of these are aimed at the general public with colour illustrations but little detail, as in Latvia or Sweden (Kabucis, 2004; Löfroth, 1997) while others, for example Austria or France (Bensettiti, 2001-2005; Ellmauer & Traxler, 2000), are more technical and aimed at staff responsible for site selection and management. An alternative approach used by several countries is to give the correspondence between the habitats of annex I and a national classification of habitats as in the Czech Republic and Romania (Chytrý *et al.*, 2001; Donita *et al.*, 2005).

The majority of habitats can be linked to one or more syntaxa, either by their name (26%) or by their description (53%) and only 37% have no clear link to a syntaxa. Many of the habitats not linked to syntaxa are habitats added by Finland and Sweden when they joined the EU in 1995 (9%) which are often landscape units rather than plant communities. There are a few habitats where there is general agreement to have a broader interpretation than the name of the habitat would suggest. For example « 9130 *Asperulo-Fagetum* beech forests » is interpreted as including all the associations in the alliance *Asperulo-Fagion* which is the community noted in drafts of annex I and which corresponds to the CORINE code given in the 1992 annex.

Many habitats have names which combine a physical description, sometimes with a geographical element, with a syntaxon, for example « 4070 *Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsuti*) » or « 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) » and it appears that some countries give more importance to one or other component of the name. Habitats often occur beyond the biogeographical region noted in their name and as noted in the Interpretation Manual, such occurrences often have a particular value. However there are very few sites proposed for the habitats noted as Baltic, Boreal or Fennoscandian outside the Boreal biogeographical region and they are all in the Continental region of southern Sweden, although in many cases similar plant communities occur elsewhere. In some cases restrictions such as « Fennoscandian » were added to the names of these habitats at the insistence of existing member states when Finland and Sweden joined the E.U. in 1995, for example « 6270 *Fennoscandian lowland species-rich dry to mesic grasslands » where the United Kingdom asked for the geographical restriction to be added.

Some habitats, which were considered to be restricted to one or a few countries when the directive was adopted in 1992, are now considered to be present over a much wider range. For example « 8240 Limestone pavements » was originally thought to be present only in Ireland and the United Kingdom, together with Sweden when it joined the EU in 1995, but is now considered to be present in five other countries (Gaudillat, 2008).

Some annex I habitats are clearly subtypes of another habitat, for example « 3170 *Mediterranean temporary ponds » is a subtype of « 3120 Oligotrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with *Isoetes* spp. » while « 4040 *Dry Atlantic coastal heaths with *Erica vagans* » is clearly a subtype of « 4030 European dry heaths ». In these two examples the subtype is given priority status and stands which correspond to the definition of the priority subtype should be treated as the priority form. Unfortunately the standing freshwater habitats (codes starting with 31) are particularly complex with both priority subtypes and overlapping descriptions (Evans, 2006; Bagella *et al.*, 2007).

In most countries, the national habitat handbooks or guidance use a phytosociological framework and this helps make comparisons between the interpretations of one country with another. John Rodwell and colleagues have used this approach to compare the interpretations used in the United Kingdom with those of other countries for woodlands and lowland grasslands (Rodwell & Dring, 2001; Rodwell *et al.*, 2007).

The principal forum for discussing varying interpretations has been the series of biogeographical seminars organised by the European Commission with support from the ETC/BD to discuss the national proposals for SCI. The focus of these meetings is on the sufficiency or otherwise of the network to ensure the long-term survival of the habitats and species of annexes I and II but this often involves discussion of how to interpret the habitats. The Boreal region has probably made the largest effort to have consistent interpretations with regular meetings of experts, often organised by the Baltic Environment Forum with funding from the European Commission to discuss the implementation of the Habitats Directive. More recently there have been meetings held at Erken in 2008 and Persåsen in 2009, both in Sweden.

Examples of differing interpretations and other problems

The following are some examples of clear differences in interpretation between countries or of regions together with some more general problems.

Although the Interpretation Manual description for « 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) » clearly refers to the alliances *Arrhenatherion* and *Brachypodio-Centaureion nemoralis*, in the United Kingdom only NVC type MG4 *Alopecurus pratensis* – *Sanguisorba officinalis* grassland (included within *Cynosurion cristati*) is considered to be this habitat. Elsewhere in the E.U. a wider interpretation has been used, for example in Germany all associations belonging to the *Arrhenatherion* and *Brachypodio-Centaureion nemoralis* are included while in France 21 associations in the *Arrhenatherion elatioris* and the *Brachypodio rupestris-Centaureion nemoralis* are noted in Bensettiti (2001-2005).

Many countries have had problems with habitat « 6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas in Continental Europe) » and some further guidance was given by the ETC/NPB (a predecessor of the ETC/BD) in 2002 (ETC/NPB, 2002). In the drafts of annex I, there was no reference to « species rich », this was added at the request of the United Kingdom to avoid including grasslands dominated by *Nardus stricta* resulting from many years of overgrazing which are considered of little interest and which cover large areas of Scotland.

An European Commission note on habitat management (Galvnek & Jank, 2008) lists twelve alliances which the authors consider to be, at least partly, this habitat. Comparison with published interpretations by France, Germany and the United Kingdom show that there are marked differences, for example the alliance *Nardion strictae* is considered to be part of habitat 6230 in France but not in Germany (where it is considered part of « 6150 *Siliceous alpine and boreal grasslands ») while neither France or the United Kingdom include the *Nardo-Juncion squarrosi* but the EU guidance does. In the United Kingdom communities of the *Nardo-Juncion squarrosi* are considered to be of little conservation interest (Averis *et al.*, 2004). Galvnek and Jank (2008) also include the *Nardo-Caricion rigidae* which is considered to be 6150 in the United Kingdom.

Habitat 6230 is also problematic in Scandinavia where the distinction between 6230 and «6270 * Fennoscandian lowland species-rich dry to mesic grasslands » is not clear. The Interpretation Manual includes Palaeartic habitat type « 35.1 Atlantic closed acidophilous grasslands » as part of 6230 but defines 6270 as its subtypes « 35.1212 Fennoscandian boreo-nemoral *Agrostis-Festuca* grasslands » and « 35.1223 Northern boreal *Festuca* grasslands ». In Sweden it would probably be better to assume that 6230 is not present (Anders Jacobson, Swedish Species Information Centre, pers. com.) and this is probably also the case for Finland. Estonia has only proposed sites for 6270.

Sweden has proposed sites for « 6110 Rupicolous calcareous or basophilic grasslands of the *Alysso-Sedion albi* » although according to Dengler, Lbel & Boch (2006) the *Alysso-Sedion albi* does not occur in Scandinavia where that alliance is replaced by the *Tortello-Sedion*. Anders Jacobson (pers. com.) agrees that 6110 does not occur in Sweden and that the sites proposed should be considered « 6280 * Nordic alvar and Precambrian calcareous flatrocks ».

Sometimes there are differences between regional administrations in the same country, especially where nature conservation is a regional responsibility as in many federal countries. For example in Belgium, woodland with *Quercus* but without *Fagus sylvatica* can be considered to be « 9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) » in Flanders if the soil and herb layer correspond to this habitat whereas in Wallonia the presence of *F. sylvatica* is considered essential.

The Spanish proposals for « 7130 Blanket bog » also show differences between regional administrations with sites proposed by Galicia, Asturias and the Pais Vasco but not Cantabria although discussions at a bilateral meeting between the Spanish authorities, the European Commission in July 2003 and the ETC/NPB agreed the habitat was present, as later confirmed by the Spanish guide to the habitats of annex I (Barlomolé *et al.*, 2005).

Beechwoods are covered by 14 habitats in annex I and although the interpretation in central and western Europe poses relatively few problems this is not the case in south-east Europe. The beechwoods of south-east Europe were poorly known when CORINE was published, but all the beechwood habitats at level 4 in the CORINE classification were proposed by Noirfalise with the exception of « 41.19 Balkanic beech forests (*Fagion moesiacum*) » of northeastern Greece and his proposals were adopted for annex I.

When Greece made its first proposals for SCI they included several sites in northeast Greece for « 9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) » which is a beechwood which only occurs in the west of Europe (Fig. 1) but accepted this habitat was not present in Greece during a biogeogeographical seminar for the Mediterranean region. More recently the habitat « 91W0 Moesian beech forests » (equivalent to CORINE 41.19) was added to annex I in 2007 when Bulgaria joined the EU which possibly corresponds to the Greek

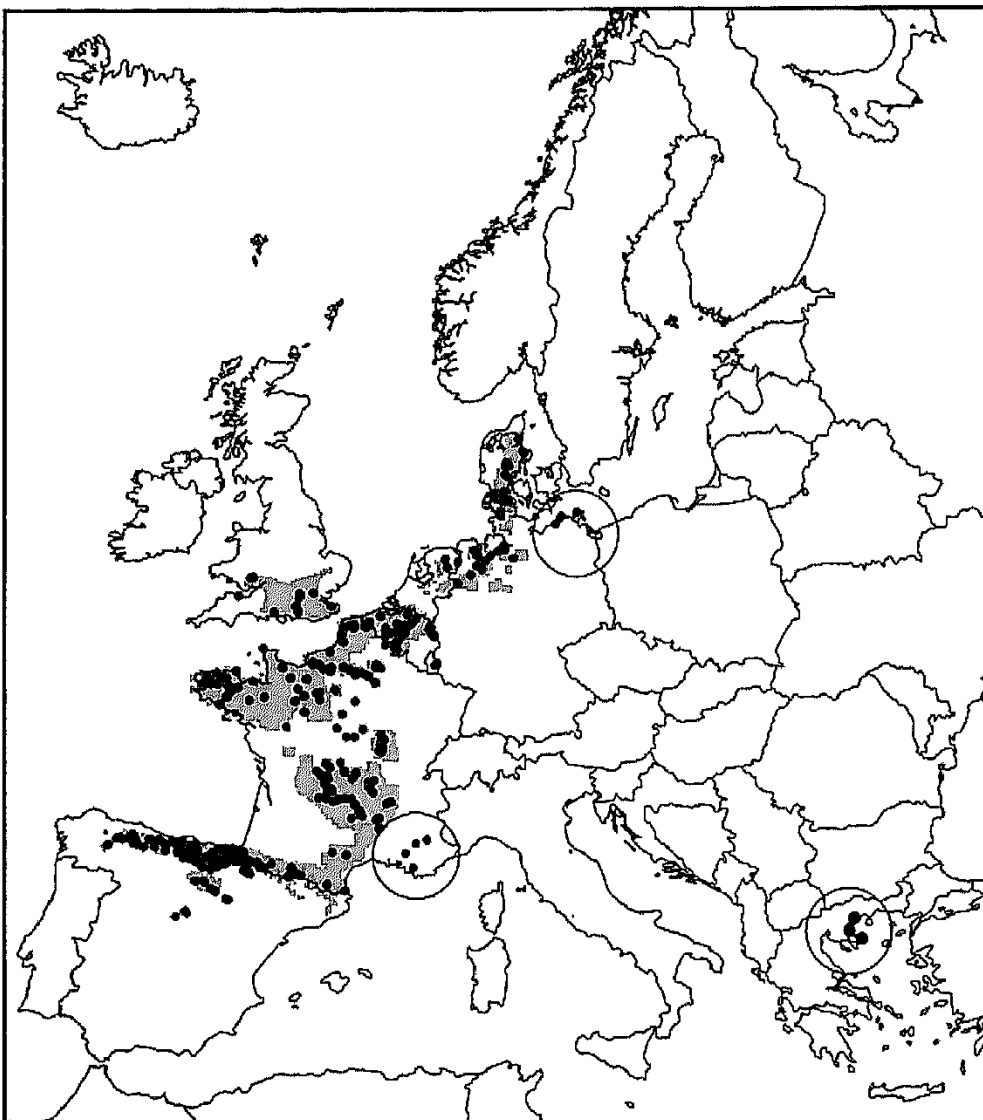


Fig. 1.- Distribution of sites proposed for habitat « 9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) » in 2003. Sites circled are no longer proposed for this habitat.

Fig. 1 – Distribution des sites proposés pour l'habitat « 9120 Hêtraies acidophiles atlantiques à sous-bois à *Ilex* et parfois à *Taxus* (*Quercion robori-petraeae* ou *Ilici-Fagenion*) » en 2003. Les sites encadrés ne sont plus proposés pour cet habitat.

stands formerly proposed as 9120. However, despite several recent syntaxonomic reviews of beechwoods in south east Europe (*e.g.* Bergmeier & Dimopoulos, 2001; Dzwongo & Loster, 2000; Tsiripidis *et al.*, 2007; Tzonev *et al.*, 2006), there is still no agreed treatment of beechwoods in south-east Europe, with disagreements between authors on the importance of phytogeographical factors, and a need for a wider regional or European synthesis of beechwoods (Panayotis Dimopoulos, pers com).

IV. FUTURE CHANGES

Any changes to annex I, both new habitats and changes to the names of existing habitats, requires a co-decision of the EU parliament and the Council of Ministers. Changes since 1992 have been included in the treaties of accession for new member state except for some of the new habitats proposed by Finland and Sweden which were added by a Council Directive (CEC, 1997). Modifications to descriptions in the Interpretation Manual only require the approval of the Habitats Committee.

Croatia, which is currently negotiating membership of the European Union, has proposed to add two new habitats to annex I — Sub-Mediterranean grasslands of the order *Trifolio-Hordeetalia*, Tufa cascades of karstic rivers — and to modify the description of « 8130 Western Mediterranean and thermophilous screes » so that it also includes Illyrian screes (Palaeartic code 61.15).

If Croatia joins the EU, a new edition of the Interpretation Manual will be required which will give an opportunity to make corrections to the existing text. If further countries, such as Iceland or Turkey join the EU it is likely that more habitats will be required as well as additional biogeographical regions.

There is no European « red list » of threatened habitats or plant communities but there are several for individual member states which can be used to identify possible important gaps in annex I. Petermann and Ssymank (2007) examined the coverage by annex I of the German redlist of threatened habitats and found that 70-80% were covered. Rodwell and Cooch (1997) evaluated rarity and degree of threat for all 285 plant communities (equivalent to associations) described by the British National Vegetation Classification. Twenty-six communities were assessed as '4' (rare) and nine as '5' (threatened) of which thirteen and three respectively were not assigned to an annex I habitat type.

Many of these communities appear to be covered by annex I and would be in other neighbouring countries such as France (Bensettiti, 2001-2005), however six are clearly not covered, three of these are communities of arable crops while the others are mires. It would be possible to examine other national redlists that are available (*e.g.* Austria, Bulgaria and Hungary) and identify habitats considered threatened and or rare across the EU.

The digital map of potential natural vegetation (Bohn *et al.*, 2000-2003) can be used to identify natural vegetation types which are rare. The map has its own typology of vegetation types but of the 36 mapping units with an area 100 km² or less, 22 are covered by annex I, three are partly covered and nine are not present in the EU27 leaving two mapping units present in the EU 27 but not clearly protected by the Habitats directive (G55 Balkanic mixed hop-hornbeam forests and G7 North Adriatic-Istrian sessile oak forests).

Many suggestions have been made for additional habitats and a selection is given in Table I. Some of these were proposed during the period 2000-2003 when the countries which joined the EU in 2004 were negotiating changes to the Annexes but were rejected by the existing member states (Evans, 2004).

Article 17 of the habitats directive requires member states to report on its implementation every six years. The national reports for 2001-2006 included assessments of the conservation status of each annex I habitat present in the country following an agreed methodology and the ETC/BD produced assessments for the biogeographical regions. Each habitat was evaluated as 'favourable', 'unfavourable-inadequate', 'unfavourable-bad' or 'unknown' (CEC, 2009; Sipkova *et al.*, in press).

There are seventeen habitats which have been assessed as 'favourable' in every biogeographical region in which they occur but the majority of these habitats occur only in Greece and Italy where data for the assessments was often only available from protected areas, rather than throughout their range as elsewhere in the EU. Even if these habitats are not threatened, they may still qualify as habitats of Community interest by being typical of their biogeographical region or by having a naturally small extent.

The European Commission has indicated that any revision should wait until the network based on the existing annexes is complete and the results of the Article 17 report for 2000-2006 have been fully analysed. For terrestrial habitats the network is close to completion for most member states although it is likely to be several years before the network can be considered to be complete for marine habitats and species (EEA, 2009). There is considerable reluctance to undertake a revision of the directive, with a worry that the directive would risk being weakened.

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Table I.- Some examples of habitats proposed as possible additions to annex I.

Tableau I.- Quelques exemples des habitats proposés comme additions possibles à l'annexe I.

Habitat	Proposed by
Wooded pastures & other traditional agro-forestry habitats (olive groves, orchards, etc)	Bergmeir (2008) Biondi <i>et al.</i> (2007)
Humid grasslands	Peterman & Ssymank (2007)
Reed and sedgebeds	Peterman & Ssymank (2007)
Subalpine <i>Alnus viridis</i> scrub	Evans (2006) Lasen (2006)
Swamp forests	Evans (2006) Peterman & Ssymank (2007)
Soft water springs	Proposed by Poland & Slovakia in 2000 Peterman & Ssymank (2007)

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